Memorandum

To: Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903

Date: March 15, 2019

Project #: 72900.00

From: Peter Pavao

Re: Reconstruction of the Pell Bridge Approaches Environmental Assessment – Wetlands and Waterways Technical Memorandum

1. Introduction

The Claiborne Pell Newport Bridge (Pell Bridge) carries State Route 138 between Jamestown and Newport and is the only road connection between Jamestown and Aquidneck Island. The Proposed Action of the Pell Bridge Interchange Project (Project) would provide direct connection from the northern part of the City to the downtown area, reduce queued vehicle traffic onto the Pell Bridge, reduce traffic in downtown Newport, and provide a portion of the bicycle and pedestrian facilities envisioned in the Aquidneck Island Transportation Study. The Proposed Action (Project) would occur in the City of Newport and Town of Middletown, Rhode Island. In accordance with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) is being developed to evaluate the impacts of construction and operation of the re-designed interchange on environmental resources.

This technical memorandum describes wetland and waterway resources within the Study Area for the proposed action. The discussion includes baseline conditions of wetlands and waterways, applicable regulations, analysis methodologies, and an assessment of the Project's impacts, followed by potential mitigation for these impacts.

2. Applicable Regulations and Criteria

Federal

The United States Army Corps of Engineers (USACE) has jurisdiction over Waters of the United States, which include waterways and adjacent wetlands, through §404 of the federal Clean Water Act (CWA). Wetlands and waterways within the Study Area are addressed in accordance with the following federal requirements:

- In compliance with Executive Order 11990 of 1977 (Protection of Wetlands), federal agencies are to avoid destruction and modification of, or construction within, existing wetlands where there is a practicable alternative. If a proposed project would impact existing wetlands, this order requires federal transportation agencies to make a finding that there is no practicable alternative. The Rhode Island Department of Transportation/Federal Highway Administration will consult with federal, state, and local agencies. The impact analysis for unavoidable impacts will be provided in the final Environmental Assessment and will include an opinion of the proposal's overall effect on the survival and quality of the wetlands.
- Section 401 of the CWA specifies additional requirements for permit review on the state level. Any applicant for a federal license or permit to conduct any activity that may result in a discharge into navigable waters must provide a certification from the state in which the discharge originates (401 Certification). Interstate water pollution control agencies having jurisdiction over navigable waters at the point where the discharge originates may issue a permit in lieu of the state. In Rhode Island, Water Quality Certification is obtained via application to the Rhode Island Department of Environmental Management (RIDEM) Office of Water Resources.

- Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States. The Section 404(b) (1) Guidelines state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have less of an adverse impact on the aquatic ecosystem or a special aquatic site, and requires that appropriate and practicable steps be taken to minimize potential adverse impacts on the aquatic ecosystem.

State

The State of Rhode Island has jurisdiction over freshwater wetlands and waterways promulgated under *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (Rules). The Freshwater Wetlands Act is administered by the Rhode Island Department of Environmental Management (RIDEM). The Coastal Resources Management Council (CRMC) has jurisdiction over coastal wetlands and replaces freshwater regulatory jurisdiction of the RIDEM in certain coastal areas under the *Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast* (Coastal Wetland Rules). Freshwater wetlands jurisdiction falls to the CRMC in the western portions of the Study Area (generally including areas west of the existing railbed) and to the RIDEM in the eastern parts of the Study Area (see Figure 1).

3. Study Area, Resource Definition, and Methodology

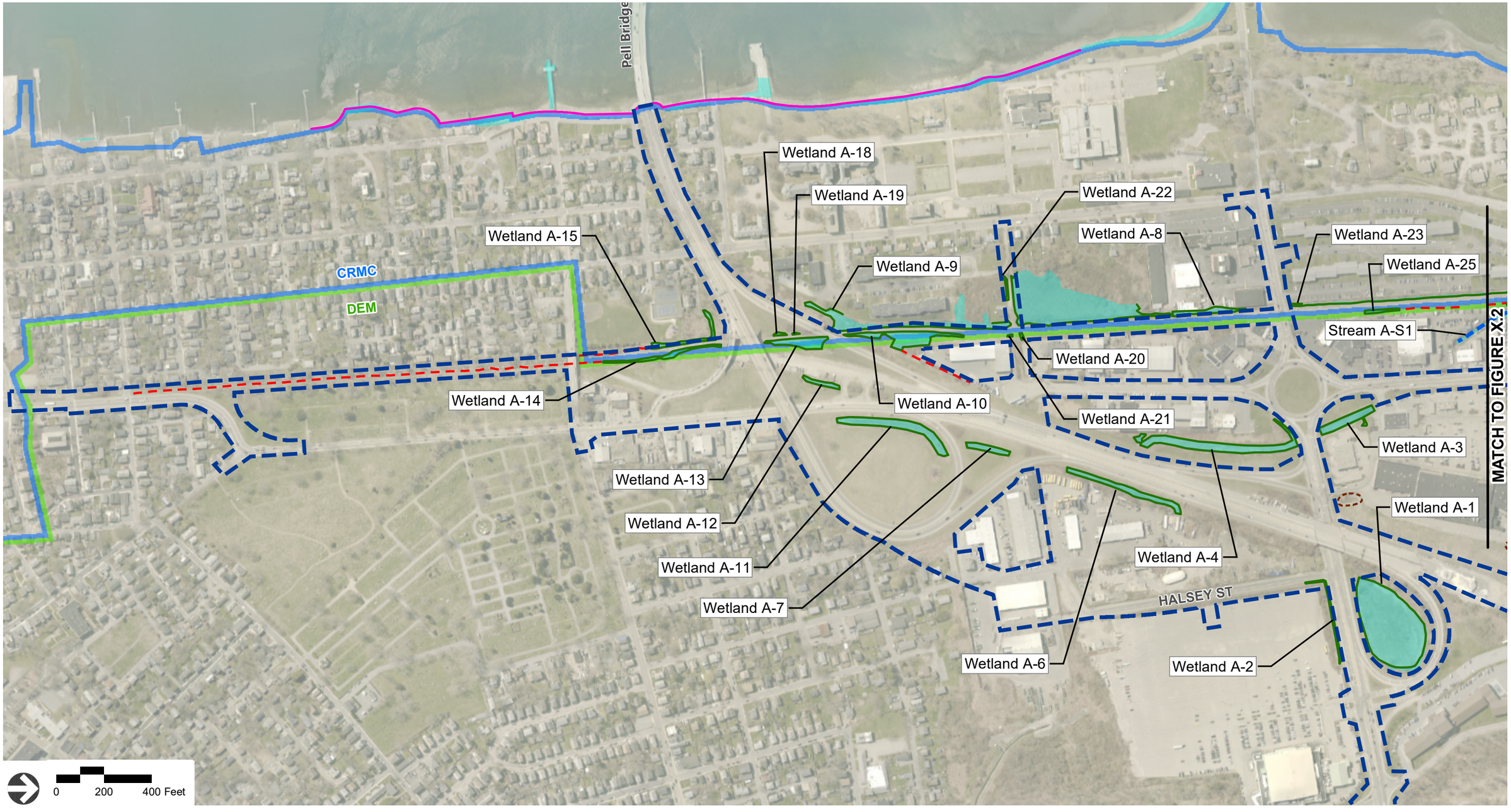
Study Area

The Project would be located on Aquidneck Island in Newport and Middletown, Rhode Island. Figure 1 shows the Study Area for wetlands and waterways, which includes 137 acres of an urbanized coastal watershed that drains into Narragansett Bay near Coasters Harbor Island. The Study Area extends from Bridge Street in Newport at the southern end to Coddington Highway in Middletown to the north. The western limits of the wetlands and waterways Study Area are located where the Pell Bridge ramps reach Aquidneck Island near Washington Street. The eastern limits are located near the intersection of Admiral Kalbfus Road and Girard Avenue in Newport, and the intersection of Coddington Highway and West Main Road in Middletown. The Study Area includes portions of Route 138, Admiral Kalbfus Road, JT Connell Highway, other connecting roads, and adjacent lands.

