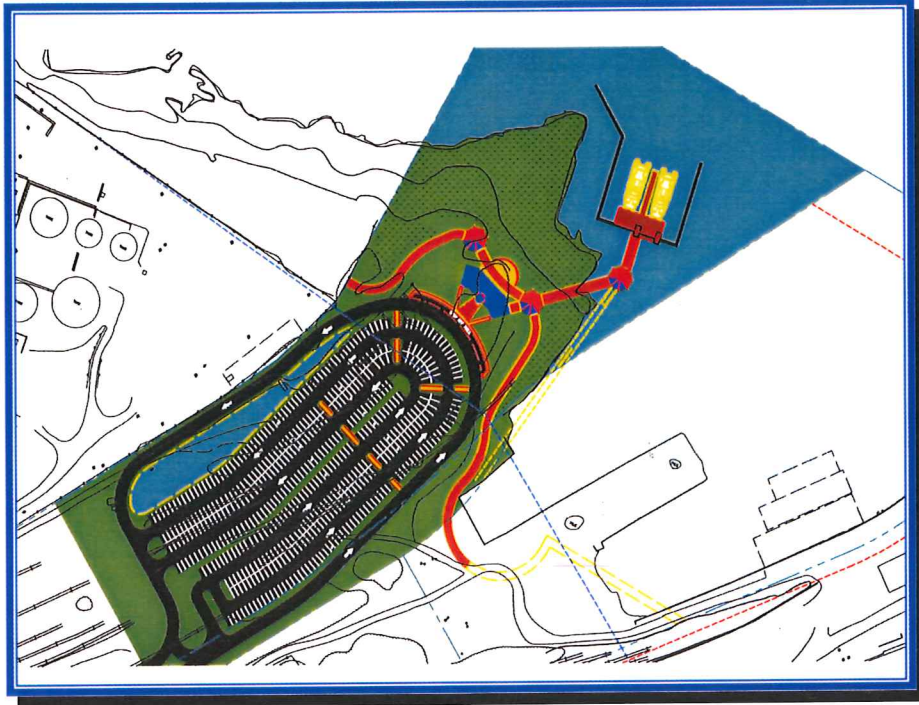


# Intermodal Ferry Transportation Center

City of South Amboy  
Middlesex County, New Jersey



## VOLUME I

### ENVIRONMENTAL ASSESSMENT AND SECTION 4(f) EVALUATION

U.S. Department of Transportation  
Federal Highway Administration  
And  
City of South Amboy

Submitted pursuant to 42 U.S.C. 4332 (2) (c)  
16 U.S.C. 470 (f), 49 U.S.C. 303, and 23 U.S.C. 138

November 2003



## **Intermodal Ferry Transportation Center**

**City of South Amboy  
Middlesex County, New Jersey**

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## Intermodal Ferry Transportation Center

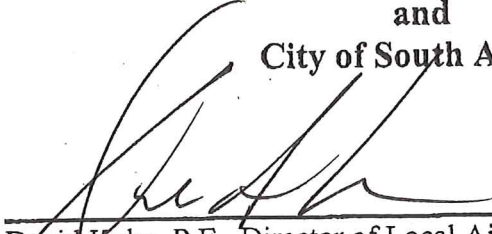
City of South Amboy  
Middlesex County, New Jersey

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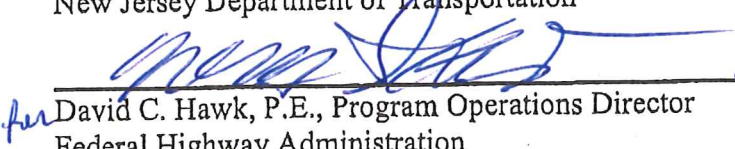
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U. S. Department of Transportation  
Federal Highway Administration  
and  
City of South Amboy

  
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## **Environmental Assessment of the Intermodal Ferry Transportation Center**

### **City of South Amboy, New Jersey**

## **EXECUTIVE SUMMARY**

### **Project Summary**

The following Environmental Assessment (EA) describes the results of the technical environmental studies (TES) conducted to determine potential environmental impacts associated with the proposed construction and operation of a ferry facility in South Amboy, New Jersey.

The elements of the proposed action would include the provision of access to the site across Main Street; construction of an upland access roadway between Main Street and the ferry parking area, construction of a parking area and ferry terminal; and in-water marine improvements to accommodate the operation of ferry vessels. The marine improvements include dredging of the ferry basin, slips, and access channel, construction of a breakwater and associated slips for the ferry and support vessels, and installation of new replacement bulkhead.

The EA has been prepared by the Federal Highway Administration (FHWA) and the City of South Amboy in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended, and implemented by the Council on Environmental Quality (CEQ) Regulations at 40 CFR 1500, and FHWA Procedures at 23 CFR 771

FHWA Regulations, in compliance with Section 4(f) of the 1966 U.S. Department of Transportation Act (U.S. law codified in 49 U.S.C. 303 and 23 U.S.C. 138) require that a Section 4(f) Evaluation be prepared for any federally-funded transportation project that may directly or indirectly affect a historic site of structure considered eligible for inclusion in the national register of Historic Places, and/or a significant publicly-owned park, recreational area, or wildlife/waterfowl refuge. Such a use is permissible only if there is no prudent and feasible alternative and that all possible planning to minimize harm is undertaken. The project area is within the general site of the former terminus of the Camden & Amboy (C & A) Railroad. The State Historic Preservation Officer (SHPO) has designated all aspects of the C&A Railroad as potentially eligible for the National Register of Historic Places. Therefore, a Section 4(f) evaluation has been undertaken and is presented in Section 6.0.

### **Summary of Impacts**

The impacts to social, economic, natural, and cultural resources, as documented in this Environmental Assessment (EA), have been based on the standard field, modeling, and analytical protocols. The impacts resulting from implementation of the proposed action have been summarized below.

- No adverse impacts to geology, soils, or groundwater have been anticipated.
- No adverse impacts to traffic or vehicular air quality have been identified, based on the evaluations conducted. Traffic at key intersections would operate at satisfactory levels of service.
- The project would not adversely impact threatened or endangered plant or animal species.
- Project-related vehicular noise levels on the access road as it passes across the Main Street overpass would result in an elevated noise impact to residences along Pupek Road. Incorporation of a noise barrier reduced these noise levels substantially below applicable FHWA noise criteria.
- Short-term, localized impacts to surface waters would occur during the construction phase of the project and would include temporary increases in turbidity and suspended sediments resulting from dredging of the ferry basin and access.
- Although adverse impacts to tidal wetlands vegetation have not been anticipated, additional wetlands plantings have been proposed along a portion of the ferry basin as a means to stabilize the exposed shoreline behind the degraded former bulkhead and provide an overall habitat enhancement.
- A hazardous waste preliminary assessment and site investigation were conducted and identified several areas of concern (AOC), including elevated soil PAH and metals, and petroleum hydrocarbon contamination of the groundwater. South Amboy is currently preparing a remedial action work plan (RAWP) for the project site, which will memorialize the remedial measures that will be taken to facilitate project construction. An approved RAWP would be obtained from NJDEP prior to actual construction on the site.
- The project is within the general site of the former terminus of the Camden & Amboy (C & A) Railroad. Archaeological investigations at the site have identified no subsurface resources. However, the State Historic Preservation Officer (SHPO) has designated all aspects of the C&A Railroad as potentially eligible for the National Register of Historic Places and, as such, the project has been found to have an adverse effect on the Register-eligible C&A Railroad terminus. A Section 4(f) evaluation has been undertaken and is presented in Section 6.0 of the EA, which evaluates alternatives to avoid 4(f) properties. A draft Memorandum of Agreement (MOA) has been prepared in concert with the State Historic Preservation Office (NJDEP, Office of NJ Heritage), Federal Highway Administration, NJ Department of

Transportation, and the City of South Amboy. This MOA identifies the requisite actions that must be taken to avoid or minimize impacts to the identified resources.

### **Project Coordination and Comments**

Section 4(f) procedures have been coordinated in accordance with procedures under 36 CFR 800 and Section 106 of the National Historic Preservation Act. As the agent of the Federal Highway Administration, the New Jersey Department of Transportation will take the lead role in ensuring coordination between these two regulatory procedures and NEPA. The New Jersey State Historic Preservation Officer will be a Consulting Party under 36CFR 800.2c to reflect the interests of the State and its citizens, and to advise and assist the NJDOT in fulfilling these regulatory requirements.

As part of the project coordination, public information meetings were held on 8 February 2001 and 27 June 2001. The purpose of these meetings was to advise the public as to the status of the project and provide information regarding the cultural resource investigations and Section 106 process.

Mitigation measures for Section 4(f) properties have been documented in a Memorandum of Agreement that has been prepared in concert with the State Historic Preservation Office (NJDEP, Office of NJ Heritage), Federal Highway Administration, NJ Department of Transportation, and the City of South Amboy.

**Environmental Assessment of the  
Intermodal Ferry Transportation Center**

**City of South Amboy, New Jersey**

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## **Environmental Assessment of the Intermodal Ferry Transportation Center**

### **City of South Amboy, New Jersey**

#### **1.0 INTRODUCTION**

##### **1.1 Technical Background**

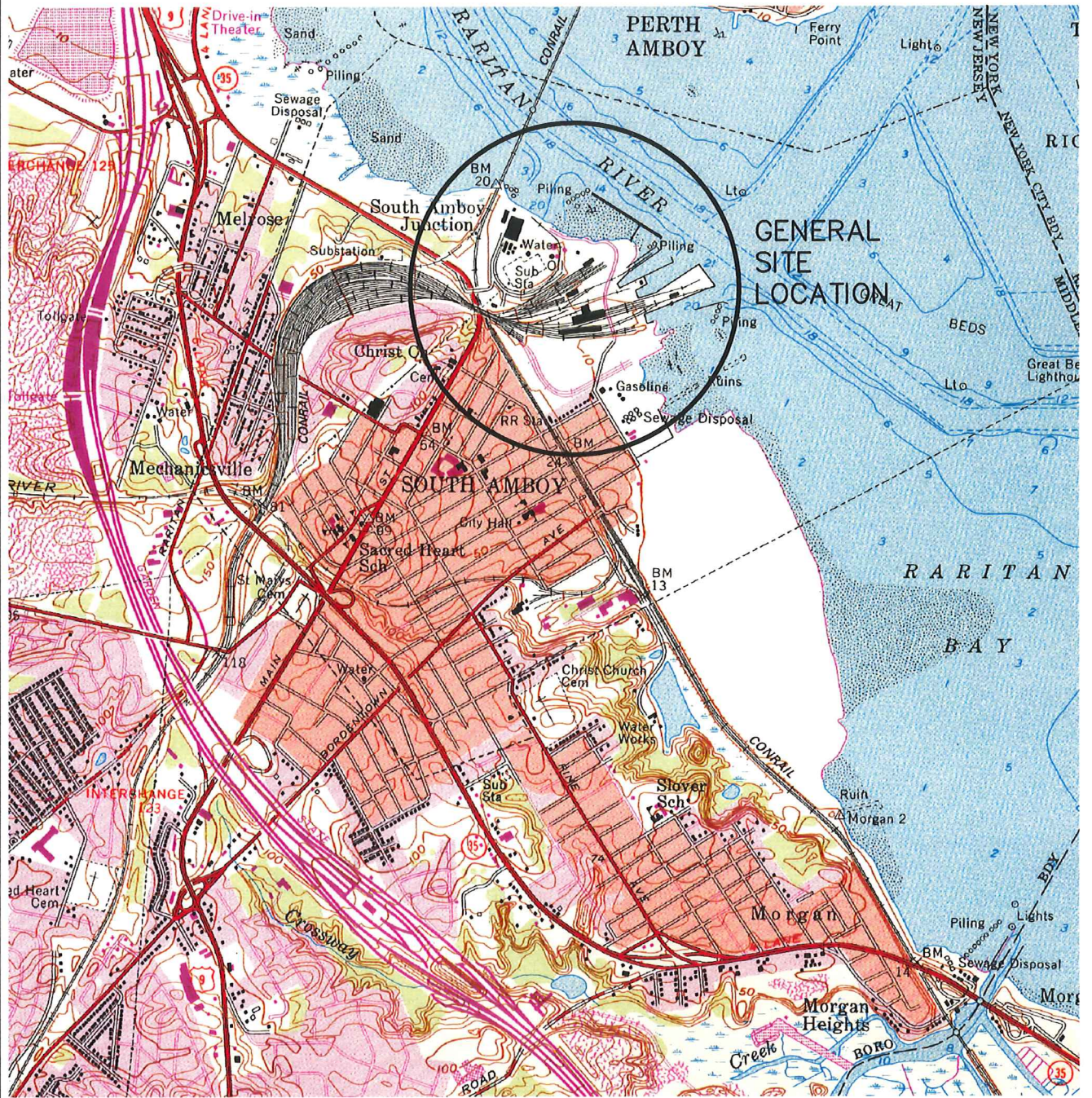
The following Environmental Assessment (EA) describes the results of the Technical Environmental Studies (TES) conducted to determine potential environmental impacts associated with the proposed construction and operation of a ferry facility in South Amboy, New Jersey. The elements of the proposed action would include the provision of access to the site across Main Street; construction of an upland access roadway between Main Street and the ferry parking area, construction of a parking area and ferry terminal; and in-water marine improvements to accommodate the operation of ferry vessels. The marine improvements include dredging of the ferry basin, slips, and access channel, construction of a breakwater and associated slips for the ferry and support vessels, and installation of new replacement bulkhead.

A more detailed description of the proposed action is presented in Section 3.0 of this EA, Description of the Proposed Action and Alternatives.

Figure 1-1, General Location/USGS Map, illustrates the regional location of the proposed project site. An illustration of the site location along the South Amboy waterfront is presented in Figure 1-2, Project Location Map.

The EA has been prepared by the Federal Highway Administration (FHWA) and the City of South Amboy in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended, and implemented by the Council on Environmental Quality (CEQ) Regulations at 40 CFR 1500, and FHWA Procedures at 23 CFR 771.

FHWA Regulations, in compliance with Section 4(f) of the 1966 U.S. Department of Transportation Act (U.S. law codified in 49 U.S.C. 303 and 23 U.S.C. 138) require that a Section 4(f) Evaluation be prepared for any federally-funded transportation project that may directly or indirectly affect a historic site or structure, or archaeological site considered eligible for inclusion in the National Register of Historic Places, and/or a significant publicly-owned park, recreational area, or wildlife/waterfowl refuge. Such a use is permissible only if there is no prudent and feasible alternative and that all possible planning to minimize harm is undertaken. The project area is within the general area of the former terminus of the Camden & Amboy (C & A) Railroad. The State Historic Preservation Officer (SHPO) has designated all aspects of the C&A Railroad as potentially eligible for the National Register of Historic Places. Therefore, a Section 4(f) evaluation has been undertaken and is presented in Section 5.0.



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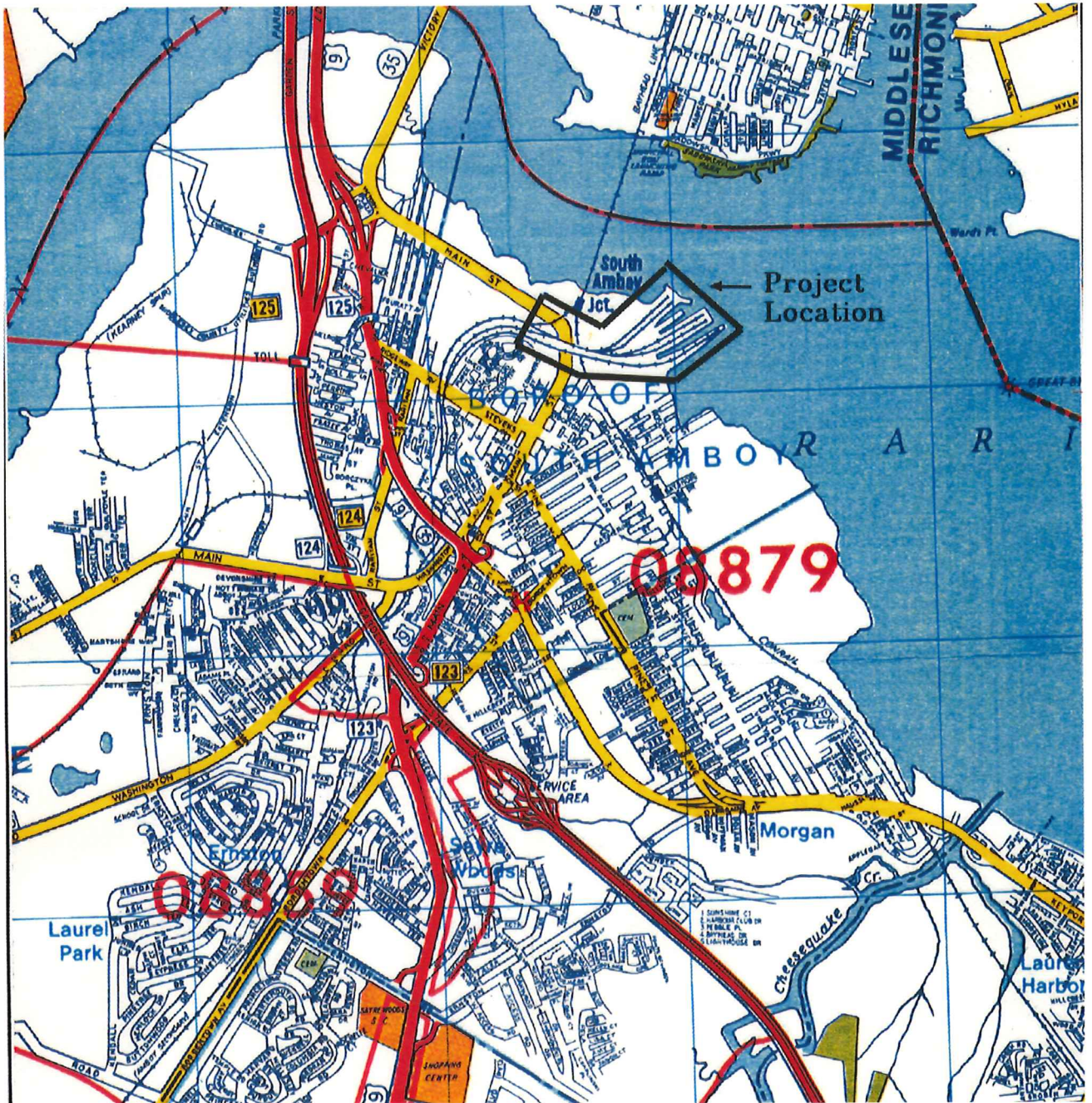
**GENERAL LOCATION MAP (USGS)**  
**SOUTH AMBOY FERRY TERMINAL PROJECT**  
**SOUTH AMBOY, NEW JERSEY**

SOURCE: SOUTH AMBOY QUADRANGLE  
USGS, REVISED 1981

FIGURE # **1-1**

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### PROJECT LOCATION MAP

SOUTH AMBOY FERRY TERMINAL PROJECT  
CITY OF SOUTH AMBOY, NEW JERSEY



**POTOMAC-HUDSON ENVIRONMENTAL, INC.**

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SOURCE: MIDDLESEX COUNTY ATALS  
HAGSTROM

FIGURE # **1-2**



## **1.2 Project Background**

The proposed construction of a Ferry Terminal along the South Amboy waterfront is one element of an overall Intermodal Transportation Center, which also includes a new NJ Transit rail station with elevated platform and improved bus access. The City's interest in integrating ferry service with the redevelopment of their waterfront is spurred by a number of factors. The City has historically been situated as a transportation crossroads and envisions the incorporation of a ferry service as a continuation of this trend. Congestion on area roadways has sparked new interest in the provision of ferry services where, regionally, more than thirteen ferry services now operate in the waterways of the New York metropolitan area. Marketing studies have indicated that there exists a strong demand for new service between South Amboy and lower Manhattan, a distance of 22 nautical miles.

Further, the proposed location of the ferry is in a portion of the South Amboy waterfront that was historically associated with maritime commerce, as coal was transferred from rail to barge and transshipped along the east coast. The site consists of approximately 36-acres, including 19.55-acres of upland and 16.09-acres of land under water. Historically, the site had been used as a rail yard, first by the Camden-Amboy Railroad and later by the Pennsylvania Railroad and, finally, ConRail.

More detailed information regarding the purpose and need for the proposed ferry operation is presented in the following Section 2.0.

## **2.0 PROJECT PURPOSE AND NEED**

### **2.1 Project Purpose**

The overall purpose of the Ferry Project is to provide a high-speed, convenient transportation alternative for commutation to and from New York City while satisfying a wide range of economic, environmental, and public needs of the City of South Amboy and Middlesex County:

Goals of the project include:

- The development of the derelict waterfront, including the proposed Ferry Project, is an essential component in the South Amboy Master Plan and Waterfront Redevelopment Plan for the Central Waterfront Redevelopment Area. This area, once a major rail and ferry facility for the transport of materials; has been unused as a port since the early 1950's.
- Development of the Ferry Project will create a range of employment opportunities, both short-term construction employment as well as longer-term commercial and retail opportunities;
- Development of the Ferry Project will provide an additional mass transit alternative. Ridership on the ferry will reduce the incidence of vehicular traffic on the area and regional roadways with concomitant reduction in vehicular related air pollutants;
- Development of the ferry project will result in the environmental remediation and revitalization of an inactive rail yard; and

As part of the Ferry Project, a waterfront walkway will be provided that will result in substantially increased public access to a portion of the waterfront not currently accessible

#### **Compatibility with City Plans**

Much of the City of South Amboy's waterfront area is substantially deteriorated and characterized by former industrial operations, vacant land, and deteriorating piers and bulkheads. The City's Master Plan encompasses the expanded utilization of the waterfront area, including the provision of ferry service and the location of requisite access roadway and parking facilities.

Under the Local Redevelopment and Housing Law (N.J.S.A. 40:12-A1 et seq.), a portion of the waterfront area encompassing the proposed ferry location has been designated as a redevelopment area, known as the Central Redevelopment Area. The South Amboy Redevelopment Agency (SARA) has prepared a redevelopment plan for this area that anticipates creation of a fully functional ferry operation.

Thus, the development of the ferry operation is compatible with local planning documents and consistent with applicable zoning. The proposed project would provide a first step towards redevelopment of an underutilized waterfront site and would provide safe and efficient access to the waterfront.

## **2.2 Project Need**

### **2.2.1 Ridership Demand**

A number of studies have been undertaken to determine the existing demand for ferry service from South Amboy to lower Manhattan. These studies have evaluated various ferry routes, ridership for each of the routes, and cost structure. All studies have demonstrated that a substantial demand exists for transportation alternatives that avoid use of surface roadways.

The South Amboy commutershed, i.e., the area within which South Amboy is likely to draw the greatest percentage of its perspective ferry ridership, is comprised of the following municipalities: Colts Neck, East Brunswick, Hazlet, Holmdel, Keansburg, Manalapan, Marlboro, Matawan/Aberdeen, Old Bridge, Sayreville, South Amboy, and Woodbridge.

The following ferry ridership (see Table 2.1) has been determined, based upon the South Amboy commutershed and a ferry trip time, of approximately 48 minutes.

**Table 2.1: Ferry Ridership Figures**

<b><u>Year</u></b>	<b>Average Weekday</b>	<b>Average Annual Weekday</b>	<b>Average Weekend</b>
2002*	1,000	260,000	24,960
2003	1,030	267,800	25,459
2004	1,061	275,834	25,968
2005	1,093	284,109	26,488
2011	1,305	339,241	29,830

Source: Communication from City of South Amboy

\* Actual ridership counts from ferry service temporarily operating from an adjacent site demonstrate that average weekly (excluding weekends) ridership from South Amboy to Pier 11 and 34<sup>th</sup> Street in New York City for June 2002 was approximately 3,327 or 665 per weekday.

### **2.2.2 Economic Needs**

The City of South Amboy, while located proximal to the NJ Turnpike and Garden State Parkway, and served by NJ Transit rail, has not been well positioned to attract new businesses. As a result, there has been a net loss of businesses from the City, with a

resultant loss of taxable income. The City is exploring a number of strategies to attract new businesses, including the imposition of a ferry service to New York City.

The proposed ferry project is expected to result in numerous primary and secondary benefits to the City. Given the potential for future taxable development, the proportion of the \$15.5 million in construction costs that would be spent in South Amboy, the presumed increase in commuter traffic and spending, and creation of new jobs, the fiscal impacts would appear to be entirely beneficial.

The multiplier effect of construction expenditures, jobs created during both construction and operation of the terminal facility, the probability of additional, future development, and the spending generated by an increased commuter throughput would all create a healthy stimulus to South Amboy's economy.

### **2.2.3 Need to Reduce Congestion**

Peak hour local vehicular volumes tend to move out of the City in the am and reverse in the pm. Many of these movements are directed to and from the major arterials leading to northern New Jersey and New York City. Local city streets suffer from congestion, with substantial delays encountered at key intersections. Transportation alternatives are needed to reduce congestion and improve traffic flow.