Wetland and Waterway Resource Definitions

Resources addressed in this technical memorandum include wetlands and waterways subject to federal jurisdiction as well as freshwater wetlands regulated by the state of Rhode Island. Some state-regulated wetland have jurisdictional limits that may extend beyond federal limits, as described later in this section. Coastal resources subject to the regulation of the CRMC and Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 1 percent annual chance floodplain (formerly referred to as the 100-year floodplain) are also located within the Study Area, but are addressed in separate technical memoranda devoted specifically to those resources.

Waters of the United States under federal jurisdiction of §404 of the federal Clean Water Act include all waters which are used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; and all other



Source: RIDOT, RIGIS, VHB 2017 & 2018 Field Investigation

Delineated Wetlands
- Delineated Wetland Edge
- Ditch/Area Subject to Storm Flowage
- Existing Coastal Feature
- Unnamed Stream Channel
- Existing Stormwater Feature

Wetlands Jurisdiction
- Rhode Island Coastal Resources Management Council (CRMC)
- Rhode Island Department of Environmental Management (DEM)

- Limit of Disturbance
- Wetland Area

Figure 1

Wetland Delineation Map 1

Reconstruction of the Pell Bridge Approaches
Newport, Rhode Island

waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, or drainage ditches leading to regulated Waters of the U.S., the degradation or destruction of which could affect interstate or foreign commerce (33 CFR Part 328).

Freshwater Wetlands regulated under the Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act (Rules) by the Rhode lsland Department of Environmental Management (RIDEM) include swamps, marshes, bogs, forested or shrub wetlands, emergent plant communities and other areas dominated by wetland vegetation and showing wetland hydrology, as summarized in Table 1.

Table 1: Freshwater Wetlands Regulated under the Rhode Island Freshwater Wetlands Act

Wetland Type	Characteristics	Size Requirement
Swamp	Dominated by woody species.	Three acres or larger.
Marsh	Dominated by emergent species.	One acre or larger.
Bog	Dominated by "bog" species and typically support sphagnum moss.	No minimum size criteria.
Emergent Plant Communities	Similar to marshes or wet meadows.	No minimum size criteria.
Forested and Shrub Wetlands	Similar to swamps.	Less than three acres.
Perimeter Wetlands	Area within 50 feet of a swamp, marsh, or bog.	Not affiliated with emergent communities less than one acre, or forested or shrub wetlands less than three acres.

In addition to the vegetated wetland communities identified in Table 1, the RIDEM regulates activities in and around waterways and open water bodies, including rivers, streams, ponds, Special Aquatic Sites, and Areas Subject to Storm Flowage (ASSF). The Rules also provide the authority to regulate Floodplains as Freshwater Wetlands; this topic is further addressed in the *Floodplains Technical Memorandum* and not discussed further in this memorandum.

Table 2: Waterways and Waterbodies Regulated by Rhode Island Department of Environmental Management

Waterway or Waterbody Type	Characteristics
River	Perennial stream depicted as a blue line on a United States Geological Survey (USGS) topographic map.
Streams and Intermittent Streams	Flowing bodies of water or watercourses other than rivers that flow during sufficient periods of the year to develop and maintain defined channels.
100-Foot Riverbank Wetland	Area within 100 feet of each bank of a river or stream that is less than 10 feet wide.
200-Foot Riverbank Wetland	Area within 200 feet of each bank of a river or stream that is greater than 10 feet wide.
Pond	Open standing or slow-moving water present for six or more months during the year and at least one-quarter acre in size. Ponds are assigned 50-foot Perimeter Wetlands.
Special Aquatic Sites	Smaller water bodies which do not merit a 50-foot Perimeter Wetland under the Rules.
Area Subject To Storm Flowage	Any body of flowing water, as identified by a scoured channel or change in vegetative composition or density that conveys storm runoff into or out of a wetland, but typically does not flow between storms.

Methodology

Baseline Conditions

Wetland and waterway resources within the Study Area were mapped and characterized to identify baseline conditions using a combination of field investigation and GIS mapping. Within the Study Area, wetlands were field delineated following the U.S. Army Corps of Engineers 1987 Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (version 2). Previously delineated wetland boundaries in the Study Area were reviewed and re-delineated as necessary during September 2017. Additional wetland delineations were completed in June and September 2018 to cover expansions of the Study Area. Wetland flag locations were recorded in the field using a Trimble® GPS unit capable of sub-meter accuracy, post processed, and transferred and incorporated onto project mapping. Where delineated wetlands extended onto private property, the wetland boundary was estimated using a combination of aerial photo interpretation and Rhode Island Geographic Information System (RIGIS) wetlands interpreted from 1988 aerial photography to one-quarter acre polygon resolution. Wetlands within the remainder of the Study Area were mapped using the RIGIS wetlands mapping.

Field notes were collected on soil, vegetation, and hydrologic conditions within delineated wetlands. Photographs and notes on conditions along the wetland boundary and interior were also collected. All wetlands within the Study Area were characterized following the wetland classification system developed by the U.S. Fish and Wildlife Service's (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States*. (This system is commonly referred to as the Cowardin classification system, after the name of its primary author.) The classification hierarchy begins with system, then subsystem, class, subclass, and finally, modifier.

Wetlands functions and values were assessed based on a descriptive, best professional judgement approach, with reference to the U.S. Army Corps of Engineers (USACE) New England District's *The Highway Methodology Workbook Supplement: Wetland Functions and Values - A Descriptive Approach*. This publication defines wetland functions and values, and provides a descriptive methodology for conducting evaluations. Functions are defined as *"self-sustaining properties of a wetland ecosystem that exist in the absence of society. Functions result from both living and non-living components of a specific wetland. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary production and nutrient cycling."* Values to society are defined as *"benefits that derive from either one or more functions and the physical characteristics associated with a wetland. The value of a particular wetland function, or combination thereof, is based on human judgment of the worth, merit, quality, or importance attributed to those functions. The proximity of development may alter wetland functions and values. Therefore, evaluation of the resource must consider not only the wetland, but also adjacent land use and associated interrelationships."*

Thirteen wetland functions and values are recognized under the USACE methodology. These eight functions and five values can be grouped into four general categories as provided below.

Biological Functions

- Fish and Shellfish Habitat – The effectiveness of seasonal and permanent water bodies and streams for providing fish and shellfish habitat. Water quality and physical characteristics of the stream, pond or lake are assessed.
- Wildlife Habitat – The suitability of the wetland to provide habitat for wetland dependent species. Wetland size, diversity of cover types, interspersion, and connectivity with other wildlife habitats are important factors contributing to wildlife cover, foraging, reproduction, and nursery habitat. Both resident and migrating species must be considered.
- Production Export (Nutrient) – The effectiveness of the wetland to produce food for ecosystem support.

Hydrological Functions

- Groundwater Recharge/Discharge –The potential for a wetland to serve as groundwater recharge and/or discharge area. Recharge evaluates the wetlands contribution to an aquifer. Discharge relates to the potential of the wetland to provide hydrologic support to downstream wetlands and water bodies by discharging groundwater to the surface.

› Flood Alteration– The wetland's ability to reduce downstream flooding. The wetland size, form (e.g., large level storage area with a restricted outlet), position in the watershed, and presence of a potential downstream damage area are evaluated.

Water Quality Functions

› Sediment/Toxicant/Pathogen Retention – The wetland's ability to remove pollutants (sediment, toxins, pathogens) from runoff entering surface waters. Potential upstream sources, the ability of the wetland to impound water to enhance sedimentation, and the wetland size are factors that are evaluated.

› Nutrient Removal/Retention/Transformation – The wetland's ability to attenuate nutrients in influent waters to minimize adverse effects on water bodies and aquifers.

› Sediment /Shoreline Stabilization – The wetland's ability to protect shorelines from wave erosion (especially streams, lakes and large ponds).

Societal Values

› Recreation – The wetland's suitability for swimming, boating, fishing, etc.

› Educational/Scientific Value – The wetland's value as an educational resource. Combines ecological integrity, proximity of schools and ease of access to assess educational opportunity. Also considered is the wetlands suitability for scientific study or research.

› Uniqueness/Heritage – The potential for former use of the wetland by Native Americans and historic industry and habitations, unique plants, animals, or geologic features.

› Visual Quality /Aesthetics – The visual and/or aural quality of the wetland. High values are associated with wetlands with multiple cover types and landforms in settings that are accessible to the public, yet removed from development.

› Threatened or Endangered Species Habitat – Special heritage values such as critical habitat or the presence of protected species or other intrinsic qualities.

The USACE Highway Methodology Workbook Supplement provides a list of considerations and qualifiers that were used to assess the occurrence of each function or value, followed by a subjective determination of Principal Functions and Values that are important physical components of a wetland ecosystem, or considered of special value or significance to society from a local, regional, or national perspective. The USACE Highway Methodology's list of considerations and qualifiers was applied to the function and values assessment. The degree to which a wetland provides each of the functions or values was determined by one or more of the following factors: landscape context, substrate, hydrology, vegetation, history of disturbance, and size. The determining factors that affect the level of function provided by a wetland can often be broken into two categories. The effectiveness of a wetland to provide a specified function is generally dependent on factors within the wetland, whereas the opportunity to provide a function is often influenced by the wetland's position in the landscape and adjacent land uses. For example, a large wetland depression with a restricted outlet may be considered highly effective in trapping sediment due to the long residence time of runoff water

in the system. If this wetland is in gently sloping woodland, however, there is no significant source of sediment in the runoff; therefore, the wetland is considered to have a small opportunity for providing this function.

Direct and Indirect Effects Analysis

Potential effects to wetlands and waterways were assessed by projecting the Project's limit of disturbance (LOD) over the wetlands and waterways Study Area base map. Impacts, such as filling, grading, clearing, or adjacent upland disturbance, were evaluated based on potential for direct effects to wetlands and waterways (i.e., effects within the LOD) and indirect effects (i.e., effects outside of the LOD). Impacts to wetlands and waterways resulting from redevelopment of decommissioned City and RIDOT land by others as a result of this project were considered in the analysis of indirect effects. Effects were further evaluated relative to duration, including temporary effects that would occur during the construction phase and permanent effects that would occur during the operations and maintenance phase.

The significance of various project effects was classified as minor, moderate, or major. *Minor effects* include those limited to the localized area of construction, and that do not affect or diminish the existence or use of wetlands in the Study Area in a measurable way. An example would be disturbance to an already developed Perimeter Wetland during construction. *Moderate effects* include those where wetlands are affected in a perceptible or measurable way, but not at a significant scale. Examples include indirect impacts such as temporary surface water drainage diversion during construction, temporary siltation releases during construction, and direct impacts such as temporary disturbance to wetlands (trenching and restoration), or small areas of permanent fill within wetlands or waterbodies. *Major effects* are measurable and significantly diminish wetlands and waterway resources such that they are lost or no longer available for use in the same capacity, and occur at a scale that changes the regional or global environment. An example would be a large-volume release of hazardous materials that migrates via existing surface water drainage networks to Narragansett Bay, creating significant impairment to estuarine wetlands, functions, values, and uses in the Narragansett Bay ecosystem. Identified effects to wetlands and waterways were further characterized as beneficial, adverse, or both.

Cumulative Effects Analysis

Cumulative effects include past, present, and reasonably foreseeable future actions, including federal and non-federal actions. The spatial boundaries for the cumulative effects analysis of the Study Area is defined by the area where wetland field delineations were completed. The temporal limits of the effects analysis span from 1939 to 2030. These dates were selected because 1939 is the earliest year that aerial photographs of the Study Area are available for estimating the historic extent of wetlands, and because 2030 is the current planning horizon for the Rhode Island Office of Statewide planning.

The extent of wetlands within the Study Area in 1939 was mapped using aerial photo interpretation. The acreage of wetlands in 1939 and present-day within the Study Area was calculated using GIS to assess cumulative wetland loss from 1939 through present-day. Changes in functions and values were also

estimated based on historic and present-day conditions using aerial photo interpretation and recently collected field data to establish baseline conditions. Future impacts and effects to wetlands within the Study Area was also estimated from present day to 2030. This was accomplished by considering the potential impact of:

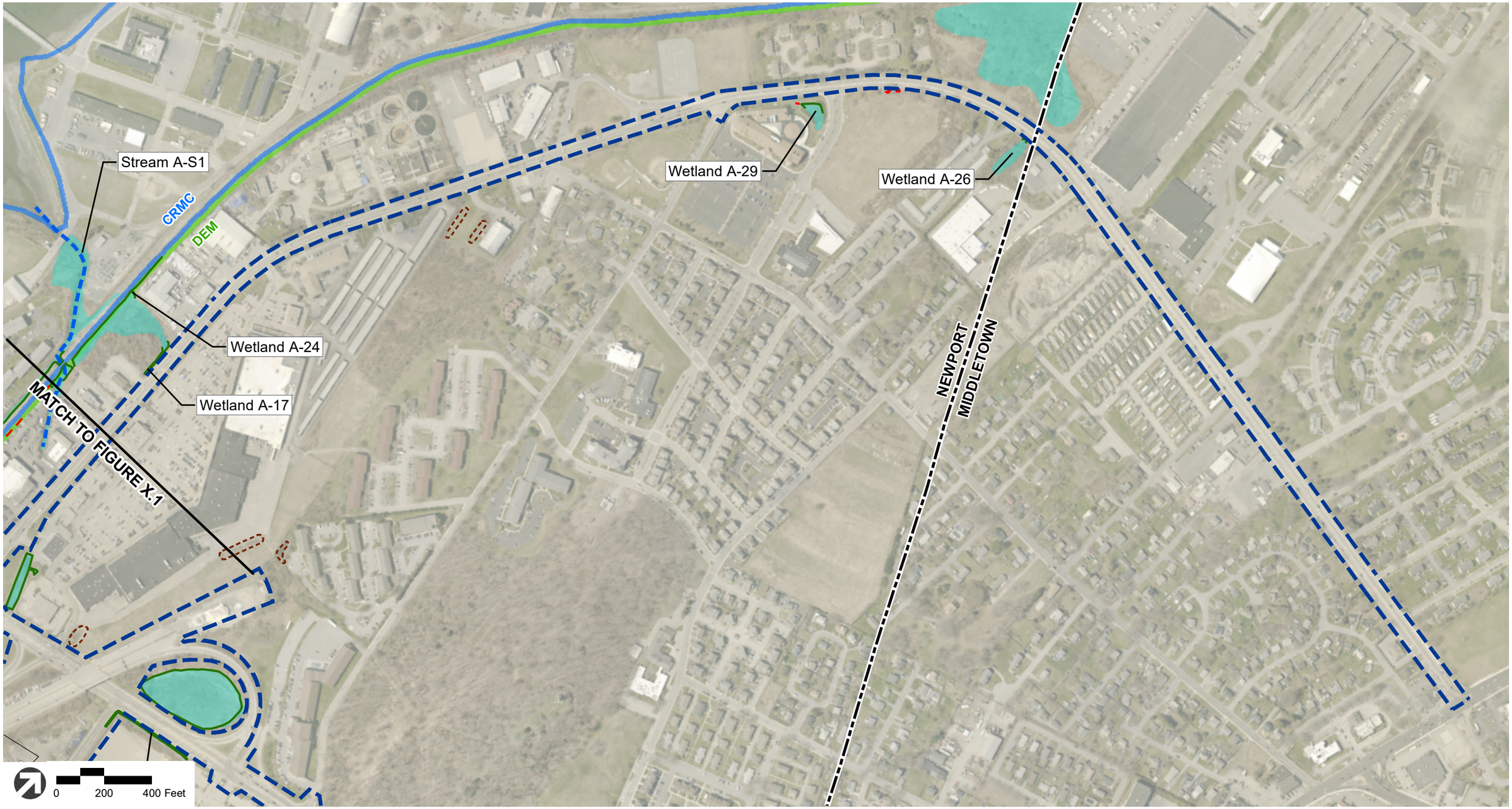
- The proposed Project transportation improvements (direct project impacts);
- The City of Newport's interest to redevelop the surrounding area of decommissioned transportation infrastructure land, City property, and excess Navy base property in the Study Area as an "innovation hub" of mixed office, commercial, and residential uses (indirect project impacts); and,
- Other reasonably foreseeable future actions within the Study Area that have the potential to affect wetlands.

The Project's LOD identified on Figure 2 includes the area of disturbance related to the Project transportation improvements. Potential indirect impacts to wetlands associated with the redevelopment of the decommissioned transportation infrastructure are more difficult to quantify due to the absence of a plan of development. These impacts are presumed to be minor relative to those associated with the transportation improvements and similar among alternatives. The effects of the proposed action on wetlands and waterways were compared to past and reasonably foreseeable future effects on wetlands and waterways in terms of acreage, functions and values, and significance following the same procedures described above for direct and indirect effects.

4. Impact Assessment

Baseline Conditions

VHB re-established the boundaries of previously delineated wetlands and field delineated a total of 25 wetlands and ASSFs, one man-made stormwater treatment wetland, and one stream, as shown on Figure 2. Additional features that were observed in the Study Area and shown on Figure 2 include five manmade stormwater management basins and one hardened estuarine shoreline coastal feature (CRMC Manmade Shoreline). Additional areas of estuarine and palustrine wetlands are also mapped in the project vicinity outside of the Study Area on Figures 1 and 2 based on RIGIS data. Table 3 summarizes the characteristics of wetlands, ASSFs, and the man-made stormwater treatment wetland within the Study Area, including their Cowardin classifications, acreage, dominant vegetation, functions and values, general features, and state and federal jurisdiction. Table 4 summarizes the attributes of the one stream delineated within the Study Area.



Source: RIDOT, RIGIS, VHB 2017 & 2018 Field Investigation

Delineated Wetlands
- Delineated Wetland Edge
- Ditch/Area Subject to Storm Flowage
- Unnamed Stream Channel
- Existing Stormwater Feature

Wetlands Jurisdiction
- Rhode Island Coastal Resources Management Council (CRMC)
- Rhode Island Department of Environmental Management (DEM)
- Wetland Area

Figure 2

Wetland Delineation Map 2

Reconstruction of the Pell Bridge Approaches
Newport, Rhode Island

Table 3: Pell Bridge - Wetland Summary Table[1]