Provision of a convenient, faster, and cost-effective ferry alternative is anticipated to greatly relieve peak hour traffic congestion on local streets, including Main Street, Broadway, and Bordentown Avenue. Ferry users diving into the City to the terminal would be going against the am peak hour movement, which is out of town, and vice versa in the evening pm peak. Further, ferry users from within the City would divert traffic from local and outlying roadways.

### **2.2.4 Need to Improve Air Quality**

The State of New Jersey is non-attainment for ozone. Further, the Air Quality Index (AQI), a measure of the air quality effects on human health maintained by NJDEP, reported for 1999 (the latest year available) that the Suburban AQI Reporting Region, which includes the City of South Amboy, had 25 days with unhealthful air quality and two days with very unhealthful air quality. On behalf of the health of its citizenry, the City is looking at all strategies to improve local and regional air quality.

The proposed ferry is expected to result in a decrease in vehicle-miles-traveled (VMT) on local and regional roadways by diverting trips from the personal vehicle to a mass transit (ferry) alternative. Further, the reduction of VMT within a regional context translates into improved local and regional air quality, especially with respect to hydrocarbons and oxides of nitrogen that are precursors of smog.

### **2.2.5 Need to Provide Environmental Cleanup of Waterfront Sites**

Much of the City of South Amboy's waterfront is former industrial land that has been contaminated as a result of the operations that had occurred there in the past. These waterfront sites include a former municipal landfill, a power generating facility, a range of warehousing uses, and a rail yard. Many of these sites have had reported spills, but have not yet been evaluated in accordance with the NJDEP Technical Regulations on Site Remediation. Thus, although the City Master Plan envisions the development of these properties, the City does not have the financial resources to accomplish site investigation and cleanup.

The proposed project would result in the remedial cleanup of an approximately 17-acre inactive rail yard fronting Raritan Bay. Based on the initial investigations that have been funded under an USEPA Brownfield Pilot Program, the site has historic fill and limited free product on the groundwater. The likely remedial alternative for soils that is being proposed in a Remedial Action Work Plan (under preparation) would be capping with two-feet of clean fill or other impermeable surface. The location of the parking facility and the ferry terminal building would both constitute an impermeable cap. Cleanup of groundwater is proposed using conventional methods of oil/water separation and charcoal filtration. This cleanup can occur concomitantly with development and operation of the ferry terminal. A project-specific Health & Safety Plan (HASP) will be developed to identify specific procedures and measures to provide for worker health and safety during project construction and minimize contact with contaminated soils and groundwater.

### **2.2.6 Public Needs**

As noted previously, South Amboy's waterfront area consists largely of underutilized land that is characterized by abandoned buildings, inactive rail yards, and degraded industrial facilities. Further, the waterfront is separated from the downtown area and majority of the City's residential neighborhoods by the North Jersey Coast line of NJ Transit. As a result, there is essentially no pedestrian access to the waterfront north of John Street.

As a result of the ferry project, the City's public access goals will be furthered through the construction of a new access road to the waterfront and parking facility. Although the parking facility will be serving commuter needs during the workweek, sufficient parking will be available to accommodate the public.

A pedestrian walkway will be located along the water's edge, and will extend from the ferry terminal building south to the foot of the existing pier serving the aggregate industry. The City's intent would be to extend this waterfront walkway to the north and south as future development of the waterfront occurred.

### **3.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

#### **3.1 Proposed Action**

The project action consists of the construction of an upland access roadway, parking area, and ferry terminal; and in-water marine improvements to accommodate two ferry vessels. The marine improvements include dredging of the ferry basin, slips, and access channel, construction of a breakwater and associated slips for the ferry and support vessels, and installation of limited quantities of replacement bulkhead. A summary of the project components is provided below and illustrated on Figure 3-1, Proposed Action Alternative.

- **Main Street Crossing**

The Main Street crossing would utilize the part of the reconstructed "ConRail" overpass (Note: The reconstruction of the overpass is driven by the unsafe condition of the structure and is proceeding independently of the development of the ferry operation). The access road leading to the overpass across Main Street would require a new signalized intersection at Main Street, including acceleration and deceleration lanes along Main Street and a northbound left turn jug handle.

- **Access Roadway and Parking Area**

Access to the proposed ferry terminal would require the construction of an approximately 2,500-linear foot access roadway linking Main Street with the ferry terminal. The two-lane access road plus shoulders and 16-foot median would cross Main Street via the ConRail overpass and continue towards the proposed ferry terminal and parking area following the route of an existing unpaved roadway used by vehicles associated with McCormick Aggregate, a sand and gravel facility.

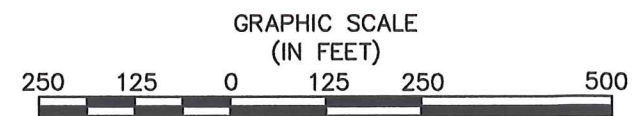
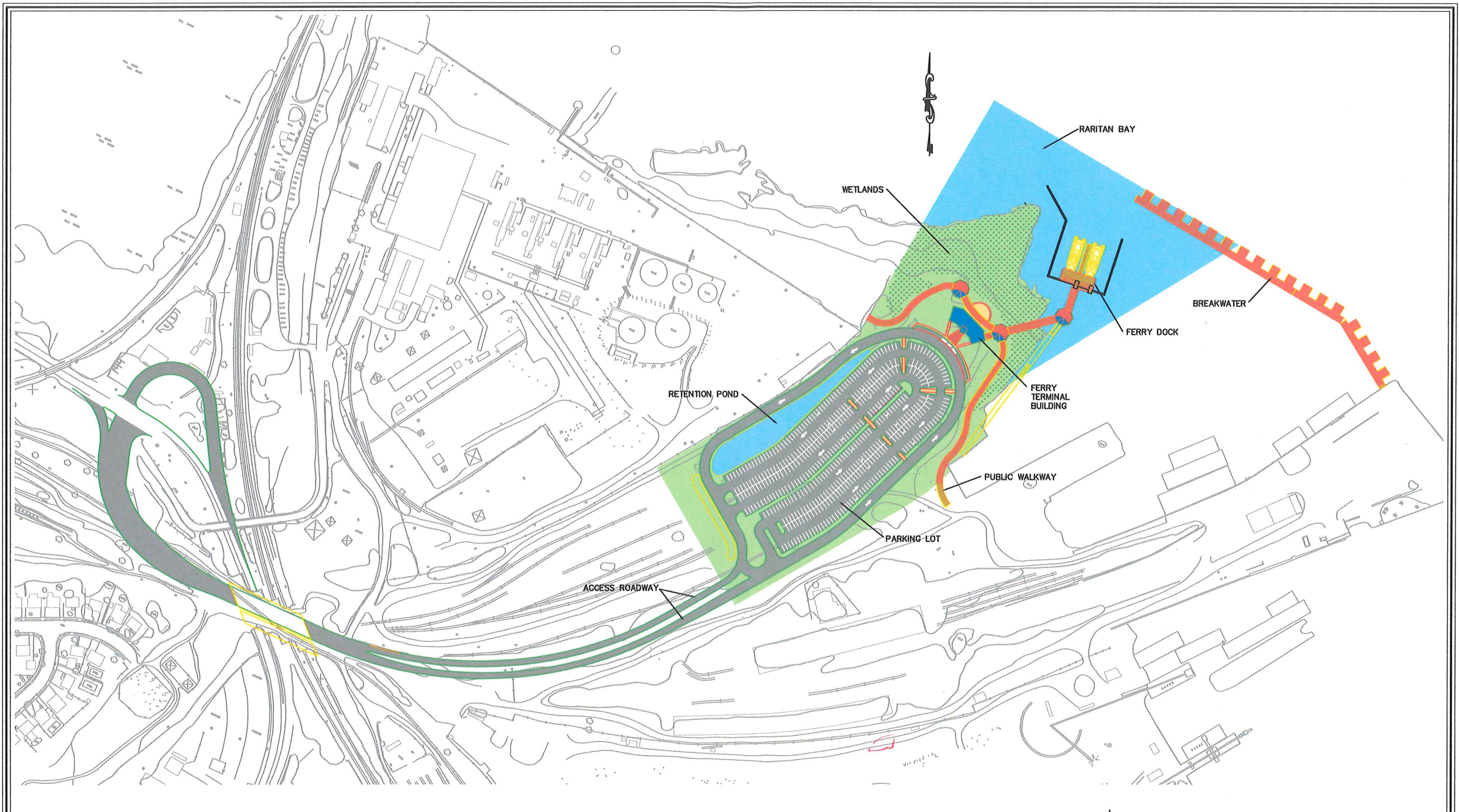
The paved at-grade parking area would be designed to accommodate approximately 500 cars.

- **Ferry Terminal**

The ferry terminal building would initially consist of a temporary structure, probably a trailer, that would accommodate both terminal offices and ticket sales.

Access to the ferry docks, which are located in a deeper water area to be dredged as part of this project, would be along an elevated walkway from the mainland to the dock.

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DATE: 11/14/01	DRAWN BY: JFK	REVIEWED BY: MM	SCALE: AS SHOWN	PROJECT # 39.0413	SHEET # 1 OF 1
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**POTOMAC-HUDSON ENVIRONMENTAL, INC.**  
 166 John Street  
 PO Box 7  
 South Amboy, NJ 08879

23 Chapel Avenue  
 Jersey City, NJ 07305

136 W. 16th Street  
 Suite 3E, POB 1206  
 New York, NY 10011

DATE	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
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Proposed Action Alternative  
 South Amboy Ferry Terminal Project  
 City of South Amboy, New Jersey

SOURCE: Operations2.dwg  
 CME Associates (8/27/01)

FIGURE #  
**3-1**

- **Dredging and Dredged Material Disposal**

It has been estimated that approximately 36,000 cy of sediments must be dredged to provide sufficient depths within the ferry basin, slips, and access channel. It is anticipated that all dredged material would be disposed in an upland, on-site location. The dredged material would be used as fill to bring the site to the desired grade.

- **Breakwater**

An approximately 816-foot breakwater would be installed to provide protection for the ferry operation and associated basin. Hydrographic modeling has been undertaken to simulate the wave fetch and energy anticipated at the ferry facility and this information has formed the basis for determining the breakwater size and composition. Several alternative designs have been evaluated, but a floating-type breakwater is proposed.

- **Ferry Dock and Slips**

The ferry dock would be designed for two ferry slips. An elevated 14-foot walkway would connect the ferry dock with the mainland. A wave barrier would be located on the western edge of the dock to buffer wave energy from vessel wakes.

- **Public Access**

A 14-foot wide public access walkway is proposed to extend along the waterfront. In the vicinity of the ferry terminal building, a central overlook with flanking viewing gazebos would be provided.

A site plan of the proposed action is presented in Figure 3-1.



### **3.2 Alternatives to the Proposed Action**

The City of South Amboy has also considered various alternatives to the proposed action as well as alternatives to specific elements of the proposed action, including:

- **No Build Alternative**
- **Build Alternatives**
  - **Alternative Development Sites**
  - **Alternative Ferry Landing Locations**
  - **Main Street Crossings**
  - **Access Alternatives**
  - **Breakwater Alternatives**

#### **3.2.1 No Build Alternative**

Under this alternative, the proposed access road, parking, ferry terminal, and public access walkway would not be constructed.

Existing traffic patterns and roadways would remain unchanged.

Implementation of this alternative would not further the City of South Amboy's goals regarding the provision of improved transportation movement and improved air quality.

Implementation of this alternative would similarly not realize the City of South Amboy's Master Plan and Redevelopment Plan goals regarding waterfront redevelopment and its associated improved public access and public recreation objectives.

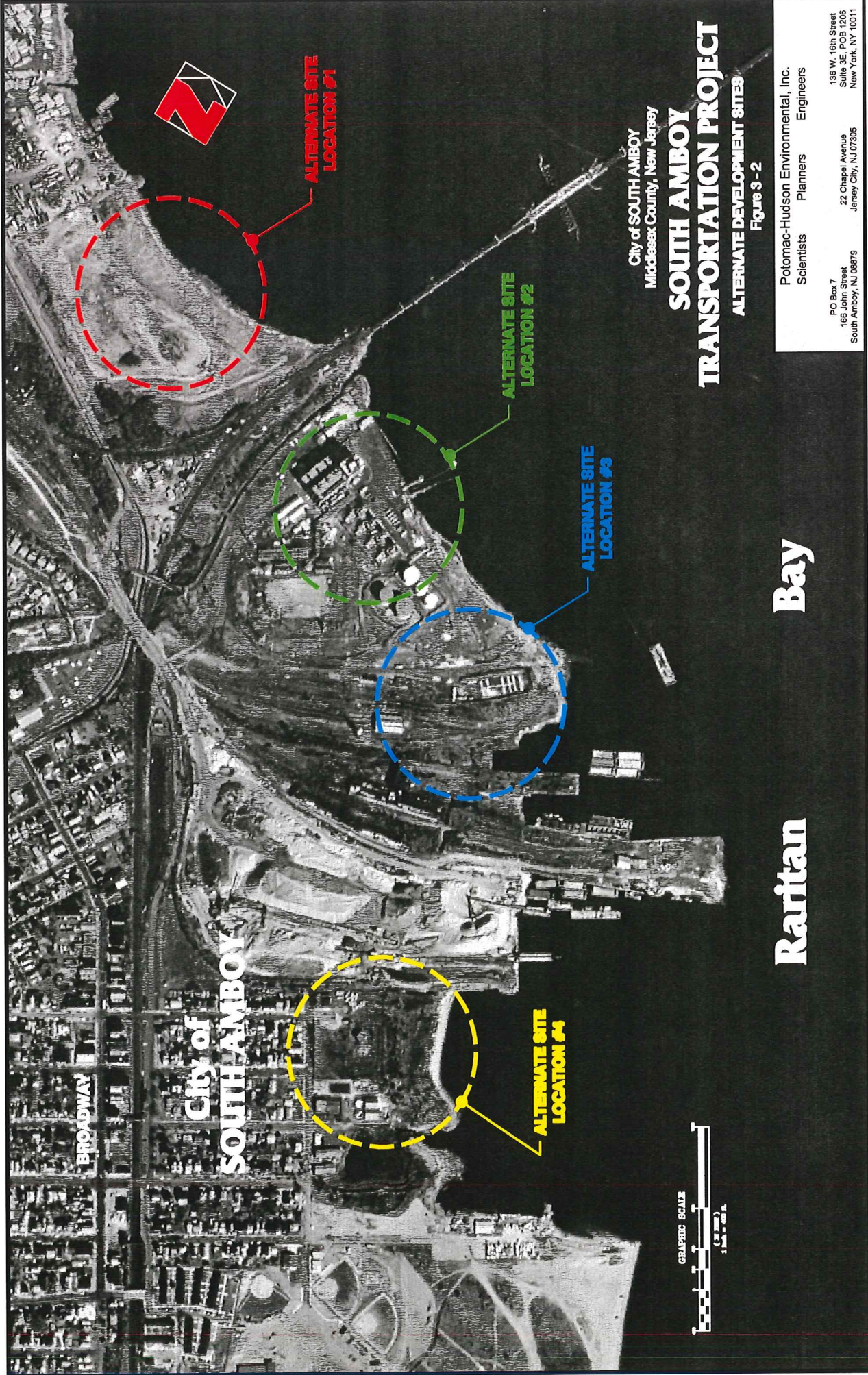
This alternative would also not provide the funding impetus to remediate the former ConRail site, thereby postponing the brownfields cleanup to a subsequent time in the future.

#### **3.2.2 Alternative Development Sites**

Several alternative development sites were evaluated, including one site to the west of the NJ Transit Railroad Bridge across Raritan Bay (Site 1), and three sites east of the Railroad Bridge (Sites 2-4). The location of the alternative sites are illustrated in Figure 3-2 and described below.

##### **Alternate Site 1**

Alternate Site 1 is located in an undeveloped area to the west of the NJ Transit Coast Line. Access could be provided from Main Street to the south. Water depths would require some dredging depending upon the length of the ferry pier extending out from the shoreline. A fringe of coastal saltmarsh cordgrass (*Spartina alterniflora*) exists along the intertidal area.



BROADWAY

City of  
SOUTH AMBOY

ALTERNATE SITE  
LOCATION #1

ALTERNATE SITE  
LOCATION #2

ALTERNATE SITE  
LOCATION #3

ALTERNATE SITE  
LOCATION #4

City of SOUTH AMBOY  
Middlesex County, New Jersey

# SOUTH AMBOY TRANSPORTATION PROJECT

ALTERNATE DEVELOPMENT SITES  
Figure 3 - 2

Bay

Raritan

GRAPHIC SCALE  
1" = 100'

Potomac-Hudson Environmental, Inc.  
Scientists Planners Engineers  
136 W. 16th Street  
Suite 2E, PO 1201  
New York, NY 10011  
PO Box 7  
166 John Street  
South Amboy, NJ 08879  
22 Chapel Avenue  
Jersey City, NJ 07305

However, because of the clearances associated with the NJ Transit Coast Line bridge, the swing bridge would be required to open to allow ferry passage through the bridge. Since peak hour ferry use would occur concurrently with peak commuter rail usage, frequent required openings of the bridge would pose a substantial conflict. For this reason, this alternate was not considered further.

### **Alternate Site 2**

Alternate Site 2 is located on the property currently occupied by Jersey Central Power & Light (JCP&L). There is an existing bridge access to the site over Main Street and the Coast Line along a single-lane steel bridge. This bridge and its associated curve radii would not provide the vehicular capacity needed to accommodate the anticipated traffic demand to the ferry landing, thereby requiring the construction of a new structure.

An existing pier and sufficient depth would provide access for a limited ferry operation, although reconstruction of the pier and dredging would be required to accommodate the level of ferry service proposed.

In addition to access constraints, a major limitation of this site is that the JCP&L facility is undergoing decommissioning, but the timing of that process as well as the potential environmental remediation that may be required at the site is unknown. For these reasons, this alternate was not considered further.

### **Alternate Site 3**

Alternate Site 3 is the preferred action alternate. The land is vacant and available for development within an immediate time frame. There are no freshwater wetlands on the site. Although there is a substantial coastal saltmarsh along the headland, location of the ferry landing and associated dredging for the ferry can avoid impacts to this area. Access to the site can be provided to the site using the reconstructed ConRail bridge over Main Street.

This site is within the historic Camden & Amboy Railroad corridor and any development proposed will require coordination and consultation with the State Historic Preservation Officer.

### **Alternate Site 4**

Alternate Site 4 is located east of McCormick Aggregate, and is represented as a vacant, formerly industrial tract north of Rosewell Street. The presence of aboveground storage tanks suggests the former use of a portion of this property and the potential for

environmental remediation. The waterfront is a gravelly beach with reasonable water depths a short distance offshore.

The primary disadvantage of this site is that the interior of the site is comprised of jurisdictional freshwater wetlands. Any construction of ferry ancillary facilities would require filling of wetland areas. Further, providing vehicular site access to this location would require directing traffic flow on secondary streets through existing residential areas. For these reasons, this alternate was not considered further.

### **3.2.3 Alternative Ferry Landing Sites**

Several alternative ferry landing locations within the proposed development site were evaluated. The location of the alternative landing sites are illustrated in Figure 3-3 and described below.

#### **Alternate Ferry Location 1**

Alternate location 1 is along the western edge of the long pier that extends into the bay. This location is characterized as having sufficient depths for ferry operation. This location would require the shortest breakwater, since the pier, per se, would provide protection against the worst of the long fetch northeastern storms.

The immediate disadvantage of this site is that the pier is currently actively used by McCormick Aggregate and is the primary location for their associated aggregate barge operation.

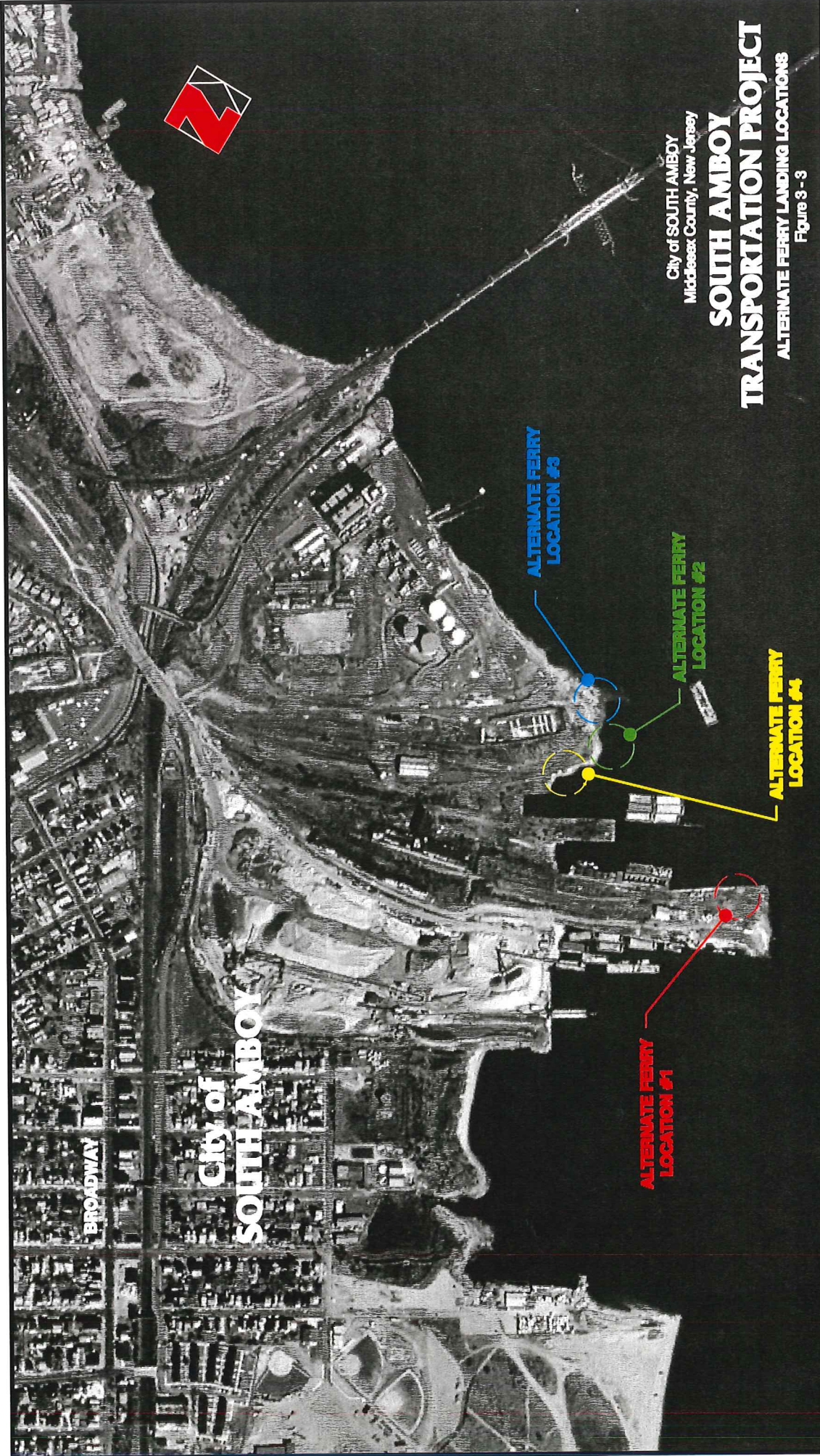
#### **Alternate Ferry Location 2**

Alternate location 2 is the preferred location of the ferry landing. It requires the least amount of dredging of any in-basin alternate (approximately 36,000 cy), avoids direct impacts to existing coastal saltmarsh through use of elevated walkways and wave barriers, and allows the ferry to proximal to the proposed terminal and parking.

All of the in-basin Alternatives 2, 3, and 4, require an offshore breakwater ranging from approximately 800 to 900 feet in length.

#### **Alternate Ferry Location 3**

Alternate location 3 was the originally proposed site of the ferry, and would have been located where, historically, earlier ferries had shuttled coal back and forth within the bay. However, site-specific field surveys, conducted as part of the environmental review process, identified a substantial coastal saltmarsh extending within the intertidal zone at



City of SOUTH AMBOY  
Middlesex County, New Jersey

# SOUTH AMBOY TRANSPORTATION PROJECT ALTERNATE FERRY LANDING LOCATIONS

Figure 3-3

Potomac-Hudson Environmental, Inc.	
Scientists	Planners
Engineers	
PO Box 7	138 W. 16th Street
166 John Street	Suite 2E, PO #1206
South Amboy, NJ 08879	New York, NY 10011

Raritan Bay

ALTERNATE FERRY LANDING LOCATIONS #1-4



this location. Due to the value of these wetlands in terms of productivity and habitat, and the degree of damage that location of the ferry would have wrought, primarily due to dredging, this alternate was not considered further.

#### **Alternate Ferry Location 4**

Alternate location 4 would provide the shortest pedestrian route between the parking and terminal area and the ferry landing. However, due to its landwardmost location, this alternate results in the greatest quantity of dredging (approximately 75,000 cy). Furthermore, interviews with ferry operators indicated some concern regarding the ability to have sufficient maneuvering room at this location. All of the operators queried felt that the ferry would need to turn around at this location rather than reverse across the basin.

On the basis of the increased dredging and operational concerns, this alternative was not considered further.