Wetland Feature ID	Cowardin Classification[2]	Dominant Vegetation	Approximate Acreage	*Highway Methodology Functions and Values[3]	Comments / Notes	U.S. Army Corps/ Section 404 Clean Water Act Jurisdictional Feature[4]	Rhode Island Wetland Classification[4]
A-1	PEM5B/PSS1B	Common reed (*Phragmites australis*), Jewelweed (*Impatiens capensis*)	1.69	**STR**, **NR**, GW, WH	Palustrine emergent/ scrub-shrub system with saturated hydrolgy occupying the interior of the interchange loop. Drains to culvert under Admiral Kalbfus Road via iron-stained ditches along periphery of feature.	Yes	marsh
A-2	PEM5B	Common reed (*Phragmites australis*)	0.06	STR, NR	Emergent wetland roadside ditch with saturated hydrology.	Yes	ASSF/ emergent wetland ditch
A-3	PEM5F	Common reed (*Phragmites australis*)	0.19	**STR**, **NR**, GW, FF	Emergent wetland ditch with saturated to semipermanently flooded hydrology. Potentially a portion of an historically realigned stream or agricultural ditch. Approximately 6-12" of surface water present in ditch.	Yes	emergent wetland ditch
A-4	PEM5E	Common reed (*Phragmites australis*)	0.53	**STR**, **NR**, FF, GW, WH	A manmade emergent swale with saturated to seasonally flooded hydrology containing a semi-permanently flooded ditch. Located between fill and grading for highway ramp and commercial land. Approximately 6" of surface water present. Potentially part of an historically realigned stream or agricultural ditch.	Yes	emergent wetland ditch
A-6	PEM5E	Common reed (*Phragmites australis*), Hedge false bindweed (*Calystegia speium*)	0.25	**STR**, **NR**, FF, GW, WH	A manmade or altered swale with saturated to seasonally flooded hydrology. Potentially part of an historically realigned stream or agricultural ditch. Approximately 6" of surface water present. Located between fill and grading for highway ramp and commercial land.	Yes	emergent wetland ditch
A-7	PEM5E	Common reed (*Phragmites australis*)	0.1	**STR**, **NR**, FF	Constructed highway drainage swale with seasonally flooded to saturated hydrology. Approximately 12" of surface water present in ditch. Located in the median between highway ramps.	Yes	emergent wetland ditch
A-8	PEM5E	Common reed (*Phragmites australis*)	1.85	**NR**, STR, FF, GW, WH	Large marsh with saturated hydrology. Estimated 2' of water in ditches that extend along the existing railroad bed.	Yes	marsh
A-9	PEM5E	Common reed (*Phramites australis*)	0.63	**STR**, **NR**, FF, GW, WH	Remnant wetlands located in swale between existing filled and developed land, with saturated to seasonally flooded hydrology. Partially located along railroad ditch with surface water, holding 6"-12" of water in spots.	Yes	emergent wetland
A-10	PSS1B/PEM5B	Common reed (*Phragmites australis*), Black locust (*Robina pseudoacacia*)	0.34	STR, NR, GW, WH	Disturbed area with saturated and compacted soils, fill, and ditching between railroad right-of-way, highway ramp, and commercial land. Receives drainage from nearby ditch.	Yes	emergent wetland with contiguous ASSF
A-11	PEM5E	Common reed (*Phragmites australis*)	0.38	**STR**, **NR**, FF	Constructed highway drainage swale with saturated to seasonally flooded hydrology. Approximately 12" -24" of surface water present in ditch. Located in the median between highway ramps.	Yes	emergent wetland ditch
A-12	PEM5E	Common reed (*Phragmites australis*)	0.06	STR, NR, FF	Man made drainage swale located within the highway interchange with saturated to seasonally flooded hydrology. Standing water present in ditch.	Yes	emergent wetland ditch
A-13	PEM5E	Common reed (*Phragmites australis*)	0.18	NR, STR, FF	Man made drainage swale with saturated hydrology/surface water. Approximately 12" of surface water present. Located within the railroad right-of-way.	Yes	emergent wetland ditch
A-14	PEM5E	Common reed (*Phragmites australis*), jewelweed (*Impatiens capensis*), gill-over-the-ground (*Glechoma hederacea*), and multiflora rose (*Rosa multiflora*).	0.11	NR, STR, FF, WH	Railroad ditch with saturated to seasonally flooded hydrology, with areas containing some surface water. Approximately 15" of surface water present in center of ditch at some locations. Previously contiguous to larger wetland system that was filled/no longer exists. Mowed and maintained by excavation. Uvegetated in some segments. Rabbit observed in undergrowth adjacent to wetland on rail embankment.	Yes	emergent wetland ditch with contiguous ASSF
A-15	PEM5E	Common reed (*Phragmites australis*)	0.12	NR, STR, FF	Railroad ditch with saturated hydrology/surface water. Located within the railroad right-of-way.	Yes	emergent wetland ditch with contiguous ASSF
A-17/28	PSS5E	Common reed (*Phragmites australis*), jewelweed (*Impatiens capensis*), black nightshade (*Solanum nigrum*), multiflora rose (*Rosa multiflora*), indigo bush (*Amorpha fruitcosa*), and Bebb's willow (Salix bebbiana).	0.91	**STR**, **NR**, FF, GW, WH	Delineated components include steep sided narrow man-made ditch adjacent to road with saturated hydrology, that drains into a shrub-dominated wetland on the abutting lot that drains towards Coasters Harbor. A tree canopy exists west of the road ROW where Bebb's willow exceeds 20 feet in height and red maple is co-dominant.	Yes	shrub wetland with contiguous ASSF
A-18	PEM1E	Yellow nutsedge (Cyperus esculentus), Canada rush (*Juncus canadensis*)	0.01	STR, NR	Man made, mowed drainage swale along rail bed. Saturated to 2" of water.	No	ASSF
A-19	PEM1B	Yellow nutsedge (*Cyperus esculentus*), Common reed (*Phragmites australis*)	0.003	STR, NR	Small, mowed manmade swale along rail bed. Saturated hydroperiod.	No	ASSF
A-20	PEM5F	Common reed (*Phragmites australis*)	0.01	STR, NR	Man made drainage ditch in railroad right-of-way with semi-permanently flooded hydrology. The ditch holds 2'+ of water.	No	ASSF
A--21	PEM1E	Yellow nutsedge (*Cyperus esculentus*), Common reed (*Phragmites australis*)	0.003	STR, NR	Man made ditch in railroad right-of-way with seasonally flooded to saturated hydrology, holding approximately 3" of water at the ditch center.	No	ASSF
A-22	PEM5E	Common reed (*Phragmites australis*)	0.02	STR, NR	Small ditch between existing gravel road and abutting undeveloped lot. No standing water obeserved. Evidence of hydrology observed with water stained leaves.	No	ASSF
A-23	PEM5E	Common reed (*Phragmites australis*)	1.43	**STR**, **NR**, FF, GW, WH	Riparian emergent wetland with seasonally flooded to saturated hydrology located on both sides of the railroad right-of-way. Includes railroad ditch on west side of railroad.	Yes	marsh with contiguous ASSF
A-24	PEM1E	Smartweed (*Polygonum sp.)*	0.91	STR, NR	Small railroad ditch/emergent wetland with seasonally flooded to saturated hydrology.and rail road ditch/ emergent wetland with saturated hydrology. Phragmites dominated emergent wetland extends offsite onto abutting lot.	Yes	emergent wetland with contiguous ASSF
A-25	PEM1E	Smartweed (*Polygonum sp.)*	0.04	STR, NR	Small railroad ditch/emergent wetland with seasonally flooded to saturated hydrology.	No	ASSF
A-26	PFO1E	Red maple (*Acer rubrum*), Bebb's willow (*Salix bebbiana*), sweet pepperbush (*Clethra alnifolia*), winterberry (*Ilex verticillata*), multiflora rose (*Rosa multiflora*), and porcelain berry (*Ampelopsis brevipedunculata*).	0.2	**STR**, **NR**, FF, GW, WH	Primarily offsite forested wetland within property fence. Only the outlet swale to the wetland was delineated within the road ROW, which drains to a road culvert. The outlet swale is scoured and devoid of vegetation.	Yes	forested wetland
A-29	PSS1E	Silky dogwood (*Swida amomum*), Viburnum cultivar (*Viburnum sp. cf.lantana*), common reed (*Phragmites australis*), and black nightshade (*Solanum nigrum*).	0.11	STR, NR, FF	Stormwater treatment wetland north of the driveway entrance to Rhode Island Community College Campus from JT Connell Highway. This is a Low Impact Development (LID) feature constructed in uplands, and that is fed by runoff generated within the campus. This stormwater feature is not likely jurisdictional under state or federal regulations, but meets the technical criteria for wetlands.	No, Stormwater feature	No, stormwater feature

[1] All wetlands field-delineated per the Corps' 1987 Wetland Delineation Manual and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and Northcentral Region (2012).

[2] Classification follows Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitat of the United States. U.S. Fish and Wildlife Service. FWS/OBD-79/31. 103pp.