### **3.2.4 Alternative Main Street Crossings**

#### **Access Road With Relocated Main Street**

Figure 3-4 depicts the proposed access road off of a relocated Main Street. Main Street would remain elevated North of Broadway to the underpass at the railroad bridge to the north. The existing Conrail bridge and JCP&L bridge would have to be demolished. Two new bridge structures would be required for the access road over NJ Transit and over the relocated Conrail. A new Conrail bridge would also be required over the relocated Main Street.

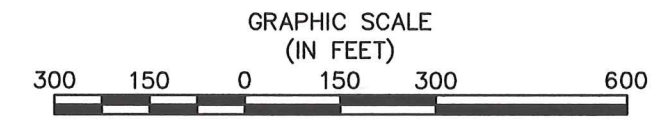
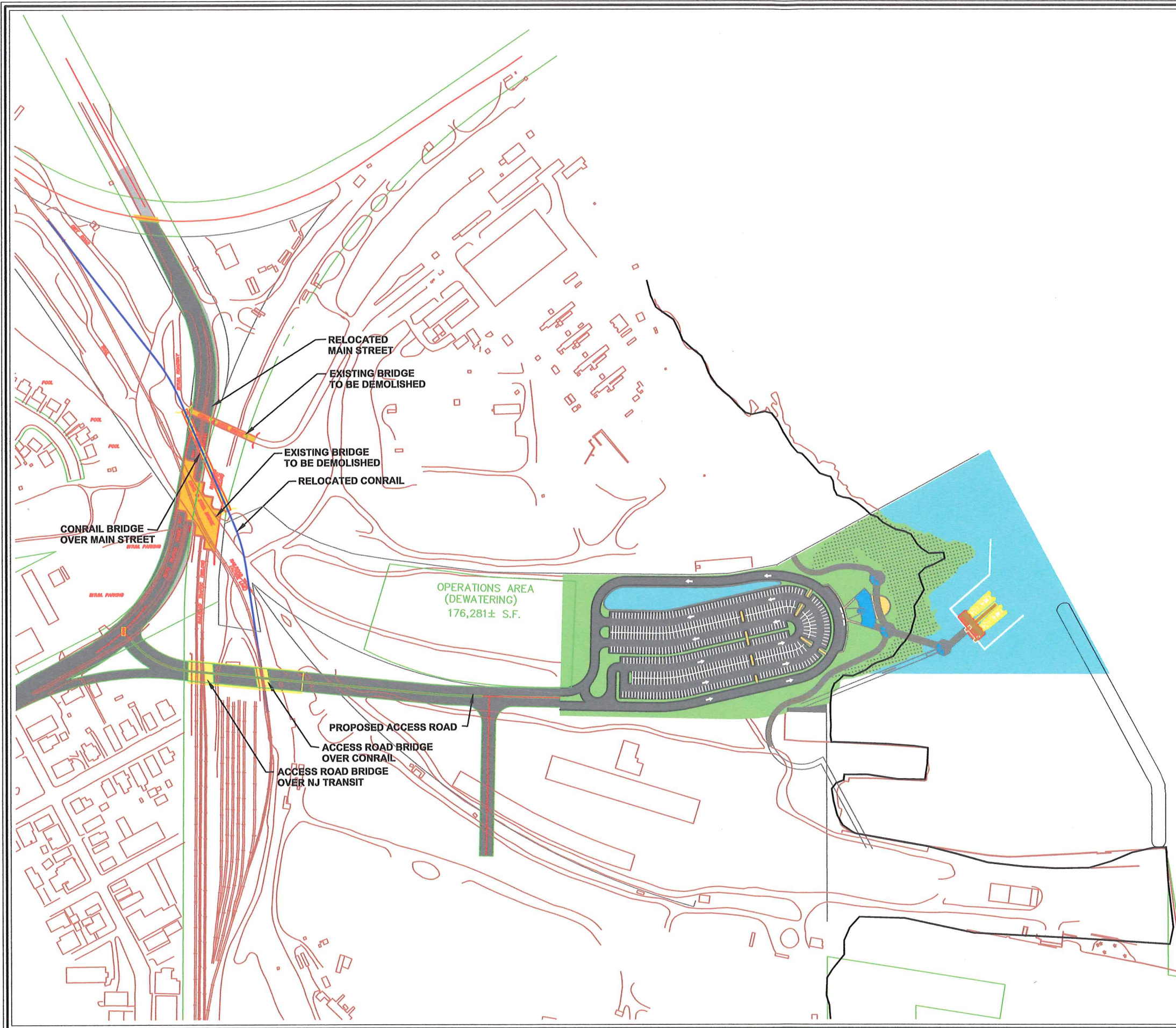
The major limitations of this alternative were the impact to the existing residence to the South and the property along Main Street, and the cost associated with construction of two new bridge structures. The Conrail track relocation work was also found to be extensive. To achieve a track profile that would pass under the access road and over an elevated Main Street while still meeting underclearance requirements was not feasible. For this reason, this alternative was not considered further.

#### **Access Road With Existing Main Street**

Figure 3-5 depicts Main Street in its present state. The proposed access road is moved approximately 50 feet south with two new bridge structures over NJ Transit and Conrail. The existing ConRail bridge and JCP&L bridge remain over Main Street.

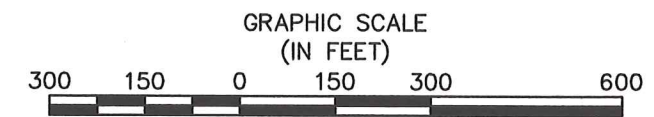
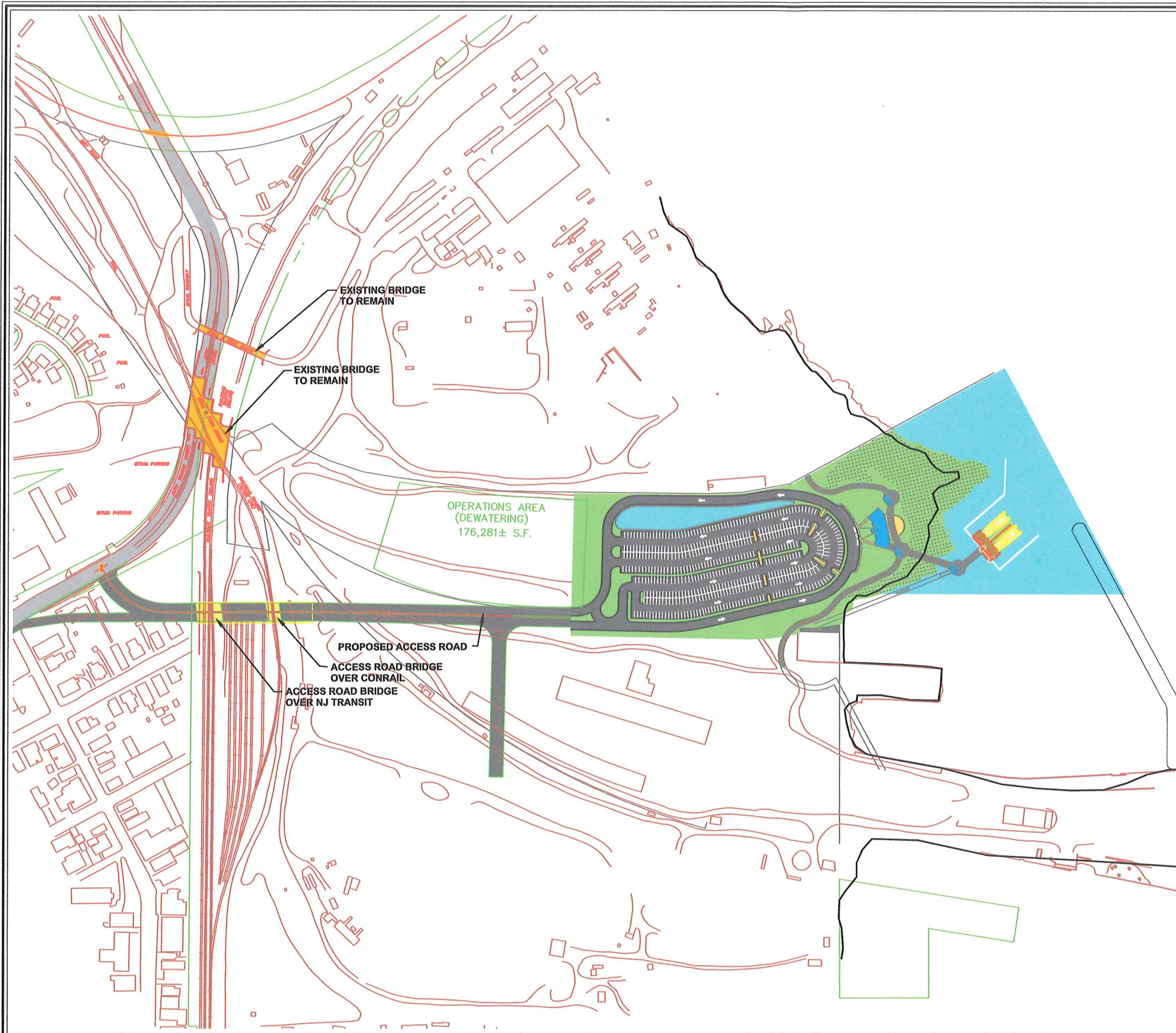
The major limitations of the alternative are the impact to the residences to the south of the access road and the construction of two additional bridge structures over NJ Transit and

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<b>ACCESS ROAD WITH RELOCATED MAIN STREET SOUTH AMBOY FERRY TERMINAL SOUTH AMBOY, NEW JERSEY</b>				
SOURCE: CME ASSOCIATES and HUNTER RESEARCH			FIGURE # <b>3-4</b>	
DATE: 3/14/02	DRAWN BY: JFK	REVIEWED BY: DRD	SCALE: AS SHOWN	PROJECT # 413
			SHEET # 1 OF 1	
166 John Street PO Box 7 South Amboy, NJ 08879		23 Chapel Avenue Jersey City, NJ 07305		136 W. 16th Street Suite 3E, POB 1206 New York, NY 10011

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**ACCESS ROAD WITH  
 EXISTING MAIN STREET  
 SOUTH AMBOY FERRY TERMINAL  
 SOUTH AMBOY, NEW JERSEY**

SOURCE: CME ASSOCIATES and HUNTER RESEARCH	FIGURE # <b>3-5</b>
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DATE: 3/14/02	DRAWN BY: JFK	REVIEWED BY: DRD	SCALE: AS SHOWN	PROJECT # 413	SHEET # 1 OF 1
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166 John Street PO Box 7 South Amboy, NJ 08879	23 Chapel Avenue Jersey City, NJ 07305	136 W. 16th Street Suite 3E, POB 1206 New York, NY 10011
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Conrail. The existing deficiencies of the existing Conrail bridge are also not addressed with this alternative. The access road would be constructed over McCormick Aggregate's existing mining operation and would require extensive grading due to the underclearance requirements of NJ Transit. For this reason, this alternative was not considered further.

### **Access Road Over Relocated Conrail**

Figure 3-6 depicts a crossover of the Conrail tracks to the west of the NJ Transit tracks. Two new bridge structures would be required. An Access Road bridge over NJ Transit and relocated Conrail tracks and a Main Street bridge over relocated Conrail. The existing Conrail bridge and JCP&L bridge would be demolished. Approximately 2,000 linear feet of Conrail track relocation will be required.

The major limitation of this alternative was the relocation of the Conrail tracks to the west of NJ Transit. The railroad tracks would then pass below relocated Main Street and rise with an unacceptable incline (grade) to meet the existing railroad tracks at the northern spur. Raising Main Street also created major impacts to the residential properties long this roadway as well as their access to the roadway. For these reason, this alternative was not considered further.

### **Access Road By Reconstructed Conrail Bridge**

Figure 3-7 is the preferred alternative. The Access Road would follow the existing access to the site, across a reconstructed ConRail bridge whose reconstruction is proceeding independently of development of the ferry site. Main Street would be improved to accommodate a 16'-16" underclearance for the roadway and a jug handle to a signalized intersection between existing Main Street and the proposed Access Road. A noise wall is also proposed between the relocated Conrail track and the adjacent residences to the South.

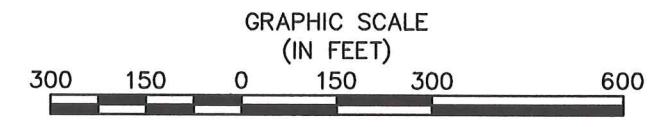
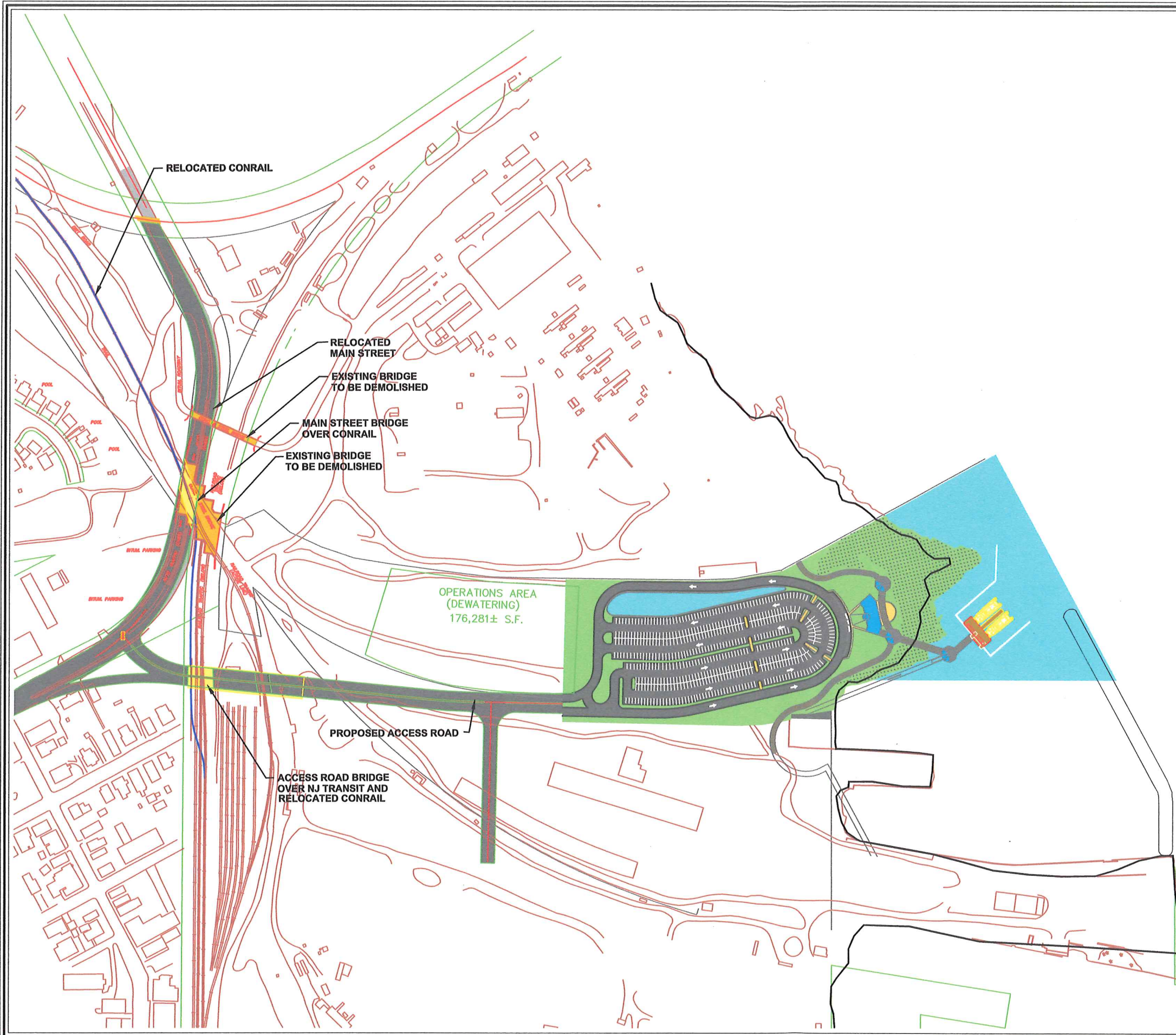
## **3.2.5 Access Road Alternatives**

### **Access Road Alternative**

Figure 3-8 depicts two (2) Access Road alternatives to the proposed ferry parking and terminal. The proposed northern access road alternative approaches the proposed ferry parking on the north side. The new Access Road bridge would cross Main Street and NJ Transit on a perpendicular alignment.

The major limitation of this alignment was the horizontal geometry of the access road ramp. The proposed bridge structure would need to be constructed on a curve and be super-elevated which would be undesirable and costly. The Conrail track relocation

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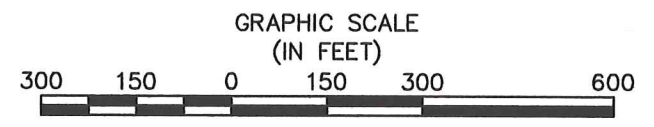
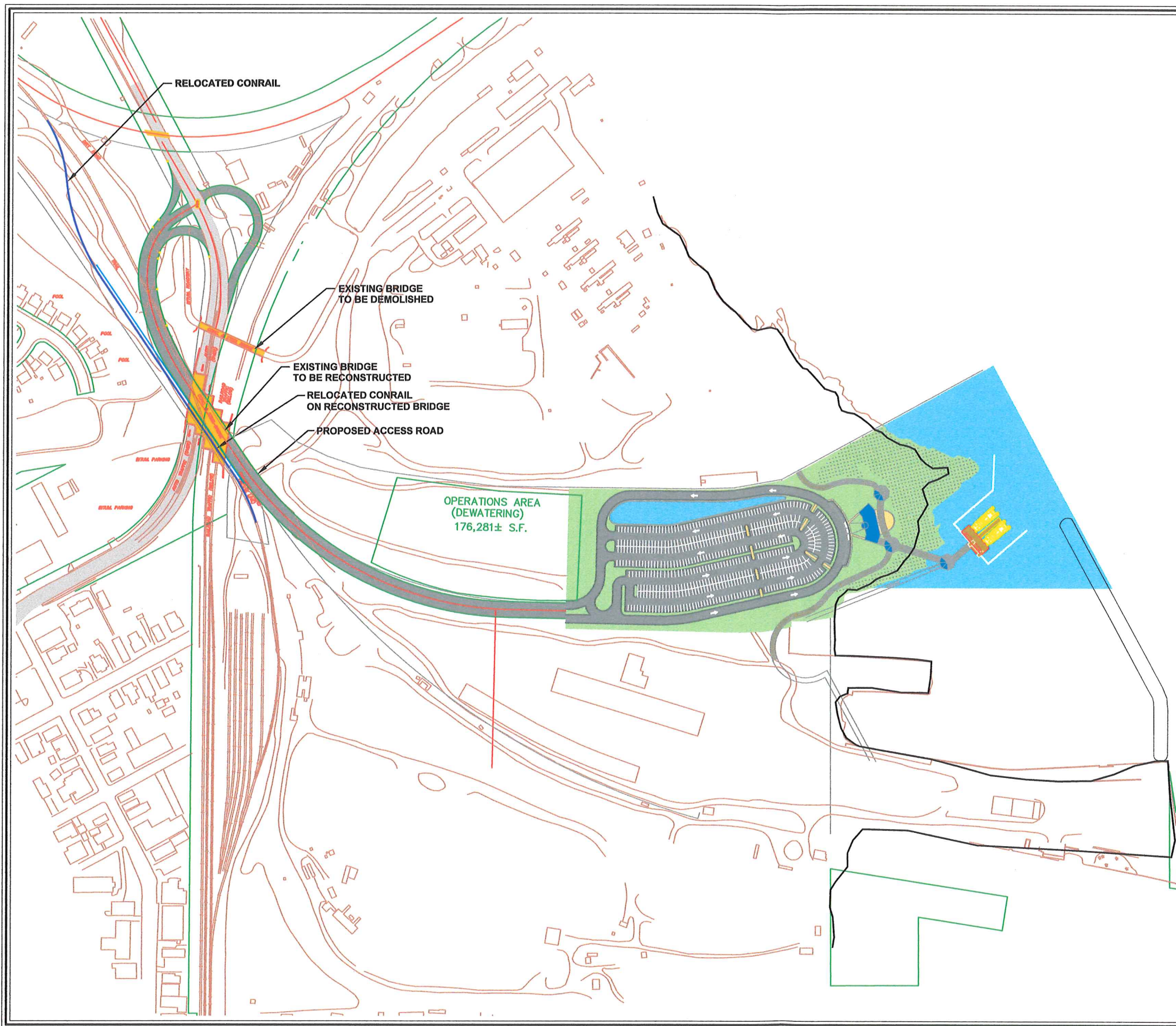


DATE	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
<b>ACCESS ROAD OVER RELOCATED CONRAIL SOUTH AMBOY FERRY TERMINAL SOUTH AMBOY, NEW JERSEY</b>				
SOURCE: CME ASSOCIATES and HUNTER RESEARCH			FIGURE # <b>3-6</b>	
DATE: 3/14/02	DRAWN BY: JFK	REVIEWED BY: DRD	SCALE: AS SHOWN	PROJECT # 413
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ACCESS ROAD BY  
RECONSTRUCTED CONRAIL BRIDGE  
SOUTH AMBOY FERRY TERMINAL  
SOUTH AMBOY, NEW JERSEY

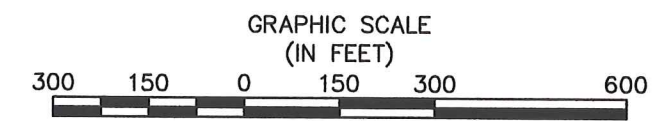
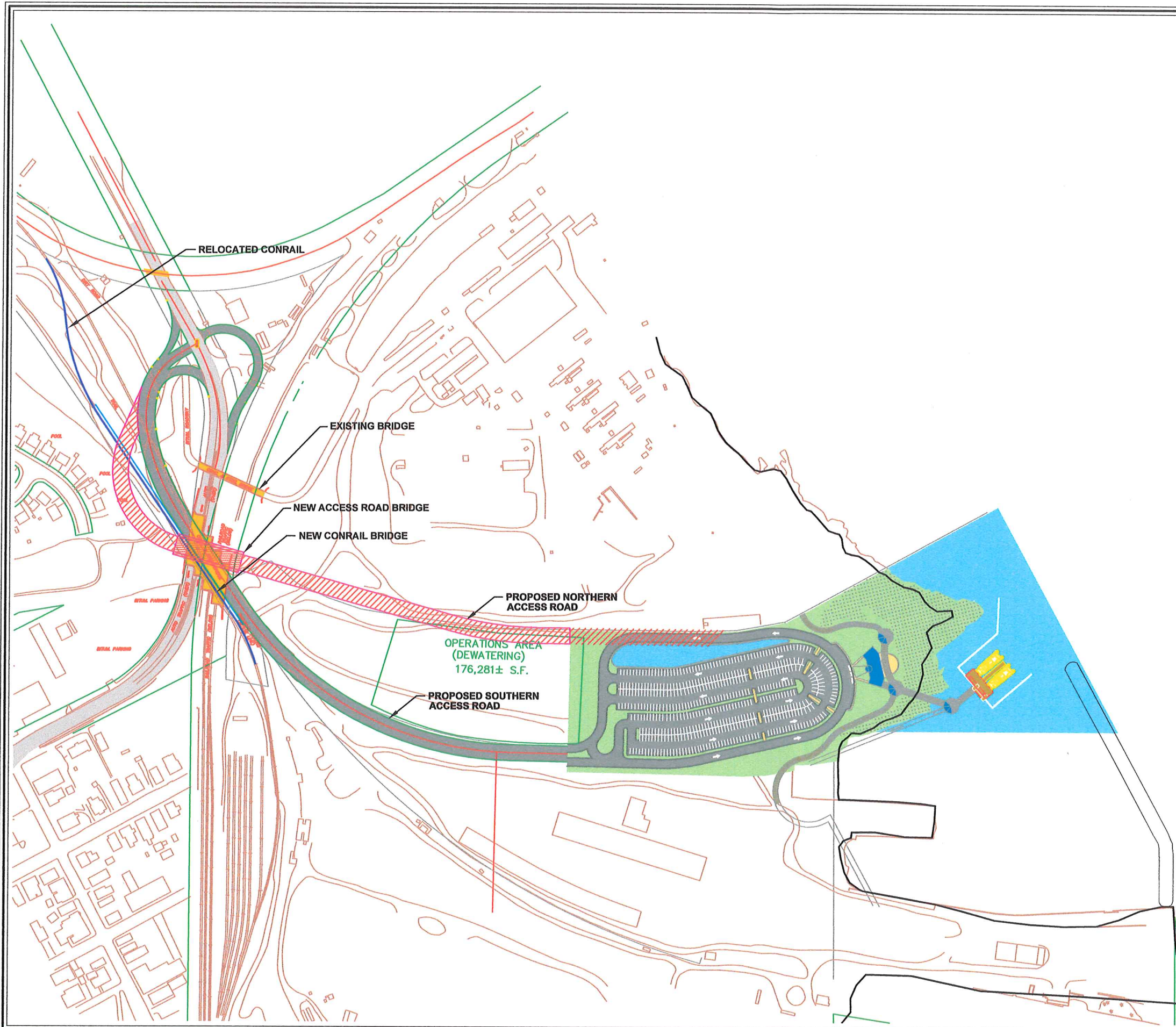
SOURCE: CME ASSOCIATES and HUNTER RESEARCH	FIGURE # 3-7
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DATE	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
<b>ACCESS ROAD ALTERNATIVES</b>				
<b>SOUTH AMBOY FERRY TERMINAL</b>				
<b>SOUTH AMBOY, NEW JERSEY</b>				
SOURCE: CME ASSOCIATES and HUNTER RESEARCH			FIGURE # <b>3-8</b>	
DATE: 3/14/02	DRAWN BY: JFK	REVIEWED BY: DRD	SCALE: AS SHOWN	PROJECT # 413 SHEET # 1 OF 1

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South Amboy, NJ 08879

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Jersey City, NJ 07305

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Suite 3E, POB 1206  
New York, NY 10011

would also be shifted to the south to accommodate the Access Road ramp, which will impact the residences to the south. For these reasons, the alignment was not considered further.

The proposed southern Access Road is the preferred alternative. The Access Road follows the route of an existing unpaved roadway therefore minimizing impacts to the area. The proposed Access Road bridge would be constructed over improved Main Street and NJ Transit with the required underclearances while minimizing impacts to existing residences.

### **3.2.6 Breakwater Alternatives**

Various types of breakwaters were analyzed and considered for the South Amboy ferry project. These types included:

- Rubble-mound breakwater
- Timber wave baffle
- Precast concrete sheet pile breakwater
- Cellular sheet pile (cofferdam) breakwater
- Floating breakwater (proposed action)

A report prepared by the Davidson Laboratory of Stevens Institute of Technology calculated the range of wave energies available at the proposed ferry site and compared these energies through several design storm events. A copy of this report is included in Appendix D, Wave Study.

#### **Rubble-Mound Breakwater**

The rubble-mound breakwater is one of the most effective types in that it can typically absorb 80-90 percent of the wave energy, result in a minimum of reflected energy, and requires little annual maintenance. However, the water depth at the ferry site where the breakwater would be located is greater than 17-feet mean sea level (MSL) at the deepest location. To prevent wave overtopping during a 50-year storm event, the crest elevation of the breakwater should be at least 15 feet above MSL (i.e., accommodating a 10 foot storm surge + 2.5 foot tide + 2.5 foot wave runup).

Thus, the height of the breakwater at its deepest location would be 33-feet. Assuming a crest width of 10-feet and a side angle of repose of 1-foot vertical to 1.5-feet horizontal, the bottom width would be 110-feet wide resulting in an overall bottom footprint of more than 2.5-acres.

Further, the massive size of the rubble-mound breakwater would severely restrict flushing within the semi-enclosed basin and make the installation of flushing culverts difficult to install and maintain.

For these reasons, the rubble-mound breakwater was not considered further.

### **Timber Wave Baffle**

The timber wave baffle is most effective either as a primary barrier across a relatively short fetch or as a secondary protection structure used to damp vessel wakes within a marina-type environment. Overall, it is a somewhat poor wave attenuator and would not be practical for the length of the breakwater required at this site. Additionally, the overall relatively short design life (15 years maximum) and high annual maintenance costs would preclude the use of a timber wave baffle.

### **Sheet Pile Breakwaters**

The cellular sheet pile and precast concrete sheet pile breakwaters all have vertical face alignments. Any vertical structure located in the area would fully reflect the incoming waves without any attenuation, thus creating two directional wave trains in the adjacent navigable channel and potential hazards to the boating public. In many cases, a vertical face could actually amplify the naturally existing waves within the basin to large and longer amplitudes, creating a resonance and standing wave condition that could damage vessels and mooring docks.

Furthermore, vertical faced structures tend to create localized erosion and scouring problems at the toe of their face due to the downflux of energy acting against a vertical edge.

Finally, as with the rubble-mound breakwater, it would subject the enclosed basin to diminished flushing and would require the installation of flushing culverts to achieve adequate circulation.

For these reasons, sheet pile breakwaters were not further considered.

### **Floating Breakwater**

Floating breakwaters have a number of advantages over other types of breakwaters. Because they do not extend as a wall to the substrate, they impart good circulation and flushing to the basins they enclose. Further, they do not contribute to scouring of the substrate, since they are sufficiently elevated from the bottom to preclude significant increases in water velocity and erosion potential.

They can be used under a number of bathymetric and wave energy conditions, with their performance dependent on the ratio of the breakwater width to the wavelength of the wave. Floating breakwaters are generally effective, i.e., a transmission coefficient of less than 50 percent, for breakwater widths greater than one-quarter of the wavelength. For a wave with a period of 4.5 seconds in 18-feet of water, a minimum breakwater width of 20-feet would be required.

Finally, the walls of the floating breakwater can be gently sloped to prevent direct wave reflection and energy amplification.

For these reasons, a floating breakwater is the proposed action alternative.

### **3.3 Summary Comparison of Alternatives**

A summary comparison of the foregoing alternatives is presented in Table 3.1, Summary Comparison of Alternatives. This matrix includes, where appropriate, a determination as to whether the alternative meets the identified project needs, associated environmental impacts, and the alternatives estimated cost.

Table 3.1: Summary Comparison of Alternatives

Alternatives	Description of Alt/Site	Compatible w/ City Plans	Meets Project Needs							Environmental Effects	Construct. Cost <sup>1</sup> (\$)
			Satisfies Ridership Demand	Reduces Roadway Congestion	Improves Air Quality	Provides Environ. Cleanup	Improves Local Economy	Improves Public Access/Safety			
<b>No Build</b>	No ferry development	No	No	No	No	No	No	No	No		
<b>Development Sites</b>											
Site 1	North of NJ Transit Coast Line	No	No	Yes	No	Yes	No	Yes	No	Incompatible w/ NJ Transit crossing	84,414,500
Site 2	Former JCP&L Generating Site	Yes	Yes	Yes	No	Yes	No	Yes	No	Extensive 3-5 yr. cleanup	18,923,250
Site 3	Former Ferry and Rail Site North of McCormick Aggregate	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Adverse effect on Historic District	16,350,750
Site 4	Site South of McCormick Aggregate	No	Yes	Yes	No	Yes	No	Yes	No	Extensive 3-5 yr. cleanup	17,512,250
<b>Ferry Dock Sites</b>											
Location 1	Dock at end of long pier	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Incompatible w/ existing uses	7,571,250



Table 3.1: Summary Comparison of Alternatives (Con't.)

Alternatives	Description of Alt/Site	Compatible w/ City Plans	Meets Project Needs							Environmental Effects	Construct. Cost <sup>1</sup>
			Satisfies Ridership Demand	Reduces Roadway Congestion	Improves Air Quality	Provides Environ. Cleanup	Improves Local Economy	Improves Public Access/Safety			
<b>Ferry Dock Sites</b>											
Location 2	Dock south of Promontory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Least dredging, minor wetland impact	7,792,500
Location 3	Dock at Promontory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Extensive dredging/wetland impact	7,792,500
Location 4	Dock at Shoreline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Most dredging, major wetlands impacts	6,742,500
<b>Main St. Crossings</b>											
Relocated Main St.	Elevated access road, two new bridges	No	Yes	Yes	No Effect	Yes	No Effect	Yes	Yes	Extensive residential impacts	28,238,432
Existing Main St.	Two bridges over Conrail & NJ Transit	No	Yes	Yes	No Effect	Yes	No Effect	Yes	Yes	Extensive residential impacts	23,856,682
Over Relocated Conrail	Two bridges over Conrail & NJ Transit	No	Yes	Yes	No Effect	Yes	No Effect	Yes	Yes	Minor	30,737,932
New Conrail Bridge	Replacement of degraded bridge	Yes	Yes	Yes	No Effect	Yes	No Effect	Yes	Yes	Minor	18,866,182

Table 3.1: Summary Comparison of Alternatives (Con't.)

Alternatives	Description of Alt/Site	Compatible w/ City Plans	Meets Project Needs								Environmental Effects	Construct. Cost <sup>1</sup>
			Satisfies Ridership Demand	Reduces Roadway Congestion	Improves Air Quality	Provides Environ. Cleanup	Improves Local Economy	Improves Public Access/Safety				
<b>Access Road</b>												
Northern	Access Rd. along northern edge of site	No. Engineering constraints on horizontal geometry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Adverse effect on Historic District	2,550,750
Southern	Access Rd. along northern edge of site	Yes.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Adverse effect on Historic District	2,550,750
<b>Breakwaters</b>												
Rubble-Md	Pyramidal stone breakwater	Yes	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	Major benthic impact w/ 2.5-acre footprint, poor circulation within basin	4,816,650
Sheetpile	Cellular steel or concrete wall	Yes	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	Poor circulation, effect on finfish movement, can cause reflected waves	4,309,000

**Table 3.1: Summary Comparison of Alternatives (Con't.)**

Alternatives	Description of Alt/Site	Compatible w/ City Plans	Meets Project Needs							Environmental Effects	Construct. Cost <sup>1</sup>
			Satisfies Ridership Demand	Reduces Roadway Congestion	Improves Air Quality	Provides Environ. Cleanup	Improves Local Economy	Improves Public Access/Safety			
Floating	Pile-supported wood and composite wave attenuator	Yes	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No bottom footprint (except for piles); open circulation, maximum attenuation after rubble-mound design	3,500,000

Source: PHE, 2003

<sup>1</sup> Does not include estimated cost of environmental remediation

## **4.0 AFFECTED ENVIRONMENT**

### **4.1 Geology and Soils**

#### **Existing Conditions**

The USGS Geologic Map of the Newark 1° x 2° Quadrangle, New Jersey, Pennsylvania and New York indicates that the Site is located in the Coastal Plain which consists of gently seaward-sloping surface on poorly consolidated sediments of Tertiary and Cretaceous age (See Figure 4-1, Geologic Map). These rocks form a southeastward-thickening, gently tilted prism of strata that exceeds 2,480 feet in thickness along the coast, and thins to a feather edge along the Fall Line where it unevenly overlaps the Southern Piedmont and Newark Basin. Whereas the oldest Cretaceous clastic sediments are mostly non-marine, the overlying units are mostly marginal marine in origin.

The Soil Survey of Middlesex County, New Jersey has designated the Site as primarily Urban Land (UL) (See Figure 4-2, Soil Survey Map). This unit consists of areas where more than 80 percent of the surface is covered by industrial plant, shopping and business centers, and other structures, and usually located in the highly populated northern half of the country. The areas generally range from 2 to 1,000 acres. Most are nearly level to moderately sloping, but a few are strongly sloping and steep. Fill material has most likely been used to raise the grade of wet soils, and most areas have been excavated or filled.

#### **Environmental Impacts**

The Build alternative would not result in site-specific or regional impacts to geology. Under the Build scenario, portions of the site would be raised to elevation 10.5 or greater.

These changes in topography have the potential to alter local drainage patterns. Because of the overall design of the ferry terminal and parking, which incorporates a range of storm water control devices including two detention basins, the effect of additional storm water release would be minimal.

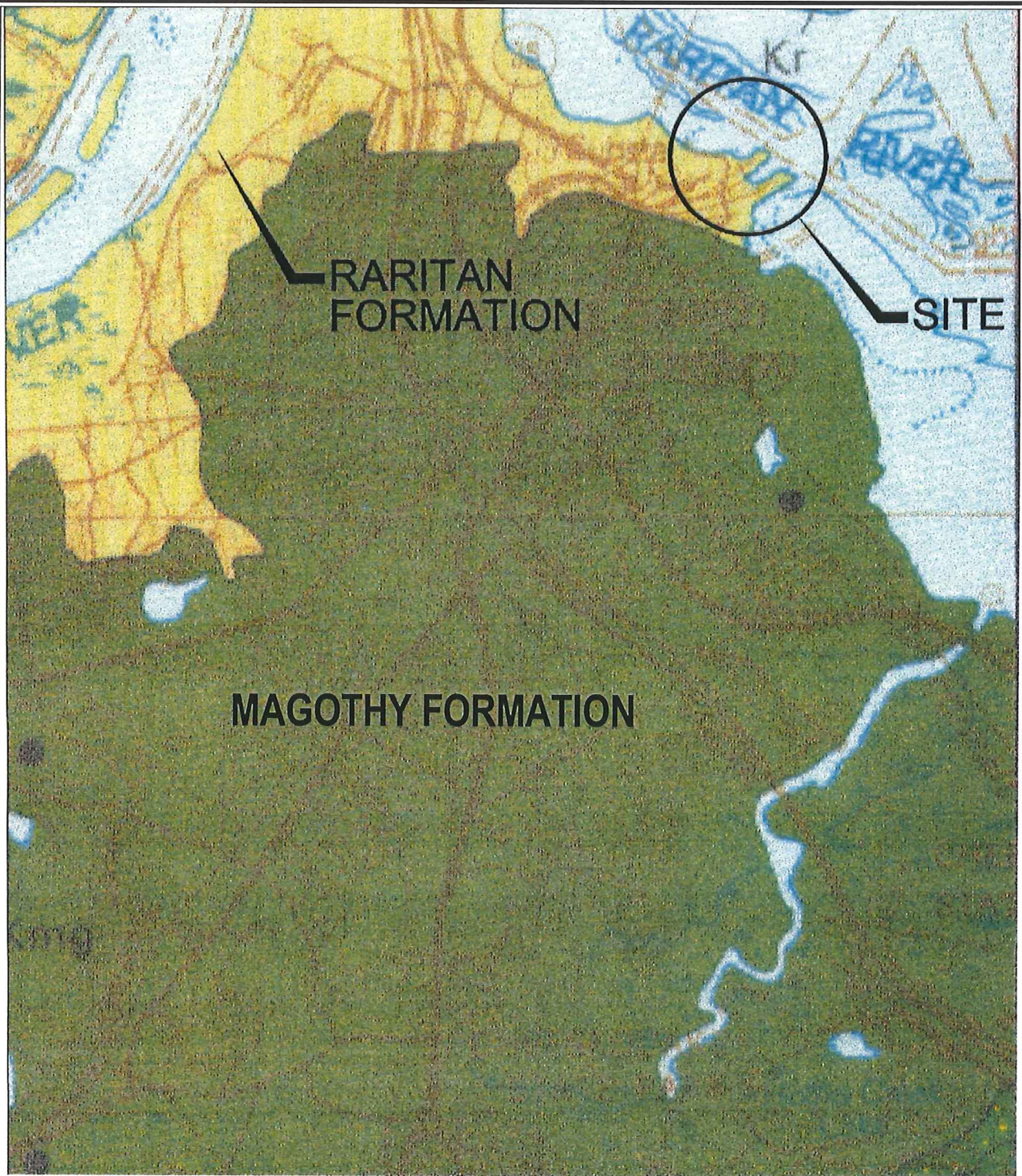
All site preparation and interim construction work would be subject to a Soil Erosion and Sediment Control Plan that would be issued to the developer by the Middlesex County Soil Conservation Service.

### **4.2 Water Resources**

#### **4.2.1 Surface Water**

##### **Existing Conditions**

The site is located within the Raritan Bay at the mouth of the Raritan River. The Raritan River is classified as SE1 waters according to the Surface Water Quality Guide. SE1 waters are saline



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March 2001	MDS	M.J.M.	N/A	39.0413	1 OF 1



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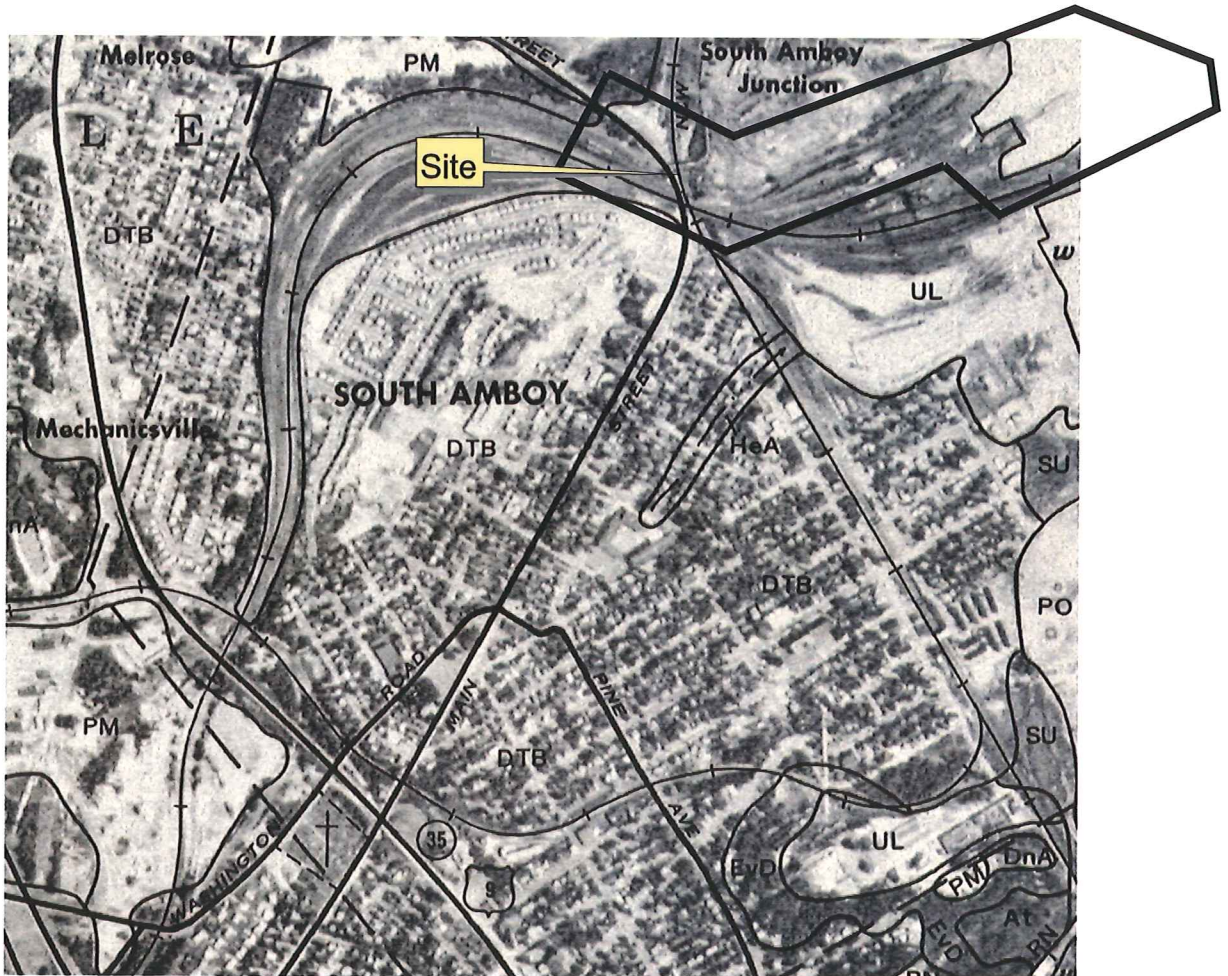
**Geology Map**  
South Amboy Ferry Terminal Project  
City of South Amboy, New Jersey

SOURCE:

PMK Group

FIGURE #

4-1



UL = Urban land  
 PM = Pits, sand and gravel  
 PO = Psammments, sulfidic substratum  
 DTB = Downer-Urban land complex, 0 to 10 percent slopes

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Soil Survey Map  
 South Amboy Ferry Terminal  
 City of South Amboy, New Jersey

SOURCE: Middlesex Cnty. Soil Survey

FIGURE # 4-2

estuarine waters with designated uses such as, shellfish harvesting, primary and secondary contact recreation, and maintenance, migration, and propagation of the natural and established biota. The entire site drains into the Raritan Bay, which is also classified as SE1.

A four-season monitoring program was conducted beginning in the summer 2000 season and continuing through the spring 2001 season. This program included the collection and analysis of water quality samples at multiple depths at six locations: four locations within the ferry basin and one location outside of the basin. Parameters measured included dissolved oxygen (DO), pH, salinity, oxidation-reduction potential, and temperature at critical surface, mid, and bottom depths. Biochemical oxygen demand (BOD, 5-day) and coliforms (total fecal) were collected from the surface depth.

The location of the water quality sampling stations is shown in Figure 4-3, Water Quality Sampling Locations. The results of this program are presented in Table 4.1 and summarized below.

Surface fecal coliform (FC) levels were generally below the applicable SE1 standard of 200 counts/100ml except on one occasion in June 2001. On this occasion, coliform levels at all stations were above the SE1 standard and ranged from 2200 to 3800 counts/100ml. These elevated levels may be related to a significant precipitation event, 0.90 inches of rainfall measured at Newark Airport, the day prior to sampling and with no precipitation for the week prior to that event. For the other three sampling events, coliform levels were either below detection limits or under 50 counts/100ml.



At all depths and at all stations, the dissolved oxygen (DO) levels were above the 4.0 mg/l SE1 standard throughout the one-year monitoring period. As expected, recorded DO levels were lower during the warmer months and with increasing depth. DO levels ranged from a summer seasonal low of 4.6 mg/l to a winter seasonal high of 11.6 mg/l.

### **Environmental Impacts**

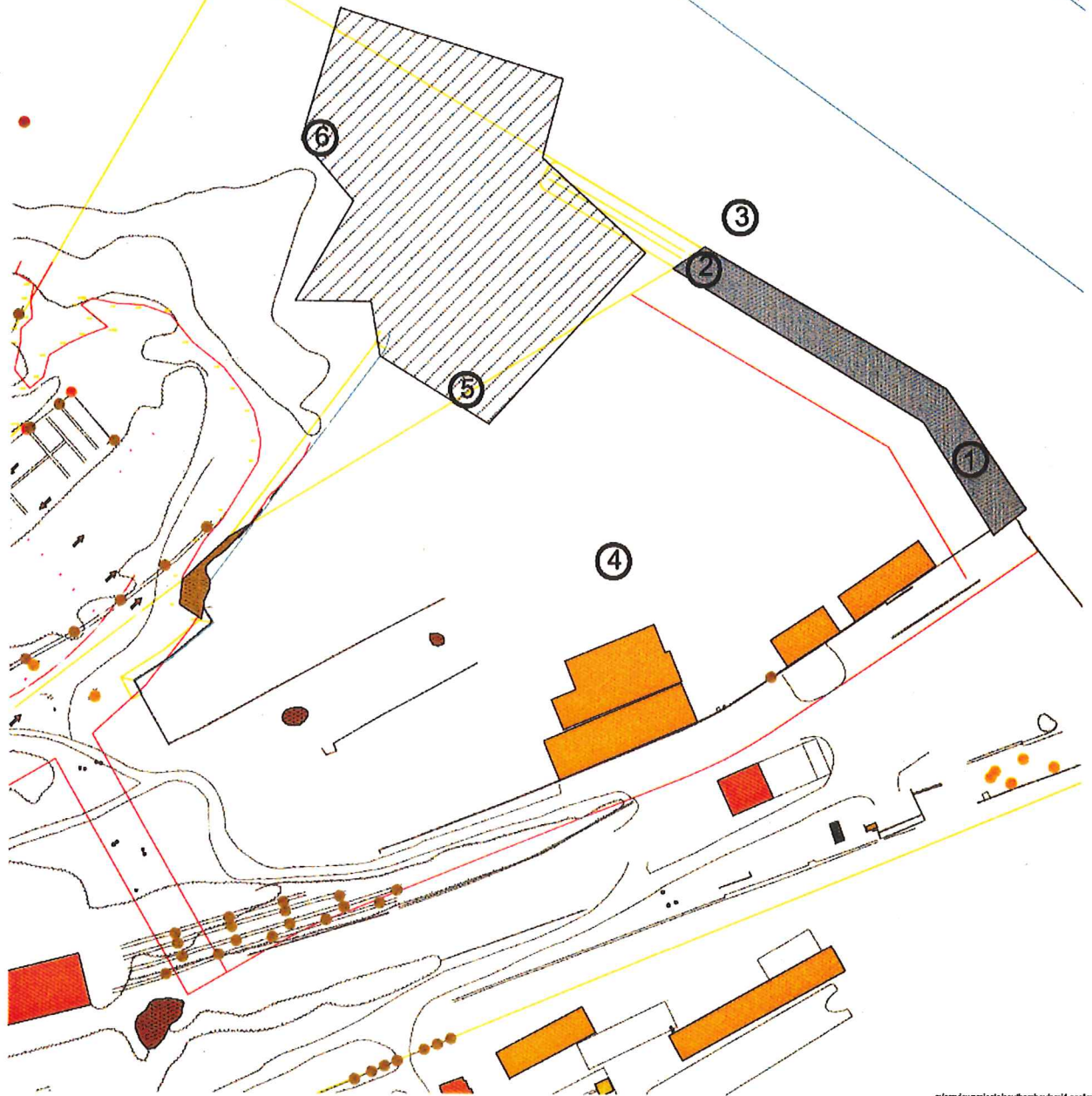
Under the Build alternative, primary impacts to the surface waters of Raritan Bay would occur during the construction phases of the project when dredging and in-water construction occur.