[3] USACE. 1999. U.S. Army Corps of Engineers - New England District. 1999. The Highway Methodology Workbook: Supplement: Wetland Functions and Values - A Descriptive Approach. NAEEP-360-1-30a.
GW = Groundwater Recharge/Discharge; FF = Floodflow Alteration; FH = Fish and Shellfish Habitat; STR = Sediment/Toxicant Retention; NR = Nutrient Removal/Retention/Transformation; PE = Production Export;
SS = Sediment/Shoreline Stabilization; WH = Wildlife Habitat; REC = Recreation; EDV = Educational/Scientific Value; UH = Uniqueness/Heritage; AES = Visual Quality/Aesthetics; ES = Endangered Species
*Bold and underlined font denotes principal function or value for the wetland resource. Other listed functions and values provided at a lower or very limited level.

[4] Five manmade stormwater management features identified on the site plans are not included in this table because they do not constitute regulated wetlands.

Table 4: Pell Bridge - Stream Summary Table									
Stream Feature ID	**Stream Name**	**Cowardin Classification**	**Flow Regime**	**Associated Wetland**	**Typical Channel Width (ft)**	**Substrate**	**Centerline (CL) or Top of Bank (TOB) Delineation**	**U.S. Army Corps/ Clean Water Act Section 404 Jurisdictional Feature**	**Rhode Island Wetland Classification**
A-S1	Direct Tributary to Narragansett Bay	R2UB1	Perennial	A-23	8-10, estimated	Gravel, Cobble	CL	Yes	Stream

Wetlands

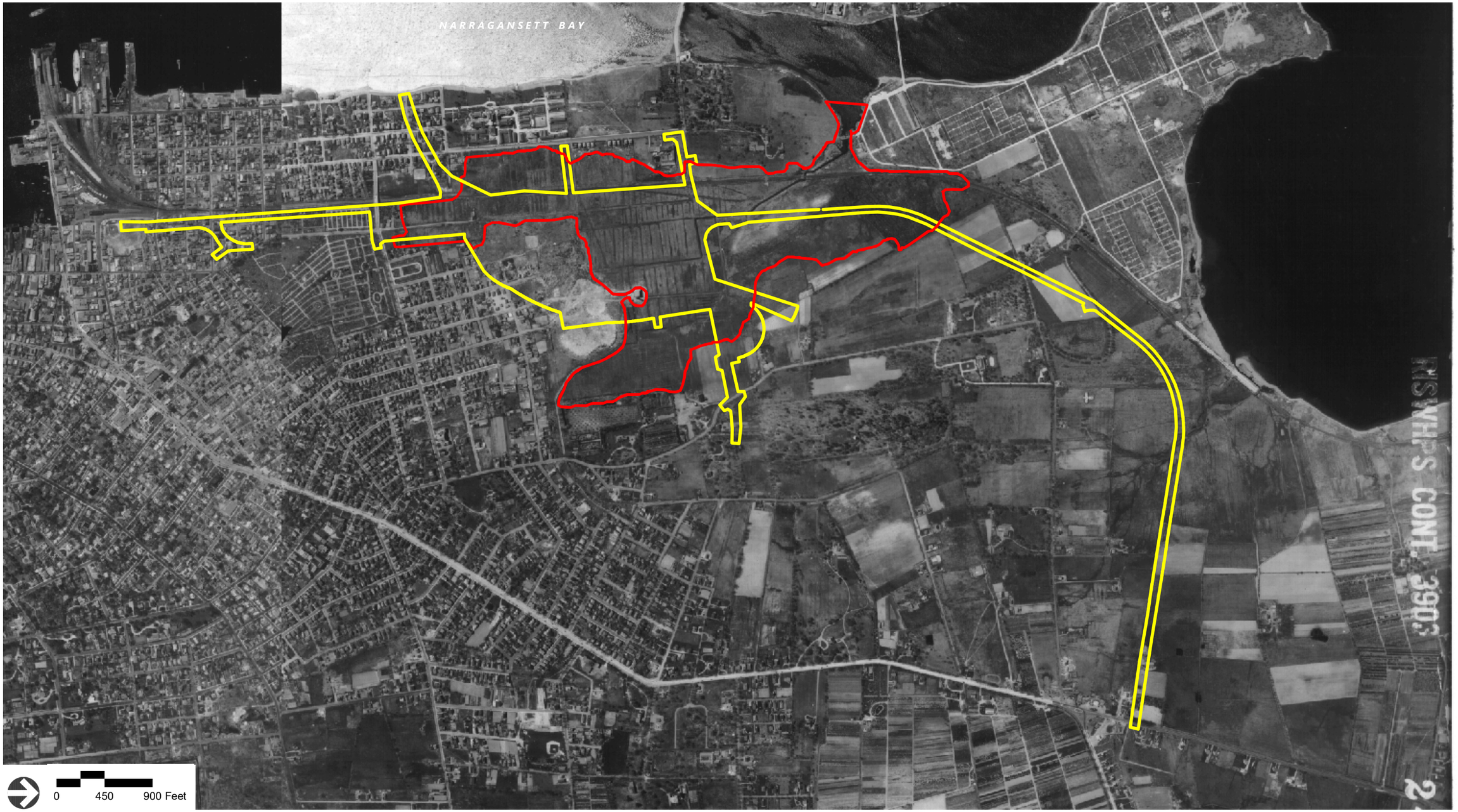
Wetlands identified in the Study Area belong to the non-tidal Palustrine system of the Cowardin classification method (Federal Geographic Data Committee, 2013). Estuarine wetlands occur outside of the Study Area along the shoreline of Narragansett Bay. Palustrine systems are terrestrial and extend into areas inundated by less than six feet of water for at least part of the year. Areas with greater water depths are classified as deep-water habitats, which are absent within the Study Area. There are no subsystems recognized in the palustrine system. The three common classes are forested wetlands (PFO), scrub-shrub wetlands (PSS), and wetlands dominated by emergent plants (PEM). Twenty-one of the palustrine wetlands in the Study Area are of the PEM class. Sixteen of these belong to the *Phragmites australis* subclass, and five belong to the persistent emergent subclass, meaning that dead vegetation remains standing until the next growing season. Two of the emergent wetlands are classified as a mixed class with PSS broad-leaved deciduous components, two wetlands are classified as PSS broad-leaved deciduous, and one is classified as PFO broad-leaved deciduous. Dominant vegetation and other characteristics of individual wetland features are identified in Table 1.

Wetland soils within the Study Area generally consist of graded, excavated, or previously disturbed materials derived from glacial till or fill materials. However, native, organic wetland soils are present within some wetlands that are remnants of historically larger wetland areas (such as Wetland A-8). Historic aerial photography from 1939 indicates that most of the Study Area was previously emergent wetlands or wetlands that had been cleared for agricultural purposes and ditched to improve drainage (see Figure 3). Subsequent urban development has resulted in conversion of most of this former wetland area to developed urban land. Where wetlands remain within the Study Area, most are constructed linear ditches populated with invasive plant species. These wetlands function as drainage swales, or remnants of formerly more extensive wetlands. The hydrology of most of the wetlands within the Study Area is classified as saturated or seasonally flooded. Some of the excavated ditches within Study Area wetlands may be semi-permanently flooded.