#### ***Dredging***

Dredging of approximately 36,000 cy of sediment would be required to provide adequate depth for the ferry docks and access channel into the docks. Dredging for the marina would take approximately 2-3 weeks using a clamshell-type dredge. Clamshell dredging would result in the suspension of sediment particles within the water column. Although mitigation measures would be employed, including use of dredge buckets that minimize sediment releases, dredging during low tide periods, and the use of partial depth silt curtains to isolate the dredged area from the adjacent waters, some transport of the suspended material into adjacent waters will occur. Given the current directions of the tidal flood and ebb, and the presence of the large pier (McCormick Aggregate) located to the south of the project area that provides a substantial sheltering effect to the site, the amount of material likely to be transported would be small.

	Proposed breakwater
	Proposed dredging

SOUTH AMBOY REACH  
FEDERAL CHANNEL



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DATE: June 2001	DRAWN BY: MDS	REVIEWED BY: MJM	SCALE: 1"=130'	PROJECT # 39.0413	SHEET # 1 OF 1
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Water Quality Sampling Locations  
South Amboy Ferry Terminal Project  
City of South Amboy, New Jersey

SOURCE:  
PHE

FIGURE #  
4-3





**Table 4.1 (continued):  
Water Quality Monitoring Results  
South Amboy Ferry Terminal EA  
South Amboy, New Jersey**

Parameter	Units	Monitoring Stations																		
		1			2			3			4			5			6			
		S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	
Depth	meters	0.5	1.9	4.4	0.5	1.4	2.8	0.5	2.2	4.1	0.5	1.6	2.5	-	0.4	-	-	-	-	0.6
Temperature	°C	6.3	5.7	5.6	6.4	5.7	5.7	6.3	5.7	5.6	6.5	5.8	5.6	-	7.2	-	-	-	-	7.1
Salinity	000	14.1	21.4	22.6	13.6	21.2	21.9	13.8	21.7	22.7	13.0	18.5	22.2	-	11.6	-	-	-	-	10.8
pH		7.90	7.83	7.78	7.90	7.84	7.79	7.90	7.81	7.76	7.90	7.84	7.73	-	7.74	-	-	-	-	7.71
ORP	volts	+0.183	+0.183	+0.180	+0.172	+0.173	+0.170	+0.164	+0.164	+0.162	+0.158	+0.157	+0.157	-	+0.151	-	-	-	-	+0.137
DO	mg/l	10.0	10.3	10.3	10.0	10.5	10.7	10.1	10.5	10.5	10.3	10.4	10.7	-	11.2	-	-	-	-	11.6
BOD5	mg/l	2.3			2.1			<2.0			<2.0			-	<2.0	-	-	-	<2.0	
Fecal Coliforms	Colonies/100 ml	38			32			48			2			-	8	-	-	-	10	

Parameter	Units	Monitoring Stations																		
		1			2			3			4			5			6			
		S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	
Depth	meters	0.4	2.4	4.6	0.3	1.9	3.9	0.6	2.4	4.5	0.6	1.5	2.6	-	0.4	-	-	-	-	0.4
Temperature	°C	22.5	20.7	20.5	21.6	20.8	20.7	22.4	20.9	20.7	21.8	21.1	20.9	-	22.9	-	-	-	-	22.8
Salinity	000	8.5	20.4	21.6	8.4	20.6	21.3	4.8	19.9	21.1	7.5	17.2	20.2	-	4.5	-	-	-	4.4	
pH		7.22	6.82	6.76	7.34	6.92	6.86	7.32	6.99	6.91	7.32	6.99	6.91	-	7.23	-	-	-	7.18	
ORP	volts	+0.231	+0.243	+0.242	+0.255	+0.266	+0.258	+0.276	+0.284	+0.275	+0.304	+0.317	+0.315	-	+0.275	-	-	-	+0.276	
DO	mg/l	5.7	5.2	5.2	5.7	5.0	5.2	5.8	5.2	5.2	5.7	4.6	4.8	-	6.7	-	-	-	6.6	
BOD5	mg/l	45			50			36			39			-	40	-	-	-	35	
Fecal Coliforms	Colonies/100 ml	3400			2600			3000			3600			-	3800	-	-	-	2200	

Source: PHE, Inc., 2001

**Notes**

- Depth: Surface (S) Middle (M) Bottom (B)
- u = Indicates a compound was analyzed for but not detected, M = missing.

### ***Dewatering***

All dredged material would be disposed of in an upland location immediately west of the proposed ferry parking area, as shown in Figure 4-4, Containment Area. An approximately four-acre dredged material containment area would be constructed with an enclosure of berms composed of granular material to promote water filtration. A trench would be located around the outer perimeter of the containment area to collect the filtered water. This trench would, in turn, be connected to a grassed swale that would transport the collected effluent to a retention pond prior to release to the bay.

Dredged material would be placed within the containment area throughout the dredging program. Depending upon such variables as meteorological conditions and material composition, the suspended solids would sufficiently decant within a one- to three-month period.

### ***Pile Driving***

The effect of driving support piles for the ferry dock and associated walkway, and guide piles for the floating breakwater would be minor increases in suspended sediment in the immediate vicinity of the pile. Vibrations set up during the pile-driving activity would result in temporary avoidance of the immediate area by finfish and motile invertebrates.

### ***In-water Structures***

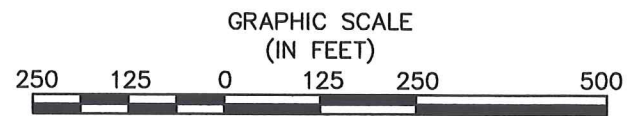
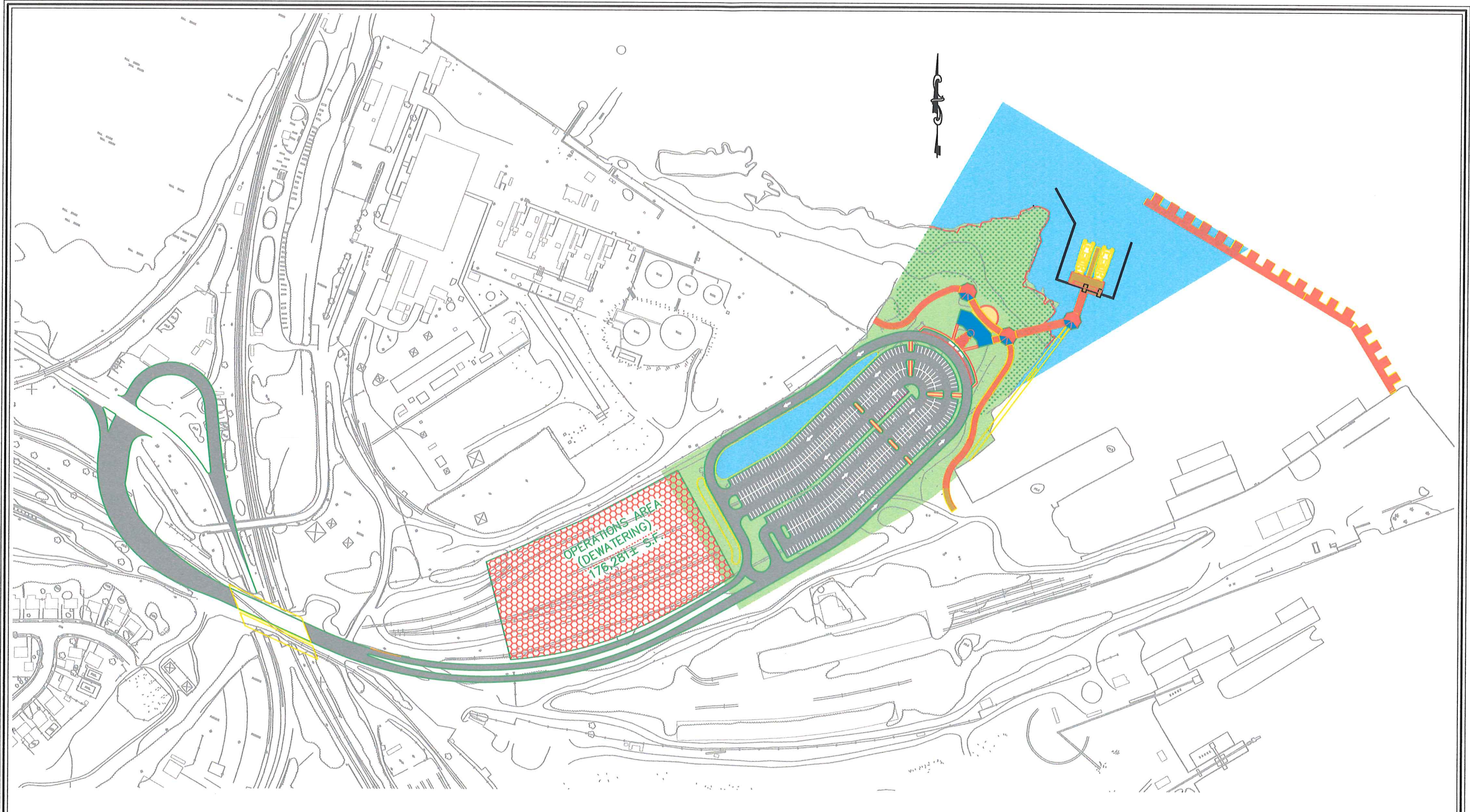
All materials used in the construction of the ferry docks and floating breakwater would be environmentally safe and sustainable resources.

## **4.2.2 Groundwater**

### **Existing Conditions**

Groundwater information was obtained from existing data sources and from previous aquifer studies performed by the Middlesex County Department of Planning. Groundwater is located within interconnected openings formed by joints, fractures, and solution channels based on the underlying geologic formation. South Amboy is situated above the Potomac-Raritan-Magothy aquifer. This aquifer is highly productive and is the most-used confined aquifer in the Coastal Plain sole source aquifer system. This aquifer system extends throughout the Coastal Plain and attains a maximum thickness of 4,100 ft. The Potomac-Raritan-Magothy aquifer is comprised of two aquifers, the Farrington and the Old Bridge aquifers. The project site is situated above the Farrington aquifer, which has excellent water quality but also has large concentrations of iron in some areas. Based upon our analysis, there is no deep aquifer recharge area in the vicinity of the project due to the presence of a confining layer of clay situated approximately 25 feet beneath the sandy soils that exist within the project area (Orndorff, C.R. 1998, Bedrock Geologic Map of Central and Southern New Jersey).

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Containment Area  
South Amboy Ferry Terminal Project  
City of South Amboy, New Jersey

SOURCE:	Operations2.dwg CME Associates (8/27/01)	FIGURE #	4-4
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The groundwater underlying the project area is classified by the NJDEP as Class II-A. The primary use of Class II-A groundwater is potable water. Secondary uses of Class II-A groundwater include agricultural water and industrial water. The two major local rivers (Raritan River and Arthur Kill) function as groundwater discharge points.

See Section 4.8.6 for supplemental information on groundwater quality.

### **Environmental Impacts**

Work for the proposed project will have no adverse impacts on the local and/or regional groundwater. Similarly, due the presence of the confining layer and the small scale of the proposed dredging project, it is unlikely that the proposed project will affect the local groundwater flow regime or increase the occurrence of saltwater intrusion.

#### **4.2.3 Tidal Flood Zone**

##### **Existing Conditions**

Review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the City of South Amboy indicates that the areas of the Site along the waterfront lie within an area of 100-year coastal flooding with velocity, with base flood elevations between 16 and 17 feet. Areas of the Site slightly inland lie within an area of 100-year flood with a base flood elevation between 12 and 13 feet. The remainder of the Site does not lie within a floodplain. This is confirmed by the USGS Flood-prone Maps that indicate the area of the Site along the waterfront lies within a USGS Documented Flood prone Area, and the remainder of the Site does not lie within a Flood prone Area. A representation of the 100-year tidal flood zone is provided as Figure 4-5, 100-Year Flood Map.

##### **Environmental Impacts**

Under the Build alternative, all of the project site area will be raised above the 100-year flood elevation. The project would not affect the 100-year tidal elevations in Raritan Bay. All proposed structures would be constructed above the 100-year tidal flood elevation. The future 100-year flood zone area would be altered by the encroachments since tidal waters would no longer inundate the areas of fill. All changes to the 100-year flood map would be coordinated with the Federal Emergency Management Agency (FEMA).

#### **4.3 Traffic**

##### **4.3.1 Background**

The City of South Amboy proposes an Access Road as a connection between Main Street and the proposed ferry parking area and terminal building along the waterfront. The alignment of the road starts at Main Street with a jug handle for the northbound Main Street traffic to a signalized intersection at the Access Road. The access road will utilize a new bridge structure that follows

the existing alignment of CONRAIL Bridge # 1.98, which spans both Main Street and New Jersey Transit. The Access Road will continue in an easterly direction to the proposed ferry parking and terminal building at the waterfront.

Detailed traffic data, including turning movements and counts, can be found in the Traffic Technical Environmental Study (Vol. II).

#### **4.3.2 Existing Conditions**

To examine the existing traffic conditions in the vicinity of the project area, manual turning movement counts were conducted during the weekday morning and evening peak hours that would be impacted mostly by the proposed ferry service. This analysis has also examined traffic counts previously conducted at several locations within the study area.

New turning movement counts were conducted along Main Street at the Access Road in September 2000. The traffic counts were conducted during the following time periods consistent with typical commuter "rush" hours:

- Weekday 6:00 a.m. to 9:00 a.m.
- Weekday 4:00 p.m. to 7:00 p.m.

The results of these traffic counts indicated that there is a distinct one-hour period in each of these intervals when traffic volumes reached a maximum value. Specifically, a "peak hour" occurred during the morning (7:00 a.m. to 8:00 a.m.) and evening (4:30 p.m. to 5:30 p.m.) periods when traffic volume is highest. The morning peak hour volumes were found to be higher than the evening peak hour volumes. Also the northbound approach to the proposed intersection carried the larger percentage of the traffic volume during both morning and evening peak hours.

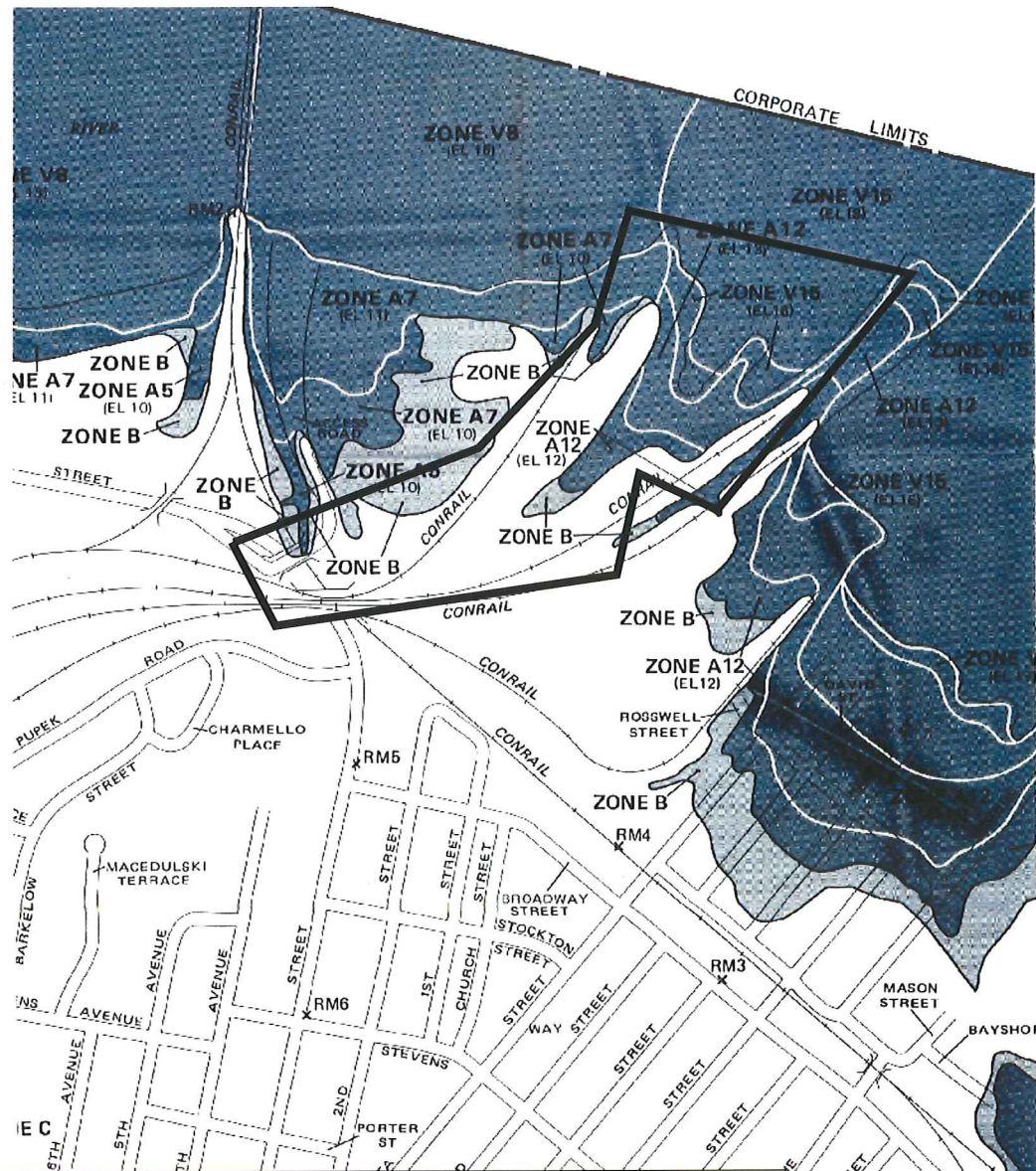
A volume/capacity level of service analysis was conducted for the existing traffic volumes with the existing unsignalized intersection. The existing intersection (No Action scenario) was found to operate at a favorable level of service (LOS A) in the morning and evening peak hours. The estimated average daily traffic (ADT), based upon the peak hour volumes obtained in the field, is 10,500 vehicles.

Existing traffic data can be found in the Traffic Technical Environmental Study (Vol. II).

#### **4.3.3 Future Conditions**

##### **No Build Alternative**

In order to estimate traffic impacts in future years, a "background" growth rate must first be developed. Background growth refers to the increase in traffic volumes associated with the areas surrounding the downtown and waterfront areas within the City of South Amboy and surrounding communities. The background growth can be projected from published growth rates or by comparison of past and present traffic volumes. In order to perform an analysis for Main Street and the proposed Access Road, a 2% per year background growth rate was utilized. This



**A1-A30 - Areas of 100-year flood; base flood elevations and flood hazard factors determined.**

**V1-V30 - Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.**

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SOURCE: FEMA

FIGURE # 4-5

### 100-Year Flood Map South Amboy Ferry Terminal Project City of South Amboy, New Jersey

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rate was applied to the existing volumes to reflect potential background traffic growth, which may occur outside the immediate area.

Existing traffic volumes were projected using a 2% per year compounded background growth rate, as described above, to develop "No Action" traffic volumes for years 2003, 2013 and 2023 during the morning and evening peak hours. The intersection for both the 2003, 2013 and 2023 "no action" morning and evening peak hours will continue to operate at an LOS A.

#### **4.3.4 Proposed Action Alternative**

##### **Year 2003**

A volume/capacity Level of Service analysis was conducted for the projected traffic volumes (2003) with the proposed ferry service and signalized intersection at the Access Road and Main Street using SIGNAL97/TEAPAC computer software. This type of analysis is performed to assess intersection operation and to identify any areas of excess delay or congestion.

The projected traffic movements with a proposed ferry service were found to operate at a favorable Level of Service (LOS B) in the morning peak hour and (LOS B+) in the evening peak hour.

##### **Year 2013**

A traffic volume generation model was created using 2% per year growth rate to the existing volumes servicing the Access Road. These volumes were compared to the projected traffic volumes in the Wallace, Roberts & Todd report, for the central waterfront development. The volumes in both reports were found to be comparable. The central waterfront redevelopment area as outlined in the Wallace, Roberts & Todd report consisted of the following:

- 110 units of mid-rise residential development
- 180,000 SF of commercial development (commuter-oriented retail, supermarket, associated neighborhood retail and waterfront restaurant)
- 300 slip commercial marina with maintenance, repair and boat storage
- Ferry terminal and associated parking

Levels of Service (LOS) analysis were conducted for the build-out traffic volumes at the study intersection utilizing a 2% growth rate. The proposed intersection is expected to continue to operate at a favorable level of service during the study peak hours, although delays may slightly increase to a LOS B during the morning peak hour and LOS C+ during the evening peak hour.

##### **Year 2023**

The traffic volumes were then increased again using a 2% per year growth rate for an additional 10 years (2023) to the traffic volumes servicing the Access Road.



The Levels of Service (LOS) were again analyzed for the increased traffic volumes at the study intersection. The proposed intersection is expected to operate at a favorable level of service (LOS B) for the morning peak hour and LOS D+ for the evening peak hour.

#### **4.3.5 Results**

This analysis has shown that with the Access Road and Main Street improvements, sufficient roadway and intersection capacity will be available to accommodate traffic associated with the proposed South Amboy Ferry Terminal and parking. The level of service will continue to be acceptable for the initial phase of the redevelopment area, specifically for the Central Waterfront Redevelopment area. Once the other areas of the waterfront are developed, it is anticipated that alternate means of access, particularly at the south end of the redevelopment area, will be constructed which should relieve the potential vehicle loadings at the proposed new Access Road.

It should be noted that existing improvements to the Garden State Parkway and Victory Plaza Circle would improve the traffic conditions on Main Street, particularly during the AM peak hour. Main Street northbound is currently being used as a by-pass for the Garden State Parkway traffic. Once these improvements are complete, the traffic demands on Main Street will be reduced which would improve the level of service at the Main Street Access Road intersection.

### **4.4 Air Quality**

#### **4.4.1 Background**

An air quality analysis was undertaken to assess the potential air quality impacts anticipated to result from the proposed construction of the ferry terminal and associated parking lot and access road. The analysis included the effects of mobile source vehicular-related emissions and stationary source emissions from the heating, ventilation, and air conditioning (HVAC) system.

Potential changes in air pollution levels which could affect the community in and around the project area would be related to proposed changes in traffic patterns at the Main Street / New Access Road intersection and introduction of new pollution sources from proposed ferry activities close to sensitive receptors. The new mobile sources would be associated with employee and rider parking as well as the introduction of a new intersection. The sensitive receptors would be the residences located to the south of the project along Pupek Road and the new ferry terminal building. Sidewalk receptors were also analyzed for the quadrants surrounding the four legs of the new intersection. The stationary source would be associated with the operation of the HVAC system.

The mobile source air quality analysis focused on carbon monoxide (CO), the principal pollutant associated with vehicular emissions. Approximately 80% of atmospheric CO emissions are attributable to vehicular sources. These emissions, associated with the incomplete combustion of fossil fuel, tend to increase as vehicle speeds decrease and are maximized during idling and acceleration modes. CO emissions also increase as temperatures lower. Therefore, areas

characterized by low-speed travel and idling during winter temperature regimes represent the area where vehicular CO emissions are highest.

#### **4.4.2 Existing Air Quality**

The New Jersey Department of Environmental Protection (NJDEP) maintains a network of continuous air quality monitoring stations located throughout the State. Several such stations are located within the County of Middlesex and additional stations surrounding the County. Based on air quality data recorded from these monitoring locations, areas within the State of New Jersey are designated attainment or non-attainment status depending upon whether they are in contravention of the State or National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The six specific air pollutants, which are the indicators of overall air quality, are Sulfur Dioxide, Particulates, Carbon Monoxide, Ozone, Nitrogen Dioxide, and Lead. The NAAQS are based both on health effects (for the primary standards) and welfare effects (for the secondary standards). A copy of these standards is presented in Table 4.2.

The NJDEP 1999 Air Quality Report, the latest document as of this writing, indicated that in 1998, all pollutants except Ozone were well below the State and National Ambient Air Quality Standards. Even Carbon Monoxide (CO), which accounted for a number of exceedences in the past, has declined significantly in recent years and did not reach unhealthy levels in 1999. The primary 1-hour standard for Ozone was exceeded at nine of the fourteen monitoring stations in 1999. The secondary 1-hour standard for Ozone was exceeded at all of the State's monitoring locations in 1999 during the summer months. All monitoring stations experienced exceedences of the National 8-hour primary and secondary standard in 1999. Concentrations of priority pollutants have shown a general downward trend over the past decade.

Another measured parameter, known as the Air Quality Index (AQI), is used by the NJDEP to determine unhealthy air quality episodes. In 1999, the Suburban AQI Reporting Region, which contains the City of South Amboy, had 5 days with unhealthy air quality. These episodes were confined mainly to the summer season. This was down from 1998.

#### **4.4.3 Build Alternative Analysis**

##### **Mobile Source**

A microscale CO air quality study was undertaken to assess the impacts of a new ferry terminal to be constructed on the waterfront in South Amboy. The proposed ferry terminal would bring vehicles off of Main Street into a parking lot via a new two-lane access roadway. Specifically, this study addressed the air quality impacts from all vehicle ingress/egress, parking, and loading onto local roadways. Traffic data was provided by CME Associates and is presented in the Traffic Technical Environmental Study.

Vehicular air quality modeling was conducted at five existing residential locations along Pupek Road, which lies just south of the proposed new access roadway. At each residential property, air quality modeling was conducted at the closest property line to the project. For these residential sensitive receptors, the air quality impacts would be primarily from the new access

TABLE 4.2

## AMBIENT AIR QUALITY STANDARDS

<u>Pollutant</u>	<u>Standard</u>	<u>Averaging Period</u>	<u>New Jersey (a)</u>	<u>National (b)</u>
Sulfur Dioxide	Primary	12-month arith. mean	80 ug/m <sup>3</sup> (.03 ppm)	.030 ppm
	Primary	24-hour average	365 ug/m <sup>3</sup> (.14 ppm)	.14 ppm <sup>c</sup>
	Secondary	12-month arith. mean	60 ug/m <sup>3</sup> (.02 ppm)	---
	Secondary	24-hour average	260 ug/m <sup>3</sup> (.10 ppm)	---
	Secondary	3-hour average	1300 ug/m <sup>3</sup> (0.5 ppm)	0.5 ppm <sup>e</sup>
Total Suspended Particulates	Primary	12-month geom. mean	75 ug/m <sup>3</sup>	---
	Primary	24-hour average	260 ug/m <sup>3</sup>	---
	Secondary	12 month geom. mean (d)	60 ug/m <sup>3</sup>	---
	Secondary	24-hour average	150 ug/m <sup>3</sup>	---
Inhalable Particulates (PM10)	Prim. & Sec.	Annual arith. mean	---	50 ug/m <sup>3</sup>
	Prim. & Sec.	24-hour average	---	150 ug/m <sup>3</sup>
Fine Particulates (PM2.5)	Prim. & Sec.	Annual arith. mean	---	15 ug/m <sup>3</sup>
	Prim. & Sec.	24-hour average	---	65 ug/m <sup>3</sup>
Carbon Monoxide	Prim. & Sec.	8-hour average	10 mg/m <sup>3</sup> (9 ppm)	9 ppm (10 mg/m <sup>3</sup> ) (e)
	Prim. & Sec.	1-hour average	40 mg/m <sup>3</sup> (35 ppm)	35 ppm (40 mg/m <sup>3</sup> ) (e)
Ozone	Primary	Max. Daily 1-Hr. Avg.	.12 ppm (235 ug/m <sup>3</sup> )	.12 ppm (235 ug/m <sup>3</sup> ) (f)
	Secondary	1-hour average	.08 ppm (160 ug/m <sup>3</sup> )	.12 ppm (235 ug/m <sup>3</sup> ) (f)
	Prim. & Sec.	8-hour average	---	.08 ppm (160 ug/m <sup>3</sup> ) (g)
Nitrogen Dioxide	Prim. & Sec.	12-month arith. mean	100 ug/m <sup>3</sup> (.05 ppm)	.053 ppm (100 ug/m <sup>3</sup> )
	Prim. & Sec.	3-month average	1.5 ug/m <sup>3</sup>	---
Lead	Prim. & Sec.	Quarterly Mean	---	1.5 ug/m <sup>3</sup>

Source: Air Quality Report, NJDEP, Bureau of Air Monitoring.

a) New Jersey short-term standards are not to be exceeded more than once in any 12-month period.

b) National short-term standards are not to be exceeded more than once in a calendar year.

c) National standards are block averages rather than moving averages.

d) Intended as a guideline for achieving short-term standard.

e) National secondary standards for carbon monoxide have been dropped.

f) Maximum daily 1-hour averages: averaged over a three-year period the expected number of days above the standard must be less than or equal to one.

g) This standard is met when the 3-year average of the fourth highest daily maximum 8-hour average is less than or equal to .08 ppm. This new standard became effective September 18, 1997.

roadway. Air quality modeling was also conducted at the sidewalk locations of the four quadrants surrounding the proposed new intersection of Main Street and the new access roadway. To assess the impacts of the proposed new parking lot, a receptor was modeled at the building setback location of the proposed ferry terminal. Modeling locations are shown on Figures 4-6 and 4-7. These modeling locations were chosen to represent highest expected impact levels from the proposed project.

The weekday AM and PM peak hour periods were determined to have the highest traffic impacts from the project. Therefore, both peak periods were analyzed. In addition, both the Estimated Time of Completion (ETC) year of 2003, ETC+10 year of 2013, and Design Year (ETC+20) of 2023 were analyzed for both the "No Build" and "Proposed Action" scenarios. The "No Build" scenario was analyzed for purposes of comparison. Procedures outlined in the New Jersey Department of Environmental Protection (NJDEP) Air Quality Analysis document (dated November 1996) were used for this air quality study.

Idle and free-flow vehicular emission factors were obtained from the NJDEP modified MOBILE 5A-H computer model (USEPA), which were specifically tailored to account for New Jersey inspection maintenance (I/M) programs. This model provides emission factors based on varying vehicular characteristics such as the operating mode of the vehicle (hot/cold start percentages), specific vehicular mixes, speed, temperature, and year. CO emission factors were calculated for winter conditions when internal combustion engines produce greater quantities of CO and air pollutant dispersion characteristics are reduced.

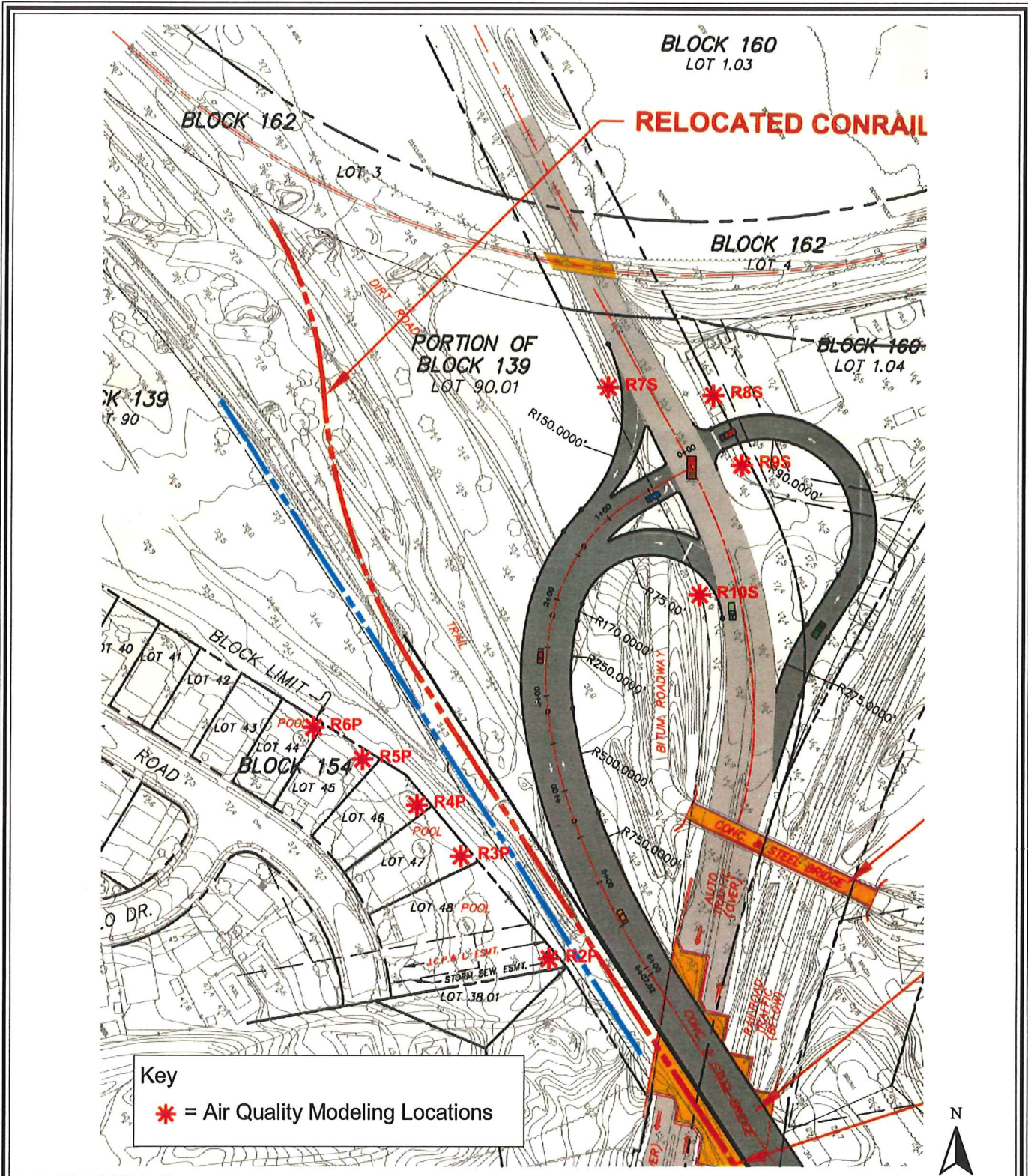
The dispersion (microscale) model that was used for this study was the USEPA's Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections (CAL3QHC). CAL3QHC is a PC-based modeling methodology developed to predict the level of CO or other inert pollutant concentrations from both moving and idling motor vehicles. A "wind sensitivity" analysis was run for various wind angles to determine which conditions result in the highest downwind CO concentrations at each of the selected receptors.

For comparison to State and Federal Air Quality Standards, CO concentrations are determined for the peak hour and 8-hour time periods. The peak hour CO concentration is determined from the modeling itself, while the 8-hour CO concentration is determined by multiplying the peak hour value by a persistence factor of 0.7. This persistence factor represents a combination of the variability in both traffic and meteorological conditions. Background or ambient CO concentrations are then added to the modeled CO concentrations. Background CO concentrations are obtained from a nearby representative station in the NJDEP monitoring network. The Perth Amboy station was selected for use in this study.

A detailed description of the air modeling program can be found in the Air Quality Technical Environmental Study (Vol. II).

### **Stationary Source**

The proposed building will be heated by a natural gas-fired HVAC system. The unit will be energy-efficient and will be under service contract to assure peak performance. The major



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DATE: June 2001	DRAWN BY: MDS	REVIEWED BY: MJM	SCALE: 1"=140'	PROJECT # 39.0413	SHEET # 1 OF 1
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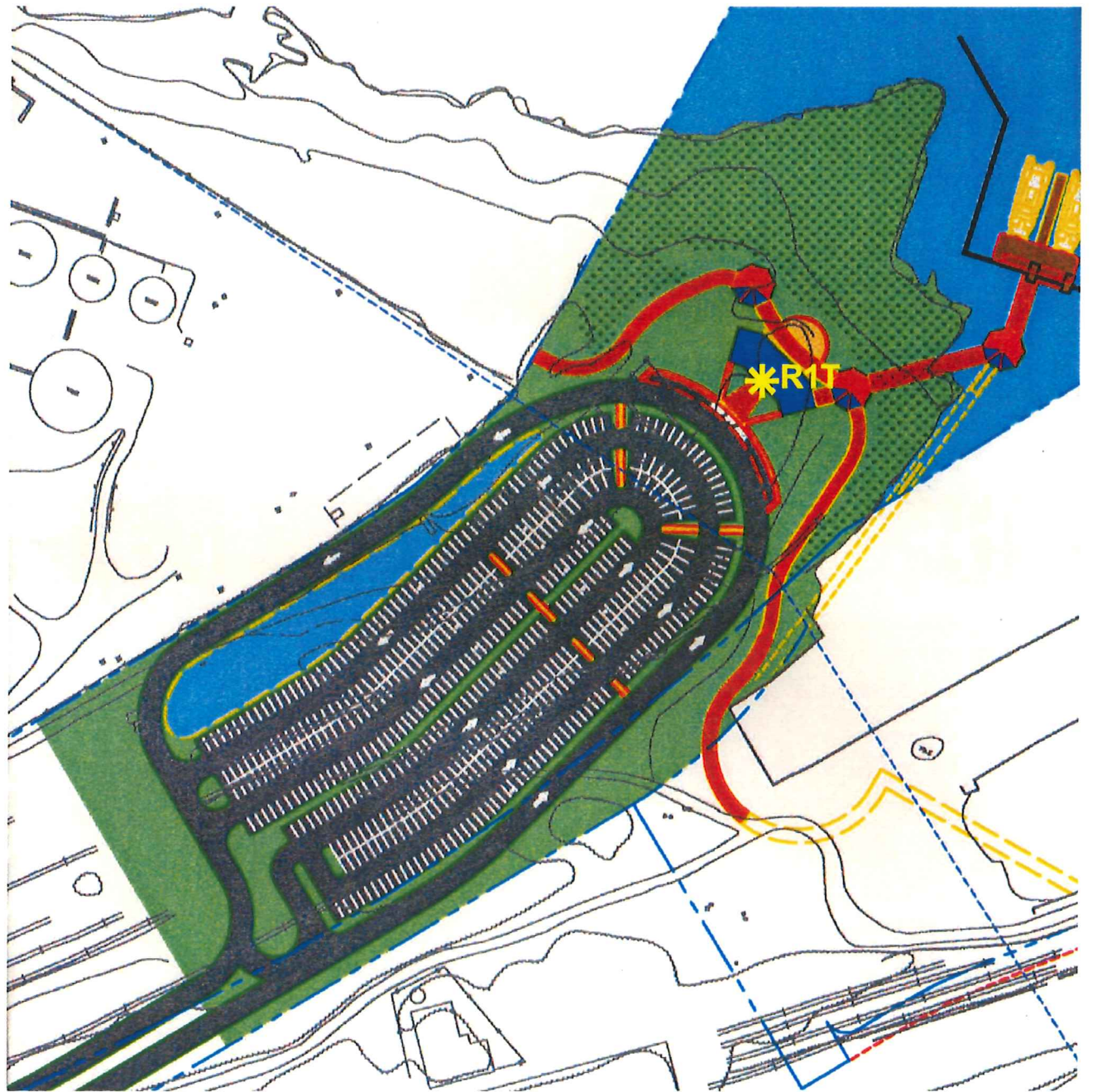
166 John Street  
 PO Box 7  
 South Amboy, NJ 08879

23 Chapel Avenue  
 Jersey City, NJ 07305

136 W. 16th Street  
 Suite 3E, POB 1206  
 New York, NY 10011

**Air Quality Modeling Locations  
 South Amboy Ferry Terminal Project  
 South Amboy, New Jersey**

SOURCE: PHE	FIGURE # 4-6
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**Key**  
 \* = Air Quality Modeling Locations

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DATE:	DRAWN BY:	REVIEWED BY:	SCALE:	PROJECT #	SHEET #
June 2001	MDS	MJM	1"=200'	39.0413	1 OF 1



**POTOMAC-HUDSON ENVIRONMENTAL, INC.**

166 John Street  
 PO Box 7  
 South Amboy, NJ 08879

23 Chapel Avenue  
 Jersey City, NJ 07305

136 W. 16th Street  
 Suite 3E, POB 1206  
 New York, NY 10011

SOURCE:

PHE

FIGURE #

4-7

**Air Quality Modeling Locations (cont.)**  
 South Amboy Ferry Terminal Project  
 City of South Amboy, New Jersey

pollutant of concern when burning natural gas is nitrogen oxides. Nitrogen oxide emissions are functions of combustion chamber temperature, combustion product cooling rate, and the local characteristics of the natural gas consumed.

#### **4.4.4 Air Quality Modeling Results**

##### **Mobile Source**

The results of the dispersion modeling (microscale) analysis for both the “No Build” and “Proposed Action” scenarios and for both peak time periods are presented in the following Tables 4.3, 4.4 and 4.5. It should be noted that these results are based on worst case parameters including peak hour traffic, winter temperatures, wind angle, and idling vehicles, calculated to achieve the highest predicted CO concentration at each sensitive receptor.

**Table 4.3: South Amboy Ferry Terminal EA  
ETC Year 2003 CO Concentration (in ppm)\***

Recept ID	Description	AM Peak Period				PM Peak Period			
		1-Hour		8-Hour		1-Hour		8-Hour	
		No Build	Prop Action	No Build	Prop Action	No Build	Prop Action	No Build	Prop Action
R1T	New Ferry Terminal Building	3.9	3.9	2.8	2.8	3.9	3.9	2.8	2.8
R2P	Residential Property Line Block 154, Lot 48	4.1	4.2	2.9	3.0	4.1	4.2	2.9	3.0
R3P	Residential Property Line Block 154, Lot 47	4.0	4.1	2.9	2.9	3.9	4.1	2.8	2.9
R4P	Residential Property Line Block 154, Lot 46	4.0	4.0	2.9	2.9	3.9	4.0	2.8	2.9
R5P	Residential Property Line Block 154, Lot 45	4.0	4.0	2.9	2.9	3.9	4.0	2.8	2.9
R6P	Residential Property Line Block 154, Lot 44	4.0	4.0	2.9	2.9	3.9	4.0	2.8	2.8
R7S	Sidewalk Southwest Corner	4.4	4.7	3.2	3.4	4.3	4.6	3.1	3.3
R8S	Sidewalk Northwest Corner	4.7	6.2	3.4	4.3	4.5	6.5	3.2	4.6
R9S	Sidewalk Northeast Corner	4.7	5.5	3.4	3.9	4.6	5.2	3.3	3.7
R10S	Sidewalk Southeast Corner	4.2	4.7	3.0	3.4	4.2	4.8	3.0	3.4

Source: PHE, Inc., 2002

\* Inclusive of ambient CO concentration, NJDEP Perth Amboy monitoring station.



**Table 4.4: South Amboy Ferry Terminal EA  
ETC+10 Year 2013 CO Concentration (in ppm)\***

Recept ID	Description	AM Peak Period				PM Peak Period			
		1-Hour		8-Hour		1-Hour		8-Hour	
		No Build	Prop Action	No Build	Prop Action	No Build	Prop Action	No Build	Prop Action
R1T	New Ferry Terminal Building	3.7	3.7	2.6	2.6	3.7	3.7	2.6	2.6
R2P	Residential Property Line Block 154, Lot 48	3.9	4.0	2.7	2.8	3.9	4.0	2.7	2.8
R3P	Residential Property Line Block 154, Lot 47	3.8	3.9	2.7	2.7	3.7	3.9	2.6	2.7
R4P	Residential Property Line Block 154, Lot 46	3.8	3.9	2.7	2.7	3.7	3.9	2.6	2.7
R5P	Residential Property Line Block 154, Lot 45	3.8	3.8	2.7	2.7	3.7	3.8	2.6	2.7
R6P	Residential Property Line Block 154, Lot 44	3.8	3.8	2.7	2.7	3.7	3.8	2.6	2.7
R7S	Sidewalk Southwest Corner	4.2	4.5	3.0	3.2	4.1	4.4	2.9	3.1
R8S	Sidewalk Northwest Corner	4.5	5.8	3.2	4.1	4.2	6.2	3.0	4.4
R9S	Sidewalk Northeast Corner	4.5	5.4	3.2	3.8	4.3	5.0	3.1	3.5
R10S	Sidewalk Southeast Corner	4.0	4.5	2.8	3.2	4.0	4.6	2.8	3.2

Source: PHE, Inc., 2002

\* Inclusive of ambient CO concentration, NJDEP Perth Amboy monitoring station.

**Table 4.5: South Amboy Ferry Terminal EA  
Design (ETC+20) Year 2023 CO Concentration (in ppm)\***

Recept ID	Description	AM Peak Period				PM Peak Period			
		1-Hour		8-Hour		1-Hour		8-Hour	
		No Build	Prop Action	No Build	Prop Action	No Build	Prop Action	No Build	Prop Action
R1T	New Ferry Terminal Building	3.6	3.6	2.6	2.6	3.6	3.6	2.6	2.6
R2P	Residential Property Line Block 154, Lot 48	3.8	3.9	2.7	2.8	3.8	3.9	2.7	2.8
R3P	Residential Property Line Block 154, Lot 47	3.7	3.8	2.7	2.7	3.6	3.8	2.6	2.7
R4P	Residential Property Line Block 154, Lot 46	3.7	3.8	2.7	2.7	3.6	3.8	2.6	2.7
R5P	Residential Property Line Block 154, Lot 45	3.7	3.8	2.7	2.7	3.6	3.8	2.6	2.7
R6P	Residential Property Line Block 154, Lot 44	3.7	3.7	2.7	2.7	3.6	3.8	2.6	2.7
R7S	Sidewalk Southwest Corner	4.1	4.4	3.0	3.2	4.0	4.4	2.9	3.2
R8S	Sidewalk Northwest Corner	4.4	5.9	3.2	4.2	4.2	6.3	3.0	4.5
R9S	Sidewalk Northeast Corner	4.4	5.5	3.2	3.9	4.3	5.0	3.1	3.6
R10S	Sidewalk Southeast Corner	3.9	4.4	2.8	3.2	3.9	4.6	2.8	3.3

Source: PHE, Inc., 2002

\* Inclusive of ambient CO concentration, NJDEP Perth Amboy monitoring station.

Comparison of the modeled results to the CO 1-hour and 8-hour New Jersey and National Ambient Air Quality Standards of 35 ppm and 9 ppm, respectively, indicate that all of the modeled receptors were well below the standard for all modeled time periods and for both the No Build and Proposed Action scenarios. The Proposed Action scenario does, however, selectively result in slightly increased CO concentrations at certain receptors. NJDEP has identified “de minimus” thresholds of 1.6 ppm for the 1-hour and 0.4 ppm for the 8-hour time periods, if the project indicates the potential for future exceedances of the 1-hour and 8-hour standards of 35 and 9 ppm. An air quality impact is considered significant if these de minimus thresholds are exceeded. Based on the fact that future predicted air quality levels from the proposed ferry terminal do not approach these criteria, the project would not significantly impact air quality.

For the majority of receptors, the primary source of CO pollution came from vehicular emissions at the intersection of Main Street / New Access Road. Parking lot emissions did not have a significant effect on nearby receptors due mainly to the source/receptor distances involved.

### **Stationary Source**

Natural gas is one of the cleanest burning fuels used for heating of domestic and small commercial buildings. Typical domestic natural gas-fired HVAC systems generate 0.0001 lb/cu ft, or less, of nitrogen oxide.

The stationary pollutant emissions from the proposed ferry terminal building would be comparable to that of surrounding residences. Due to the new technology and efficiency of the natural gas-fired HVAC unit to be installed in the proposed ferry terminal building, stationary pollutant emissions from the terminal would be insignificant. In addition, the large source/receptor distances would provide further mitigation.

Since natural gas will be used as fuel, projected annual emissions of particulates will be negligible and emission of nitrogen oxides (NO<sub>x</sub>) would be less than the threshold for air quality review of stationary sources.

#### **4.4.5 Conformity Determination**

The USEPA promulgated the Transportation Conformity Rules (TCR) under the Clean Air Act Amendments (CAAA). The TCR provides criteria and procedures for Determining Conformity to State Implementation Plans (SIP) of transportation plans, programs, and projects funded or approved under Title 23USC or the Federal Transit Act. This project is located in an Ozone nonattainment area and, hence, conformity determination is required.

The South Amboy Intermodal Transportation Center project is included in the Fiscal Years 2003 – 2005 Statewide Transportation Improvement Program (STIP), Fiscal Year 2002 Transition List. The results of the CO analysis indicate that the CO concentrations will be well below the NAAQS of 1-hour 35 ppm and 8-hour 9 ppm. This project, therefore, conforms to the goals set forth in the Clean Air Act Amendments of 1990 and the Final Conformity Rule.

#### **4.4.6 Construction Impacts**

A temporary increase in air pollution would occur from suspended particulate matter (fugitive dust), particularly during clearing and excavation activities at the Site. Ground clearing activities should be minimal at the Site due to the "construction - ready" nature of the existing ground. Mitigative measures, such as the application of pallatives or the speed restriction of heavy-duty equipment on unpaved surfaces, could also be applied to further reduce fugitive particulate emissions to adjacent areas. Due to the size and phasing of the proposed project, fugitive dust is not anticipated to have a significant impact on air quality.