Waterways

Wetlands contained within channels that are not dominated by trees, shrubs, or persistent emergent vegetation belong to the Riverine system of the Cowardin classification method. The one unnamed riverine wetland (A-S1) identified in the Study Area includes a lower perennial stream where the gradient is low and water velocity is slow, with an unconsolidated bottom of cobble and gravel. Existing site conditions and review of historic aerial photographs demonstrate the stream has been extensively ditched, culverted, and altered. The 1939 aerial photography (see Figure 3) shows the stream had either been ditched and straightened by that time or was created as a ditch for agricultural drainage purposes.

Stream A-S1 is not on the state's May 2015 303(d) List of Impaired Waters, and meets RIDEM Water Quality Standard B. Currently, the stream begins at a culvert outfall located approximately 350 feet southeast of the existing railroad bed crossing vicinity where the stream was delineated. The channel is approximately eight to ten feet wide, has been ditched and straightened, and drains to the northwest directly into Narragansett Bay approximately 420 feet from the existing railroad bed crossing. In hydrologically up-gradient areas of the



Source: RIDOT, RIGIS 1939 Digital Aerial Photography

Legend

- Wetland and Waterways Study Area Boundary
- Estimated Extent of Wetlands, 1939

Figure 3

Estimated Historical Extent of Wetlands and Waterways (1939)

Reconstruction of the Pell Bridge Approaches
Newport, Rhode Island

watershed, Wetlands A-3, A-4, A-6, A-7, and A-11 contain stagnant ditches that may have been part of the same original drainageway, based on review of 1939 aerial photographs. Under present-day conditions, these ditches probably drain to the existing stream channel via subsurface culverts.

Wetland Functions and Values

Functions and values of wetlands within the Study Area are identified in Table 3. Principal functions provided by wetlands within the Study Area are limited to water quality functions, including sediment and toxicant retention and nutrient removal and transformation. Runoff from the urbanized impervious surfaces within the Study Area typically contains high concentrations of sediment, toxicants, and nutrients. The stagnant ditch character of many of the Study Area wetlands provides a sink for runoff and the potential to attenuate these pollutants through sediment trapping, nutrient uptake by plants, and toxicant transformation through microbial processes.

Other wetland functions that are provided at a lower level in the Study Area include flood flow alteration, groundwater discharge/ recharge, and wildlife habitat. Many of the wetland ditches in the Study Area have constricted culverted outlets, allowing them to collect and temporarily hold surface runoff and provide some flood flow alteration functions. Such functions are limited, however, by the small area of the wetlands and their limited capacity to store runoff. Wetlands in the Study Area also intersect with the saturated zone of the subsoil, but the extent to which significant groundwater discharge or recharge occurs is limited by the small size of the wetlands and the dense till substrates that function as an impermeable layer or aquitard. Wildlife habitat functions are provided at a low level because most of the wetland habitats are dominated by *Phragmites australis* and other invasive species that provide limited habitat value. Study Area wetlands do have the potential to support small mammals and birds that live in urban settings, as well as insects, small amphibians, and reptiles tolerant of disturbed environments.

Effects Analysis

Direct Effects

Approximately 0.85 acres of wetlands and ASSFs are located within the Project's limits of disturbance (LOD) and would be directly affected by project construction and operation (see Figure 2). Direct, permanent adverse effects to wetlands include fill, grading, grubbing (soil disturbance), and vegetation clearing; all wetlands within the LOD are assumed to be permanently removed. These effects would commence during the construction phase and persist through project operations. Project construction and operation would have no direct effects to the one perennial stream identified within the Study Area.

Direct effects to wetlands would result in the loss of 0.85 acres of mostly previously disturbed and altered wetlands under the jurisdiction of the USACE and RIDEM, the loss of principal functions including sediment/ toxicant retention and nutrient removal/ retention/ transformation, and the loss of other non-principal functions including groundwater discharge/ recharge, flood flow alteration, and wildlife habitat. An unquantified additional impact to wetland may result from the redevelopment of lands made available by

removal of the existing ramps. The area impacted is anticipated to be minor in comparison to the transportation improvements. Safe roadways are designed within specific geometric constraints that limit the ability to avoid wetland impacts. Future development would have to conform to state and federal wetland regulatory requirements. Only unavoidable impacts are permissible under these regulatory systems, so it is assumed that potential impacts would be avoided and minimized to the extent practicable, and that adverse impacts resulting from redevelopment of land made available by the Project would be minor. Redevelopment of commercial or office space will be appropriately scaled and sited to avoid significant wetland impact.

While not a federal resource, an additional 2.2 acres of mostly developed 50-foot Perimeter Wetland associated with Wetlands A-1 and A-8 regulated under Rhode Island's Freshwater Wetlands Act would also be affected by construction and operation of the Project. It is anticipated that parts of the Perimeter Wetland associated with Wetland 1 may be impacted by redevelopment after the existing ramps are removed. Most of this Perimeter Wetland is presently paved, and the redevelopment could include the revegetation of a portion of this state resource that would improve upon the existing condition.

Indirect Effects

The Project's indirect effects to wetlands include:

- Impacts to wetlands on RIDOT and City of Newport property located outside of LOD that would be decommissioned, sold, and redeveloped by others in the future;
- Sedimentation in wetlands adjacent to the project LOD;
- Project construction and operation within unregulated adjacent uplands;
- Temporary disturbance to wetland wildlife habitat functions adjacent to the LOD; and,
- The potential for hydrologic modifications to wetlands adjacent to the LOD.

Wetland or waterway impacts that result from redevelopment of decommissioned RIDOT and City of Newport land by others that is made available by the Project constitutes an indirect project effect to wetlands or waterways.

Indirect, temporary, and adverse effects to wetlands adjacent to the Project LOD could also occur during project construction as a result of sedimentation when adjacent upland soils are disturbed. These temporary effects are considered minor because the wetland areas that may be affected by sedimentation are small, and erosion and sedimentation will be managed using Best Management Practices (BMPs) during construction (see discussion of mitigation in Section 6, below) in accordance with applicable state and federal regulations.

Unregulated adjacent uplands (i.e., those associated with wetlands not classified as bogs, swamps, or marshes under Rhode Island state law) within the LOD will be permanently affected by excavation, fill, grading, vegetation removal, and redevelopment. The affected adjacent uplands have previously been developed or disturbed by construction within the Study Area, so effects will be minor because there will be no new development of intact, undeveloped adjacent uplands.

Wildlife inhabiting wetlands adjacent to the LOD and construction area may also be temporarily disturbed by project construction noise and activities. However, project construction would occur in an area that is already intensely developed with busy roadways and significant noise, so any indirect, adverse construction-phase effects to adjacent wetland wildlife habitat would be temporary and minor.

Recontouring of the land and modification of impervious surface coverage may result in changes to surface runoff or groundwater hydrology with the potential to affect the hydrology of wetlands adjacent to the LOD. These permanent, indirect hydrologic effects to adjacent wetlands are expected to be minor, given the current highly developed landscape context.

No Action Alternative

Under the No Action Alternative, there would be no demolition or construction of transportation infrastructure, divesting of RIDOT or City of Newport land, and direct or indirect effects to wetlands and waterways would be avoided. However, the No Action Alternative would not meet the Project Purpose and Need.