### **4.5 Noise**

#### **4.5.1 Existing Noise Conditions**

##### **Background**

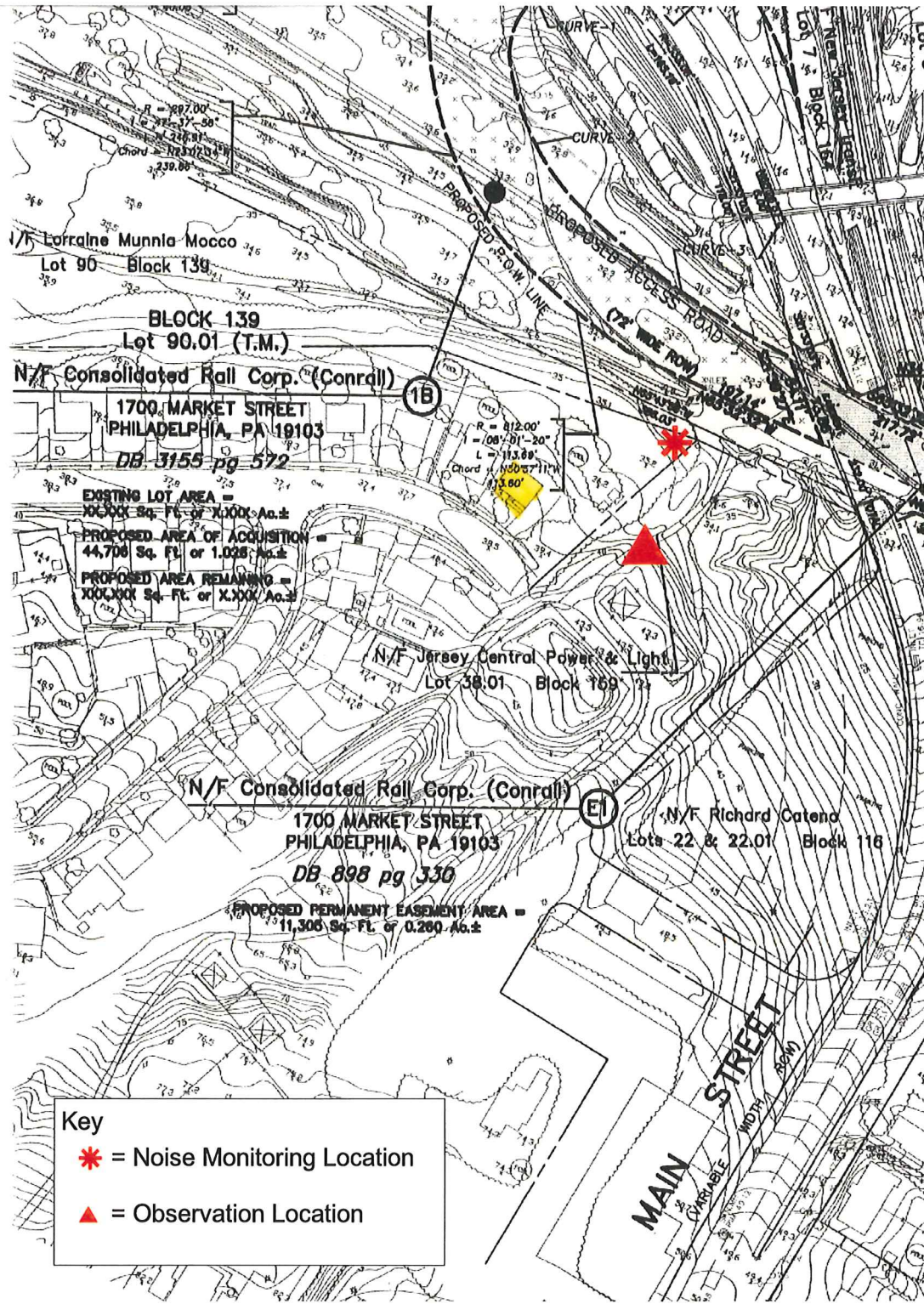
A noise monitoring study was conducted to determine the existing noise characteristics of the project area anticipated to be affected by development of the ferry operation. Specifically, the noise study was designed to (i) collect noise measurements representative of the exposure of adjacent residential receptors to noise levels generated by existing vehicular activities and (ii) use the monitored noise data as a measurement of ambient (i.e., No Build) noise levels.

The study was designed to reflect the collection of noise measurements during both the most sensitive time periods (i.e., nighttime) and time periods with the most vehicular activity (i.e., peak hour). The ambient noise measurement study was conducted for a consecutive 49-hour time period in order to minimize the possibility of anomalous noise events. A site reconnaissance was conducted prior to the initiation of our noise monitoring to (i) help facilitate proper placement of the noise instrument, (ii) obtain an understanding of the neighborhood layout, and (iii) observe periods of vehicular activity, particularly with respect to the truck travel across the ConRail bridge related to McCormick Aggregate. McCormack personnel were not provided notification of the monitoring schedule so as to avoid modification in their operations. In the design and conduct of this noise study reflected, to the extent possible, the intent of the most current New Jersey Department of Environmental Protection (NJDEP) Model Noise Control Ordinance and the City of South Amboy Noise Code.

A detailed description of the noise monitoring program is presented in the Noise Technical Environmental Study (Vol. II).

##### **Program Description**

Determination of existing noise conditions consisted of monitoring noise sources at ground level (i.e., microphone elevation at 5 feet) along the McCormack access road boundary and the residence located at 96 Pupek Road (see Figure 4-8, Noise Monitoring Locations). A location was selected that provided maximum exposure to noise sources, yet was representative of residential sensitive receptor property boundaries.



**Key**  
 \* = Noise Monitoring Location  
 ▲ = Observation Location

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DATE:	DRAWN BY:	REVIEWED BY:	SCALE:	PROJECT #	SHEET #
June 2001	MDS	MJM	1"=140'	39.0413	1 OF 1



166 John Street  
 PO Box 7  
 South Amboy, NJ 08879

23 Chapel Avenue  
 Jersey City, NJ 07305

136 W. 16th Street  
 Suite 3E, POB 1206  
 New York, NY 10011

**Noise Monitoring Location**  
 South Amboy Ferry Terminal Project  
 City of South Amboy, New Jersey

SOURCE:

PHE

FIGURE #

4-8

Monitoring was conducted during weekday periods representative of “typical” conditions. The time periods monitored were from 2:00 PM on Tuesday, 7 November 2000 until 2:42 PM on Thursday, 9 November 2000. Several adjacent neighbors had been previously consulted to identify the times at which peak yard activities occur and the times when most of the noise complaints were lodged. Monitored noise data was collected (i.e., datalogged) in 60-minute time increments.

Ambient noise monitoring was conducted using all Type 1 instruments. The entire monitoring system was calibrated prior to and checked after each monitoring session, and set to a “fast” time constant and A-weighting. All instrumentation had a valid and dated factory certification. All measurement procedures conformed to the American National Standards Institute (ANSI) and Federal Highway Administration (FHWA) requirements. Concurrent with noise measurements, monitoring personnel recorded meteorological parameters, obtained photographic records, and noted the character of the noise source. Noise descriptors measured included the Leq(h), Lmax, L1, L5, L10, L50, L90, L95, and L99 (e.g., L10 = noise level exceeded 10% of the time). For this particular study, the most important recorded components of noise were the Leq(h) and Lmax(h). The Leq(h) is the “average” noise descriptor, measured over 1-hour, which more heavily weighs louder sounds. The Lmax(h) is the “maximum” noise descriptor recorded during the specified time interval (1 hour in this case).

### **Field Observations**

From the standpoint of the affected residential receptors, the McCormack operation consisted of heavy-duty dump truck pass-bys on the adjacent access roadway. Due to the City’s Noise Code and a history of residential complaints, the McCormack operation does not start until after 7:00 AM on weekdays and occasionally on Saturdays. The trucks tend to queue on the Main Street right-of-way prior to 7:00 AM in an effort to be first in line. Truck activity drops off after 5:00 PM. A nearly steady stream of heavy-duty vehicles (HDV) were observed on the access road between the hours of 7:00 AM and approximately 5:00 PM during the three days PHE personnel were on site. The HDVs were primarily the traditional construction-type dump trucks, with a few container-type trucks mixed in. Vehicle speeds were varied, ranging from approximately 10 to 25 mph, but averaging approximately 20 mph. Traffic counts on the access road are presented in the Noise Technical Environmental Study.

During the 49-hour monitoring session, weather parameters remained within acceptable limits for noise monitoring. Conditions ranged from clear to mostly cloudy, temperatures ranged from 41° F to 62° F, relative humidity ranged from 44% to 79%, and wind speeds ranged from calm to 10 mph (variable directions).

### **Noise Monitoring Results**

Detailed results of the ambient noise monitoring study are presented in the Noise Technical Environmental Study (Volume II). The most important recorded components of the noise monitoring data were the Leq(h) and Lmax(h).

For the entire 49-hour monitoring period, the Leq(h) ranged from 45.6 dBA, between midnight and 1:00 AM on 9 November, to 64.8 dBA, between 12:00 noon and 1:00 PM on 9 November. The Lmax(h) ranged from 57.7 dBA, which occurred between midnight and 1:00 AM on 9 November, to 87.5 dBA, which occurred between 11:00 AM and 12:00 noon on 9 November. The Lmax(h) rarely dropped below 65 dBA, even during nighttime hours.

### **Comparison to Noise Standards**

The noise standard adopted by the City of South Amboy (South Amboy Noise Code, Chapter 97, dated 25 May 1991), specifies a maximum permissible sound level of 50 dBA between the hours of 10:00 PM and 7:00 AM, and 65 dBA between the hours of 7:00 AM and 10:00 PM. These permissible noise levels refer to a residential receiving property with a commercial/industrial noise source, as is the scenario for this study.

At all times during the monitoring session, the maximum permissible sound levels of 50 dBA (10:00 PM to 7:00 AM) and 65 dBA (7:00 AM to 10:00 PM) were exceeded. There were even occasions when the Leq(h) noise level exceeded the maximum permissible sound level of 50 dBA during the 10:00 PM to 7:00 AM time period.

A comparison to FHWA and NJDOT Noise Standards is covered in Section 5.5.4 for future scenarios.

## **4.5.2 Project Build Conditions**

### **Background**

To some degree, roadway generated noise affects virtually every environment. Actual levels of roadway-generated noise will vary with traffic conditions, and by particular vehicle types. Automobiles are often not the greatest factor controlling peak noise levels. Heavy trucks and buses can, in many cases, be the primary contributors to high ambient noise levels. Exhaust, engine, and tire noises are the primary sources of the high noise levels associated with heavy vehicles. This problem is compounded whenever these vehicles are traveling up a grade.

The effects of roadway-generated noise can best be evaluated through an analysis of the impacts it will have on different human activities. Generally, residential uses will be one of the most sensitive to interference caused by high noise levels. The extent to which annoyance to noise levels will be perceived is contingent upon the existing background or ambient noise level. Variations which will create large increases or peaks in background noise levels will be perceived with much more annoyance than those that will blend with the existing background noise levels.

The standard measurement unit of noise is the decibel (dB), generally adjusted to the A-scale (dBA), which corresponds to the frequency response of an average human ear when listening to ordinary, everyday sounds. The A-scale frequency weighting de-emphasizes the noise contribution from the lower frequency noise component and emphasizes the higher frequency noise component where the human ear is most sensitive. Most people can just detect sound level

changes of 3 dB outside a controlled laboratory environment, where a 5 dB change is more readily noticeable. A 10 dB change in sound is usually judged as a doubling (or halving) of sound.

### **Noise Modeling Program**

To estimate noise impacts to the nearby residences on Pupek Road due to the proposed construction of a new access road to the ferry terminal, a noise modeling program was conducted. This program utilized STAMINA 2.0, a Federal Highway Administration (FHWA) Level 2 highway traffic noise prediction model. STAMINA 2.0 calculates noise levels along roadway segments using vehicular volumes and speeds and adjusts the noise levels by incorporating vehicular type and roadway grade. The model also calculates noise attenuation by incorporating reflective and absorptive barriers, ground cover, and atmospheric absorption.

Traffic data was provided by CME Associates (see “Traffic Impact Analysis for City of South Amboy, Access Road and Ferry Terminal”, December 2002, as presented in the Traffic Technical Environmental Study, Volume II). Noise modeling was conducted at five existing residential locations along Pupek Road, which lies just south of the proposed new access roadway. At each residential property, noise modeling was conducted at the closest property line, and at residential setbacks at multiple heights to simulate 1st floor and 2nd floor elevations. Modeling locations are shown on Figure 4-9, Noise Modeling Locations. These modeling locations were chosen to represent highest expected noise levels at sensitive residential receptors affected by vehicular noise (primarily the new access roadway) and correspond to one of the monitoring locations (see Section 4.5.1, Noise Monitoring Program).

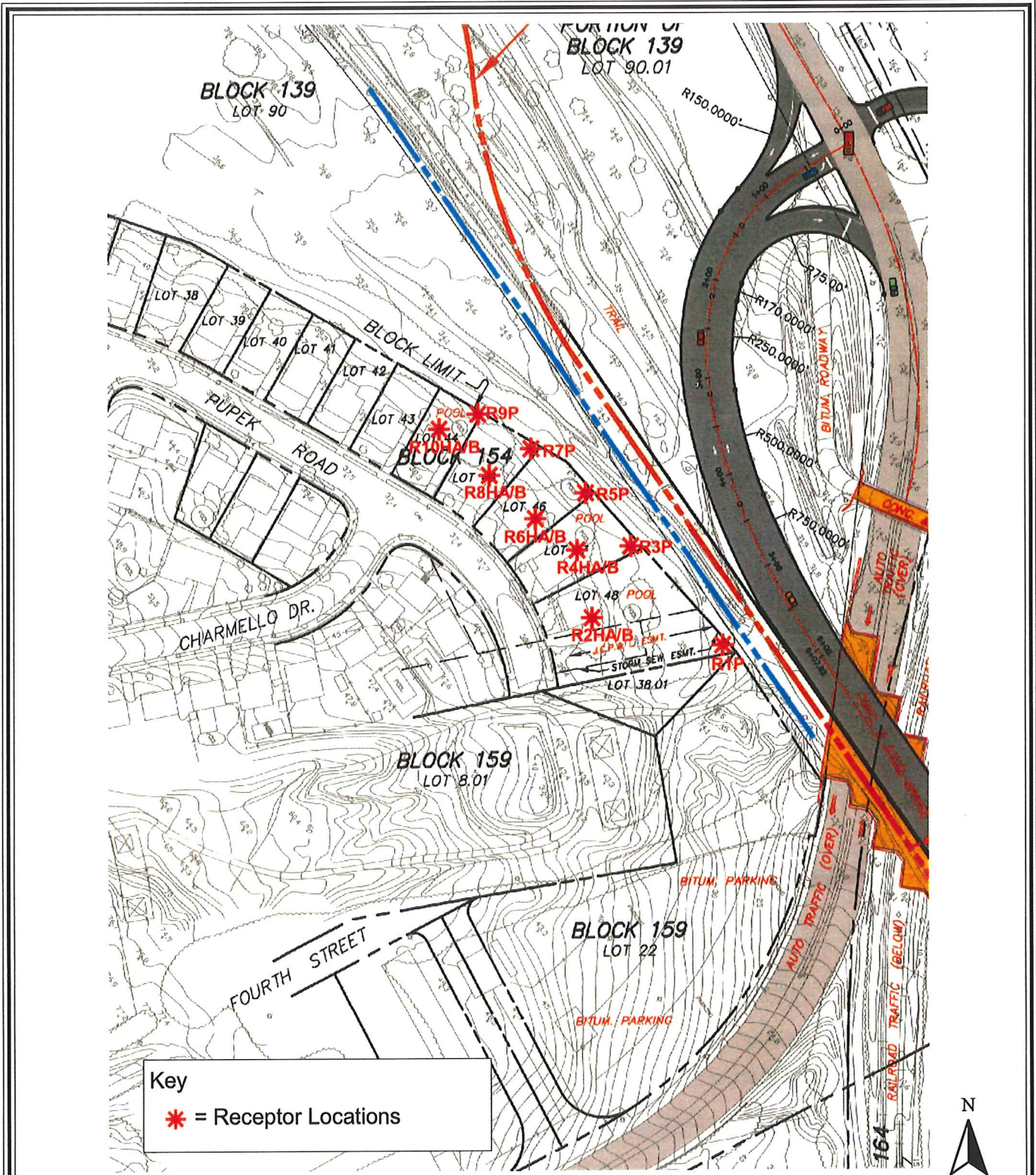
Modeling was performed for the No Build and Proposed Action scenario years of ETC (2003), ETC+10 (2013), and ETC+20 (2023) for both the AM and PM peak hour time periods. The ETC+20 was also the Design Year. Noise contributions from Main Street and the McCormack facility were also included in this study.

A detailed description of the noise modeling program is presented in the Noise Technical Environmental Study (Volume II).

### **Noise Modeling Results**

The peak hour predicted noise levels ( $L_{eq}(h)$ , in dBA) for the selected roadway links and receptors are presented below in Tables 4.6, 4.7 and 4.8.





Key  
 \* = Receptor Locations

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DATE: June 2001	DRAWN BY: MDS	REVIEWED BY: MJM	SCALE: 1"=140'	PROJECT # 39.0413	SHEET # 1 OF 1
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 Suite 3E, POB 1206  
 New York, NY 10011

SOURCE:

Noise Modeling Locations  
 South Amboy Ferry Terminal Project  
 South Amboy, New Jersey

PHE

FIGURE #

4-9

**Table 4.6: Noise Modeling Results (Peak Hour Leq(h) in dBA)  
South Amboy Ferry Terminal EA  
ETC Year 2003**

Receptor ID	Receptor Description	No Build 2003 AM	Prop Action 2003 AM	No Build 2003 PM	Prop Action 2003 PM
R1P	Block 154, Lot 48 Property line	63.8	63.5	59.6	61.3
R2HA	Block 154, Lot 48 Residence, 1 <sup>st</sup> floor	61.8	61.7	57.8	59.4
R2HB	Block 154, Lot 48 Residence, 2 <sup>nd</sup> floor	62.4	62.3	58.3	59.8
R3P	Block 154, Lot 47 Property line	63.2	62.8	58.7	60.6
R4HA	Block 154, Lot 47 Residence, 1 <sup>st</sup> floor	61.7	61.4	57.5	59.2
R4HB	Block 154, Lot 47 Residence, 2 <sup>nd</sup> floor	62.1	61.9	57.9	59.5
R5P	Block 154, Lot 46 Property line	62.4	61.9	57.9	59.7
R6HA	Block 154, Lot 26 Residence, 1 <sup>st</sup> floor	61.0	60.7	56.9	58.5
R6HB	Block 154, Lot 26 Residence, 2 <sup>nd</sup> floor	61.3	61.1	57.2	58.8
R7P	Block 154, Lot 45 Property line	61.2	60.8	57.0	58.7
R8HA	Block 154, Lot 45 Residence, 1 <sup>st</sup> floor	60.3	60.1	56.3	57.9
R8HB	Block 154, Lot 45 Residence, 2 <sup>nd</sup> floor	60.5	60.3	56.6	58.1
R9P	Block 154, Lot 44 Property line	60.3	60.0	56.3	57.8
R10HA	Block 154, Lot 44 Residence, 1 <sup>st</sup> floor	59.7	59.5	55.8	57.3
R10HB	Block 154, Lot 44 Residence, 2 <sup>nd</sup> floor	59.9	59.7	56.0	57.4

Source: PHE, Inc. 2002

**Table 4.7: Noise Modeling Results (Peak Hour Leq(h) in dBA)  
South Amboy Ferry Terminal EA  
ETC+10 Year 2013**

Receptor ID	Receptor Description	No Build 2013 AM	Prop Action 2013 AM	No Build 2013 PM	Prop Action 2013 PM
R1P	Block 154, Lot 48 Property line	63.8	63.9	59.7	61.9
R2HA	Block 154, Lot 48 Residence, 1 <sup>st</sup> floor	61.8	62.0	57.9	60.0
R2HB	Block 154, Lot 48 Residence, 2 <sup>nd</sup> floor	62.4	62.6	58.4	60.4
R3P	Block 154, Lot 47 Property line	63.2	63.1	58.8	61.2
R4HA	Block 154, Lot 47 Residence, 1 <sup>st</sup> floor	61.7	61.7	57.6	59.8
R4HB	Block 154, Lot 47 Residence, 2 <sup>nd</sup> floor	62.1	62.2	58.0	60.1
R5P	Block 154, Lot 46 Property line	62.4	62.2	58.0	60.4
R6HA	Block 154, Lot 26 Residence, 1 <sup>st</sup> floor	61.0	61.1	57.0	59.1
R6HB	Block 154, Lot 26 Residence, 2 <sup>nd</sup> floor	61.3	61.4	57.3	59.4
R7P	Block 154, Lot 45 Property line	61.2	61.1	57.1	59.3
R8HA	Block 154, Lot 45 Residence, 1 <sup>st</sup> floor	60.4	60.4	56.5	58.5
R8HB	Block 154, Lot 45 Residence, 2 <sup>nd</sup> floor	60.5	60.6	56.7	58.6
R9P	Block 154, Lot 44 Property line	60.3	60.3	56.4	58.4
R10HA	Block 154, Lot 44 Residence, 1 <sup>st</sup> floor	59.7	59.8	56.0	57.9
R10HB	Block 154, Lot 44 Residence, 2 <sup>nd</sup> floor	59.9	60.0	56.1	58.0

Source: PHE, Inc. 2002

**Table 4.8: Noise Modeling Results (Peak Hour Leq(h) in dBA)  
South Amboy Ferry Terminal EA  
ETC+20 Year 2023 (Design Year)**

Receptor ID	Receptor Description	No Action 2023 AM	Prop Build 2023 AM	No Action 2023 PM	Prop Build 2023 PM
R1P	Block 154, Lot 48 Property line	63.8	64.3	59.8	62.5
R2HA	Block 154, Lot 48 Residence, 1 <sup>st</sup> floor	61.9	62.4	58.0	60.6
R2HB	Block 154, Lot 48 Residence, 2 <sup>nd</sup> floor	62.4	63.0	58.5	61.0
R3P	Block 154, Lot 47 Property line	63.2	63.5	58.9	61.8
R4HA	Block 154, Lot 47 Residence, 1 <sup>st</sup> floor	61.7	62.1	57.7	60.4
R4HB	Block 154, Lot 47 Residence, 2 <sup>nd</sup> floor	62.1	62.6	58.1	60.7
R5P	Block 154, Lot 46 Property line	62.4	62.6	58.1	61.0
R6HA	Block 154, Lot 26 Residence, 1 <sup>st</sup> floor	61.0	61.4	57.1	59.7
R6HB	Block 154, Lot 26 Residence, 2 <sup>nd</sup> floor	61.3	61.7	57.4	59.9
R7P	Block 154, Lot 45 Property line	61.3	61.5	57.2	59.8
R8HA	Block 154, Lot 45 Residence, 1 <sup>st</sup> floor	60.4	60.8	56.6	59.1
R8HB	Block 154, Lot 45 Residence, 2 <sup>nd</sup> floor	60.6	61.0	56.8	59.2
R9P	Block 154, Lot 44 Property line	60.4	60.7	56.5	59.0
R10HA	Block 154, Lot 44 Residence, 1 <sup>st</sup> floor	59.8	60.2	56.1	58.4
R10HB	Block 154, Lot 44 Residence, 2 <sup>nd</sup> floor	59.9	60.4	56.2	58.6

Source: PHE, Inc. 2002

The highest modeled noise level (Leq(h)) from the proposed project was 64.3 dBA at receptor R1P, the closest residence property line to the new access roadway, for the 2023 Design Year Proposed Action AM scenario. Differences in noise levels between the No Build and Proposed Action scenarios ranged between -0.5 dBA (a decrease) and +2.9 dBA (an increase). The slight decreases in noise levels due to the Proposed Action scenario occurred only in the 2003 AM peak period, and were a function of a change in vehicular mix due to McCormack operation phase-out.

In general, AM peak periods resulted in higher noise levels than PM peak periods due to higher traffic volumes and a greater mix of heavy-duty vehicles. Due to the growth in background traffic volumes, as well as growth in project usage, noise levels increased slightly in future years for all scenarios.

#### **4.5.3 Comparison to Noise Standards**

The most frequently chosen descriptor of roadway noise is the 1-hour equivalent sound level or Leq(h). The Leq(h) is a measure of the total sound energy averaged over the duration of the observation (or modeling) period. The one-hour Leq is used by the Federal Highway Administration (FHWA), the New Jersey Department of Transportation (NJDOT), and the US Department of Housing and Urban Development (US HUD) as a design standard. These standards provide the basis upon which to compare and evaluate predicted noise levels. For highway (roadway) noise, the FHWA promulgates individual States to determine their own noise criteria. In the case of New Jersey, the NJDOT Bureau of Environmental Analysis has chosen an Leq(h) of 66 dBA as a level for noise abatement criteria for residential receptors (property line). Therefore, if a predicted or monitored Leq(h) meets or exceeds 66 dBA during any 1 hour time period, then noise abatement feasibility is required. In addition, predicted traffic noise levels that substantially exceed (10 dBA) existing noise levels are considered criteria for noise abatement. Noise abatement could take on many aspects, such as noise barriers, building design, and/or increases source-receptor distance.

Modeled on-site increases in vehicular noise levels due to proposed project implementation range from -0.5 (a decrease) to +2.9 dBA (Leq(h)) compared to No Build levels. These increments are barely perceptible to the human ear. The highest predicted noise, located at the closest proposed residential receptor (R1P), had an Leq(h) of 64.3 dBA. This is below the NJDOT noise abatement criteria of 66 dBA.

Comparison of the modeled predicted noise levels to the City of South Amboy Noise Code are not possible due to the difference in noise criteria utilized (see Section 4.5.1).

#### **4.5.4 Construction Noise**

There will be temporary increased noise associated with on-site construction activities. These noise impacts will only affect the nearby existing residential community to the south. Although it is difficult to accurately predict construction noise, due to the variability of construction techniques, which typically are not mandated to a contractor, general conclusions about construction noise impacts may be based upon the types of construction work anticipated and

types of equipment used. In addition, construction noise would typically be confined to daylight hours during which general background noise levels are higher and perceived annoyance is less. There should be no significant impacts during the noise sensitive evening or nighttime hours. The City of South Amboy Noise Code prohibits construction activities between 6 PM and 7 AM on weekdays (non emergency), weekends, holidays, or when maximum permissible sound levels exceed 50 dBA (10 PM to 7 AM) or 65 dBA (7 AM to 10 PM).