5. Cumulative Impacts

Cumulative effects to wetlands include past, present, and reasonably foreseeable future actions, including federal and non-federal actions, that could affect wetland acreage, functions, or values. Based on review of georeferenced aerial photographs from 1939 available through RIGIS, an estimated 63 acres of the Study Area was wetland in 1939 (see Figure 3). The 1939 photographs exhibit a network of surface ditching through wetlands that resembled salt marsh, freshwater marsh, wetland pasture, or hayfield ditched for surface water management and drainage purposes. The one stream delineated in the Study Area during 2017 was already ditched and straightened on the 1939 aerial photographs. It extended further south and east into the Study Area than present day conditions. The wetlands were abutted by a mix of developed urban land, an apparent landfill, and upland agricultural fields in 1939.

Wetland field investigations completed in 2017 and 2018 in the Study Area revealed that wetlands currently constitute approximately 6.6 acres of the Study Area. This means that approximately 56.4 acres of wetlands, along with their associated functions and values, were lost between 1939 and 2018. This loss constitutes approximately 90 percent of the estimated 63 acres of wetlands that existed in the Study Area in 1939, and losses of the following assumed functions and values based on evaluation of the historic aerial photography and present-day site conditions:

- Wildlife habitat;
- Production export;
- Groundwater discharge/ recharge;
- Flood flow alteration;
- Sediment/ toxicant/ pathogen retention; and,
- Nutrient removal/ retention/ transformation.

The proposed project would result in permanent, direct effects to an approximate 0.85 acres of additional wetlands, which is approximately one percent of the Study Area's estimated 1939 wetland acreage of 63 acres, and 13 percent of the 6.6 acres of wetlands that presently exist. Approximately 2.2 acres of additional previously developed Perimeter Wetlands only regulated by the state would also be permanently affected. Of the original estimated 63 acres of wetlands located within the Study Area, approximately 5.8 acres (nine percent) would remain following construction of the Project. These moderate impacts account for direct effects related to the proposed project construction of bridge, highway, bike-ped, and other transportation improvements intended to meet the project purpose and need. Additional indirect wetland and waterway impacts related to future in-fill development on land made available by construction and operation of the Project may include construction-phase erosion and sedimentation, redevelopment of adjacent uplands, construction-phase disturbance to wildlife habitat functions, and modifications to watershed drainage and runoff. These impacts are not quantified, although it is assumed that indirect impacts would be minimized and limited in area in accordance with state and Federal regulations and BMP guidance, and therefore would be minor.

Other reasonably foreseeable future actions that could affect the existing 6.6 acres of Study Area wetlands and their, functions, or values by 2030 include other development and land alterations that could have direct, adverse effects on wetlands or waterways by fill, grading, or vegetation removal, or indirect adverse effects through development of adjacent uplands, sedimentation, or stormwater and hydrologic modifications. The existing state and federal wetland regulatory systems require that impacts to wetlands and waterways be avoided and minimized to the extent practicable before they can be permitted. Stormwater management and construction phase BMP's provide measures for managing and mitigating stormwater and erosion and sedimentation effects related to construction and post-construction runoff. Therefore, adverse direct and indirect effects of other reasonably foreseeable future actions are anticipated to be minor.

6. Mitigation

No specific mitigation plans have been developed at this stage of the Project to offset permanent effects to wetlands and waterways. The urbanized site context and the prevalence of wetlands dominated by invasive species (common reed in particular) presents a management challenge for on-site compensatory mitigation by creation, restoration, or enhancement of wetland acreage. Elimination and management of common reed and other invasive species from wetlands is often not successful once they are pervasively established and requires long-term management commitments that are difficult to implement and fund. The intensely developed site context is also space-constrained and not conducive to re-establishment of effective upland buffers or landscape connectivity needed to create, restore, or enhance wetland functions such as wildlife habitat.

However, the potential does exist for restoration of wetlands at an historically filled site on the west side of J.T. Connell Highway including an abandoned restaurant property and adjacent mostly wetland undeveloped property (Wetland A-24). This site presents an opportunity for fill removal and restoration of a buried wetlands. While the constraints discussed above do exist at this property, it may be possible to restore wetland acreage and some of the principal water quality functions lost by Project construction and operation.

Mitigation may also be achieved through implementation of onsite post-construction stormwater management BMPs to further offset the loss of principal water quality maintenance wetland functions, including sediment/ toxicant retention and nutrient removal/ retention/ transformation. The loss of wetland acreage and non-principal functions including groundwater discharge/ recharge, flood flow alteration, and wildlife habitat, could also be addressed through offsite mitigation at appropriate locations where there is a high likelihood for success, habitat connectivity, and effective upland buffering. This could potentially be achieved through a permittee-sponsored mitigation project including restoration of degraded or filled wetlands, enhancement of existing wetlands, preservation of wetlands and upland buffers, or creation of wetland acreage. Mitigation of temporary construction-phase effects related to sedimentation within wetlands and waterways would be achieved through implementation of construction BMPs to control erosion.

Restoration and daylighting sections of the ditched and culverted stream that historically ran through the Study Area to restore stream ecology is an additional potential mitigation option. Currently, this drainage outlets into the delineated stream segment in the Study Area that drains into Coaster's Harbor. Stream channel restoration and daylighting may be best suited as a potential mitigation option for wetland and waterway impacts related to future redevelopment of land divested by RIDOT and the City of Newport that will be implemented by others. The restored stream could become an attractive and functional landscape feature within the future redevelopment areas.

7. Regulatory Coordination and Required Permits

Authorization for Project impacts to wetlands and waterways that are protected under Section 404(b) of the federal Clean Water Act will require Pre-Construction Notification under the USACE's State of Rhode Island General Permit 18 because total project impacts to federally regulated wetlands and waterways would exceed 5,000 square feet in area. Agency coordination and consultation will be required with the U.S. Fish and Wildlife Service, the Coastal Resources Management Council, the Rhode Island Historical Preservation & Heritage Commission, and the Narragansett Tribe. Federal Water Quality Certification under Section 401 of the Clean Water Act will also need to be obtained through application to the RIDEM Office of Water Resources, which has been delegated authority to issue Clean Water Act Water Quality Certifications.

Impacts to state-protected Freshwater Wetlands for Project impacts will require authorization from the Rhode Island Department of Environmental Management or the Rhode Island Coastal Resources Management Council. As a linear project located on both sides of the CRMC and RIDEM jurisdictional boundary (see Figures 1 and 2), the RIDEM and CRMC shall jointly determine which agency will serve as the freshwater wetland review agency for the Project. This determination will be issued by CRMC within 10 days of receiving a written request from the applicant for a determination of wetland review jurisdiction. Depending on which agency is established as the Project's freshwater wetland review agency, an Application to Alter a Freshwater Wetland will need to be filed with the RIDEM or an Application to Alter Freshwater Wetlands in the Vicinity of the Coast Application Package will need to be filed with the CRMC. Either of these applications requires public noticing, and will probably require a public hearing given the scope of the project and impacts. Public notices and hearings for the Freshwater Wetland Permits may be coordinated with the Section 404 and Water Quality Certification permit processes.

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