The equipment operating at a specific location will depend upon which phase of the job is occurring at that time. The activities generally breakdown into the following 6 phases:

- (1) Demolition - The removal of the existing roadways and debris require the use of cranes, pavement breakers, air compressors, dozers and hand tools. Dump trucks and front end loaders will be used to remove the resulting debris.
- (2) Ground clearing - Unwanted vegetation will be removed. Dozers, dump trucks and front end loaders are generally used to accomplish this phase.
- (3) Earthwork - The existing topography is altered so as to fit the desired contours of the new site. Equipment involved in the excavation of soils includes dozers, graders, scrapers, earthmovers, and backhoes.
- (4) Paving - Pavers, concrete trucks, dump trucks, vibrators, and rollers are utilized in this phase.
- (5) Pile Driving – Pile driving will occur in conjunction with construction of the breakwater, ferry pier, and elevated walkway.
- (6) Erection - This phase will include bridge construction. The primary extra piece of equipment involved would be a crane.

As some of the noisier phases of construction approach the existing residential receptors to the south, it may be necessary to employ mitigative measures. These would include the use of quieter construction equipment and staggering schedules.

## **4.6 Natural Resources**

### **4.6.1 Terrestrial Resources**

#### **Existing Conditions**

Field inspections of the project site has identified a number of common species of wildlife observed directly or indirectly, including avian species (finches, song sparrows, pigeons, mockingbird, cardinal, American crow, blue jays, Canada geese, red-winged blackbirds, herring gulls, ring-billed gull, great black –backed gull, double-crested cormorant, great blue Heron,

egret, starling, mourning dove, hermit thrush) and mammals (rabbits, rats, field mice, meadow voles).

A number of plant and plant communities were identified through a series of transects conducted across the project site. The communities included old field in secondary succession, old field in secondary succession with shrub component, early succession woodlot, early succession wooded edge, and tidal salt marsh/rocky intertidal zone.

A summary of the species identified with community annotation is presented in Table 4.9, Species List for Site Vegetation. *Additional information regarding terrestrial resources is presented in the Technical Environmental Study for Natural Resources.*

### **Build Alternative Impacts**

Under the Proposed Action alternative, the construction of the access road (80,782 sf or 1.85-acres), parking area (260,062 sf or 5.97-acres), terminal (4,305 sf or 0.10-acre), and pedestrian walkway (14,308 sf or 0.33-acre) would result in the loss of 8.25-acres of existing vegetated habitat. Further, construction of the dredged material containment area would remove an additional 4.05-acres of vegetated habitat. Most of the habitat affected is old field vegetation. The treed areas that would be affected consist largely of non-native, invasive Tree-of-heaven and Black locust. Small mammals and birds would be displaced during construction.

Following construction, landscaping with native, ecologically valuable trees and shrubs would provide replacement habitat and improved foodstocks. Species that would be included in the plantings are serviceberry (Amelanchier arborea), Northern bayberry (Myrica pennsylvanica), Red cedar (Juniperus virginiana), and Black cherry (Prunus serotina).

#### **4.6.2 Aquatic Resources**

##### **Existing Conditions**

The waterfront elements of the proposed action, including dredging, construction of the breakwater and ferry pier, and installation of bulkheads, will affect the littoral and subtidal zones of the site. In order to characterize the site and identify the aquatic resources of the Raritan Bay, a four-season monitoring program was conducted beginning in the summer 2000 season and continuing through the spring 2001 season.

##### ***Fisheries Resources***

Blueback herring, striped bass, alewife, and American shad are migratory finfish that have been historically documented in the project area.

The project area has been designated as Essential Fish Habitat (EFH) for several species of fish. Based upon a review of the "Guide to Essential Fish Habitat Designations in the Northeastern United States," issued by the National Oceanic and Atmospheric Administration/National

**Table 4.9:  
Species List for Site Vegetation**

**South Amboy, New Jersey**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Community Type*</b>
Alkali Grass	<i>Distichlis spicata</i>	D
Autumn Olive	<i>Eleagnus umbellata</i>	D
Beach Plum	<i>Prunus maritima</i>	B, C, D
Bittersweet	<i>Celastrus</i> spp.	B
Black Locust	<i>Robinia pseudoacacia</i>	B, C, D
Blackberry	<i>Rubus</i> spp.	B
Canada Goldenrod	<i>Soildago Canadensis</i>	B, C
Canada Goldenrod	<i>Solidago Canadensis</i>	A, B, D
Chickweed	<i>Cerastium</i> spp.	A
Common Mullein	<i>Verbascum thapsus</i>	A, B, C, D
Common Ragweed	<i>Ambrosia arte,osoofolia</i>	A, B, C, D
Common Reed	<i>Phragmites</i> spp.	D
Cottonwood	<i>Populus deltoids</i>	A
Dogbane	<i>Apocynum</i> spp.	A
Dwarf Sumac	<i>Rhus copallina</i>	A, B, C, D
Elderberry	<i>Sambucus Canadensis</i>	B
Evening Primrose	<i>Oenothera biennis</i>	A, C
Goldenrod	<i>Solidago</i> spp.	D
Grass	<i>Graminaea</i> spp.	B, C, D
Grass	<i>Gramineae</i>	A
Grass	<i>Panicum</i> spp.	A, B, C, D
Gray Birch	<i>Betula populifolia</i>	B
Groundsel Bush	<i>Baccharis halimifolia</i>	B
Hackberry	<i>Celtis occidentalis</i>	D
Hawthorn	<i>Crataegus</i> spp.	A
Hyssop-leaved Boneset	<i>Eupatorium hyssopifolium</i>	A, B
Indigo Bush	<i>Amorph fruticosa</i>	A
Japanese Honeysuckle	<i>Lonicera japonica</i>	B
Japanese Knotweed	<i>Polygonum cuspidatum</i>	B
Jimsonweed	<i>Datura stramonium</i>	A
Lady's Thumb	<i>Polygonum persicaria</i>	A
Lance-leaved Plantain	<i>Plantago lanceolata</i>	A
Marsh Elder	<i>Iva Frutescens</i>	D
Milkweed	<i>Asclepias</i> spp.	D
Narrow-leaved Goldenrod	<i>Euthamia graminifolia</i>	A, B, C, D
New England Aster	<i>Aster nove-angliae</i>	B
Nightshade	<i>Solanum dulcamara</i>	C
Pathrush	<i>Juncus tenuis</i>	A
Poison Ivy	<i>Toxicodendron radicans</i>	C



**Table 4.9 (Con't.)  
Species List for Site Vegetation**

**South Amboy, New Jersey**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Community Type*</b>
Pokeweed	<i>Phytolaca Americana</i>	A
Princess Tree	<i>Paulownia tomentosa</i>	C
Queen Annes's Lace	<i>Daucus carota</i>	B
Red Maple	<i>Acer rubrum</i>	C
Rough-leaved Goldenrod	<i>Solidago rugosa</i>	A, B, C
Round-headed Bush Clover	<i>Lespedeza capitata</i>	A
Salt Meadow Hay	<i>Spartina patens</i>	D
Seaside Goldenrod	<i>Solidago sempervirens</i>	A, B, C, D
Showy Goldenrod	<i>Solidago speciosa</i>	A, B, D
Small White Aster	<i>Aster vimineus</i>	B
Smooth Cordgrass	<i>Spartina alterniflora</i>	E
Spotted Knapweed	<i>Centaurea maculosa</i>	D
Sweet Everlasting	<i>Gnaphalium obtusifolium</i>	A, B, C
Thistle	<i>Cirsium spp.</i>	A, B
Trailing Wild Bean	<i>Straphostyles helvola</i>	A
Tree of Heaven	<i>Ailanthus altissima</i>	A, B, C, D
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	C, D
Wax Myrtle	<i>Myrica cerifera</i>	A, B
White Mulberry	<i>Morus alba</i>	C
White Snakeroot	<i>Eupatorium rugosum</i>	A, B, C, D

Source: PMK, 2000

**\* COMMUNITY**

<b>TYPE</b>	<b>DESCRIPTION</b>
A	Old Field in Secondary Succession
B	Old Field in Secondary Succession with Shrub Component
C	Early Succession Woodlot
D	Early Succession Wooded Edge
E	Tidal Salt Marsh/Rocky Intertidal Zone

Marine Fisheries Service, the following life stages of the following species are known to occur in the proposed project area.

- Red Hake (larvae, juvenile, adults)
- Winter Flounder (eggs, larvae, juveniles, adults)
- Windowpane Flounder
- Atlantic sea herring (larvae, juveniles, adults)
- Bluefish (juveniles, adults)
- Atlantic butterfish (larvae, juveniles, adults)
- Atlantic mackerel (juveniles, adults)
- Summer flounder (larvae, juveniles, adults)
- Scup (eggs, larvae, juveniles)
- Black sea bass (juveniles, adults)

In order to document current usage of the site-specific habitat, fisheries resources were sampled in replicate using a 16-foot otter trawl at four locations. These locations are shown in Figure 4-10, Aquatic Sampling Locations.

The results of these trawls are presented in Table 4.10, Summary of Fish Species Collected. Of the 17 fish species collected and identified during the sampling events, only two species, Summer flounder and Winter flounder, are targeted to the essential fish habitat list.

### ***Benthic Resources***

A seasonal monitoring program was conducted to determine the characteristics of the benthic community at the site. Benthic resources were sampled in triplicate at six locations. These locations are shown on Figure 4-10, Aquatic Sampling Locations. All benthic organisms were identified to the lowest practical taxon.


The results of these benthic surveys are presented in Table 4.11, Summary of Benthic Organisms Collected. The majority of the species collected were from the Class Polychaeta, and included worms that are generally considered to be pollution-tolerant species.

### **Build Alternative Impacts**

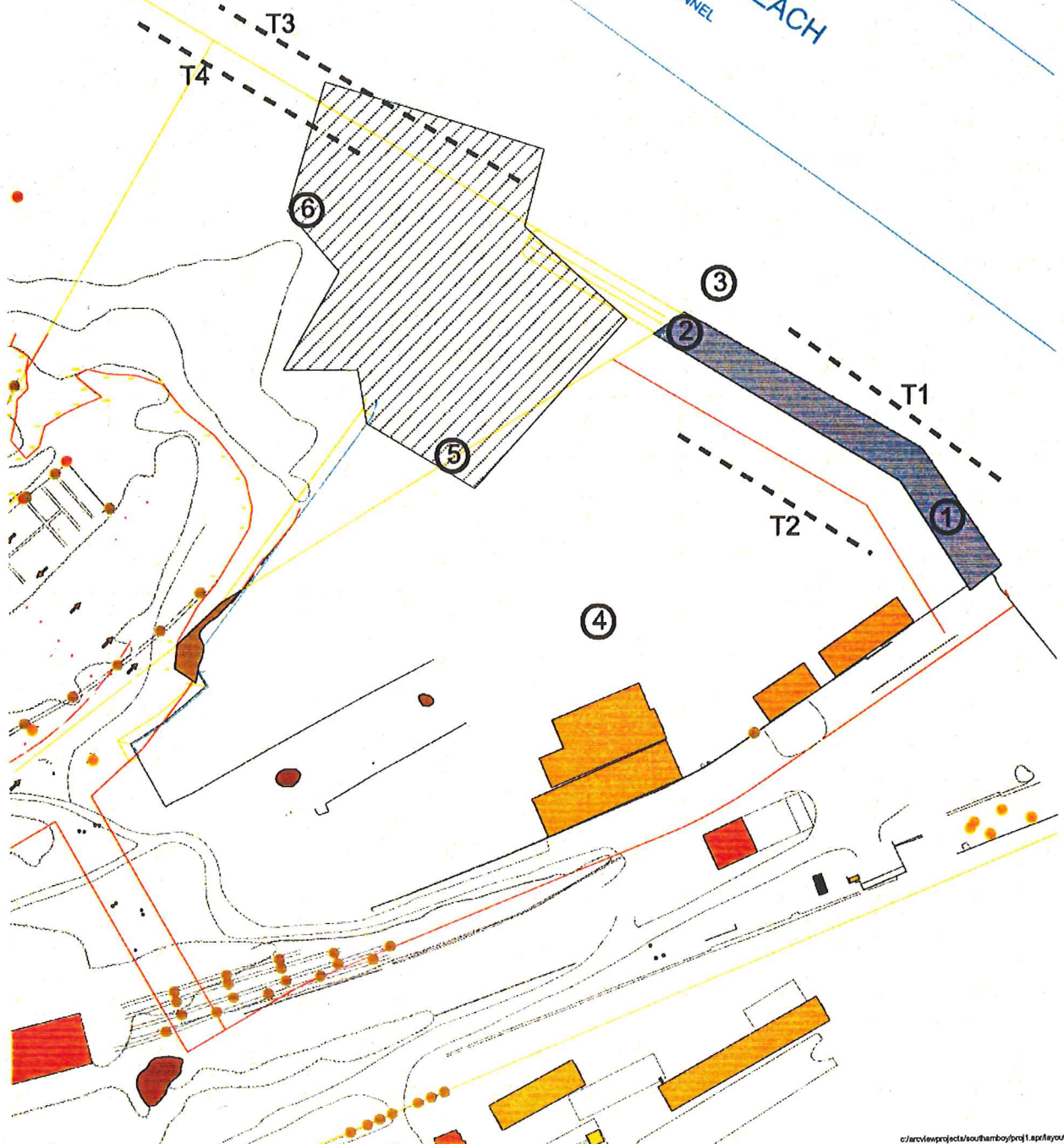
Under the Proposed Action alternative, the activities that would affect the aquatic environment include dredging; and construction of the breakwater, ferry dock, and elevated walkway to the dock.

### **Dredging**

Removal of the upper, unconsolidated sediment by clamshell dredge would result in the temporary loss of all benthic flora and sessile and slow moving infauna and epifauna occupying the areas to be dredged. This would include polychaetes, clams, annelids, snails, barnacles, and others. Larger, more motile epifauna, such as crabs and shrimp, and finfish would be able to escape or avoid the immediate area of dredging activity.

-  Proposed breakwater
-  Proposed dredging
-  = Benthic Sampling Locations
-  = Trawl Locations

SOUTH AMBOY REACH  
FEDERAL CHANNEL



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DATE: June 2001	DRAWN BY: MDS	REVIEWED BY: MJM	SCALE: 1"=130'	PROJECT # 39.0413	SHEET # 1 OF 1
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**Aquatic Sampling Locations**  
**South Amboy Ferry Terminal Project**  
**City of South Amboy, New Jersey**

SOURCE: PHE	FIGURE # 4-10
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**Table 4.10:  
Summary of Fish Species Collected  
Intermodal Ferry Transportation Center  
South Amboy, New Jersey**

<b>Scientific (Common Name)</b>	<b>Summer 2000</b>	<b>Fall 2000</b>	<b>Winter 2001</b>	<b>Spring 2001</b>
American Eel ( <i>Anguilla rostrata</i> )				X
Bay anchovy ( <i>Anchoa mitchilli</i> )	X	X		
Croaker ( <i>Micropogonias undulatus</i> )		X		
Lizard Fish ( <i>Synodus foetans</i> )	X			
Hogchoker ( <i>Trinectes maculatus</i> )				X
Pipefish ( <i>Sygnathus fuscus</i> )	X	X	X	X
Puffer ( <i>Spherooides maculatus</i> )	X			
Sea robin ( <i>Prionotus sp.</i> )	X	X		
Smallmouth Flounder ( <i>Etropus microstomus</i> )	X	X		
Spot ( <i>Leiostomus xanthurus</i> )	X			
Spotted hake ( <i>Urophycis regius</i> )		X		X
Summer flounder ( <i>Pseudopleuronectes americanus</i> )	X			X
Sundial ( <i>Scophthalmus aquosus</i> )		X		
Toadfish ( <i>Opsanus tau</i> )				X
Weakfish ( <i>Cynoscion regalis</i> )	X			X
Windowpane flounder ( <i>Lophopsetta maculata</i> )	X	X		X
Winter flounder ( <i>Paralichthys dentatus</i> )		X		X

Source: PHE, 2001.

**Table 4.11:  
Summary of Benthic Organisms Collected  
Intermodal Ferry Transportation Center  
South Amboy, New Jersey**

Class / Species	Season			
	Summer 2000	Fall 2000	Winter 2001	Spring 2001
Annelida				
Polychaeta				
Streblospio benedicti	X	X	X	X
Eteone sp.	X	X		
Haploscoloplos sp.	X	X	X	X
Capitella capitata	X	X	X	X
Notomastus sp.		X		
Lycastopsis pontica		X		
Pectinaria gouldii			X	X
Dodecaceria corallii		X		
Clymenella torquata		X		X
Lepidonotus squamatus	X			
Cirratulus cirratus			X	X
Nereis viridis			X	X
Autolytus sp.			X	X
Owenia fusiformis			X	
Heteromastus filiformis				X
Polydora ligna				X
Amphitrite sp.				X
Marphysa sanguinea			X	
Oligochaeta				
Mollusca				
Gastropoda				
Crangon septemspinosum		X		
Nassarius spp		X	X	X
Bivalvia				
Mulinia lateralis	X	X	X	X
Mya arenaria			X	
Arthropoda				
Mysis sp.	X	X		X
Gammarus sp.			X	
Amphipoda scud				X
Amphipods	X			
Nemathelminthes	X			X

Source: PHE, 2001.

Dredging of the ferry basin and access would not have long-term effects on the benthos. The area to be dredged is estimated to be 171,000 sf or 3.93-acres, which is a very small portion of similar habitat within the Raritan bay ecosystem. The short-term loss (in terms of the proportion of the available standing crop removed) of these organisms would be insignificant in view of similar distributions and densities of organisms and substrate types throughout the Bay and South Amboy vicinity.

Although measures would be taken to minimize turbidity, tides and currents would increase the turbidity plume zone, as described in Section 4.2.1 Surface Water.

During the period for dredging, the dominant finfish species in the area would include several demersal taxa - Winter flounder, Windowpane, and Summer flounder. Due to the depth of the water, the majority of migratory species would be absent or present at low densities during the cooler months when dredging is proposed.

The conclusion that impacts on finfish and mobile benthos would be of minimal consequence during marina construction is based on the following:

- Dredging would not occur when migratory fish species would be abundant or when larval and juvenile fish densities for most taxa would be high.
- All dredging would take place along an open shoreline where dilution volume, currents, etc., would result in rapid dissipation of the dredge plume.
- Except for a narrow zone immediately around the dredge, suspended solid loads would not reach levels that interfere with normal fish functions. As stated by O'Connor and Sherk (1974) in their extensive studies on suspended solids effects on fishes, "the results presented...show 'effect' levels of suspended particles to be rather much greater than concentrations that could be found in natural circumstances or in the vicinity of dredging activities (see, e.g. Masch and Espey 1967)."
- The low levels of organics and metals in the sediments of the marina would pose no potential toxic threat to fishes in the area in terms of their mobilization during dredging.
- Dredging during cooler months would not result in limiting oxygen concentrations occurring around the dredging zone.
- Fish and mobile epibenthos would be capable of avoiding the dredging operation and plume and by "choice" may feed in the vicinity.
- The fish species most directly exposed to the dredge "plume" would be demersal forms that are tolerant of high suspended solids in the water column because of their bottom dwelling habits.

### **Breakwater**

The proposed breakwater would be a floating structure approximately 816-feet in length and 40-feet in width (32,640 sf or 0.75-acre). The breakwater depth would be 10-feet, consisting of two-feet of freeboard above the water surface and eight-feet of depth below the surface. The breakwater would be held in place with 18 piles, located on 48-foot centers. The breakwater piles would be steel. The wood used in the breakwater construction would be CCA-treated hardwoods. An illustration of the breakwater and breakwater cross-sections is shown in Figure 4-11, Breakwater.

Water depths in the area where the breakwater would be located average approximately 13-feet mean low water (MLW). Average tidal range is 5.3 feet. Thus, at low tide, approximately six-feet of open water would remain between the lowest point of the breakwater and the substrate. At high tide, this distance would increase to approximately 11-feet.

The breakwater is not anticipated to adversely impede circulation or finfish movement. The provision of an opening between the substrate and bottom of the breakwater ranging in depth from approximately six to 11-feet would provide unimpeded circulation beneath the breakwater. This circulation would prevent any potential for water inside the breakwater from becoming stagnant and experiencing depletion of dissolved oxygen (DO) levels.

Similarly, the opening beneath the breakwater would allow finfish and motile epibenthos to move freely between the basin and adjacent water.

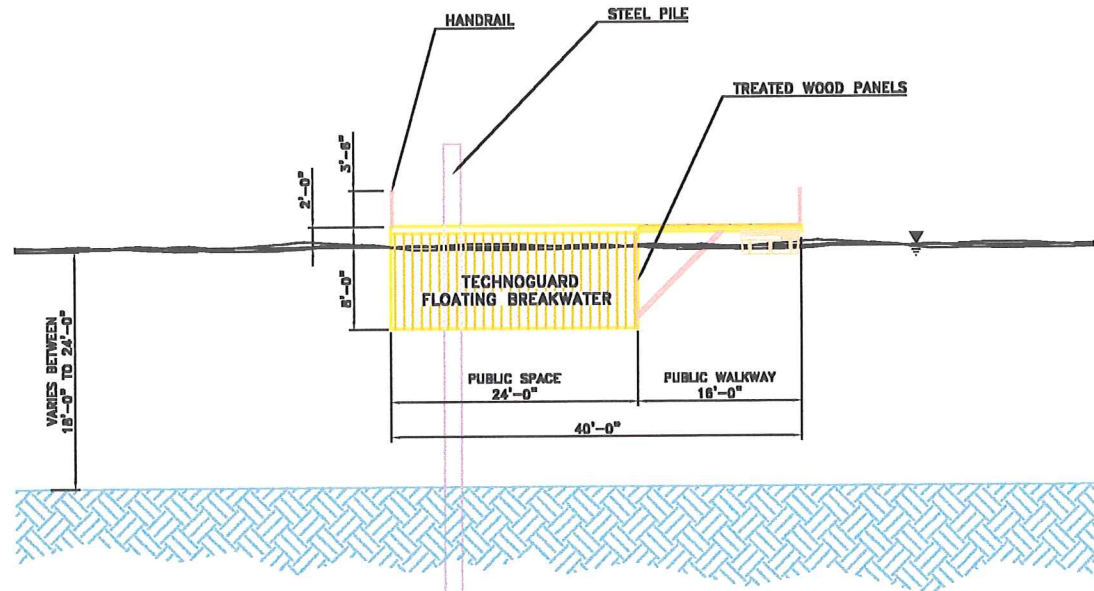
The shading or shadows created by the proposed breakwater would not result in significant adverse impacts to marine ecology. Shadows from the structure would not remain static but would move with the orbit of the earth around the sun. Therefore, even in those instances when there would be a reduction of light, it should only last for a short period. Further, the range of water velocity likely to be encountered at the ferry basin would ensure that phytoplankton entrained in this flow would pass quickly through the shadow.

Further, effective light penetration in Raritan Bay, as measured by a Secchi disk, ranges from four- to seven-feet. Thus, the shadow effect of the breakwater below eight feet would be negligible since light penetration at that depth is minimal.

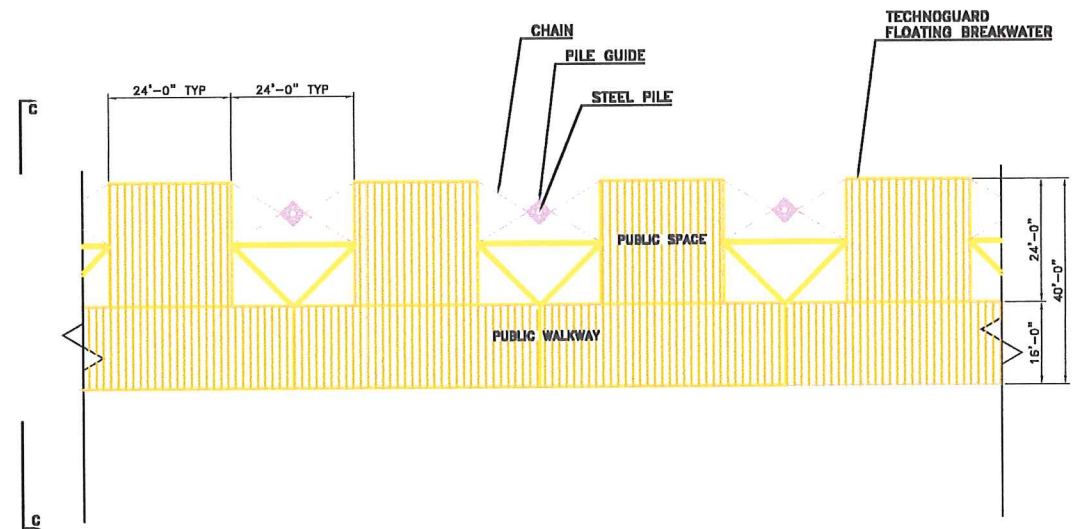
Based on the foregoing it would be indicated that the shading impacts of the breakwater would have little or no impact on the intertidal or marine organisms at the ferry site.

### **Ferry Dock and Walkway**

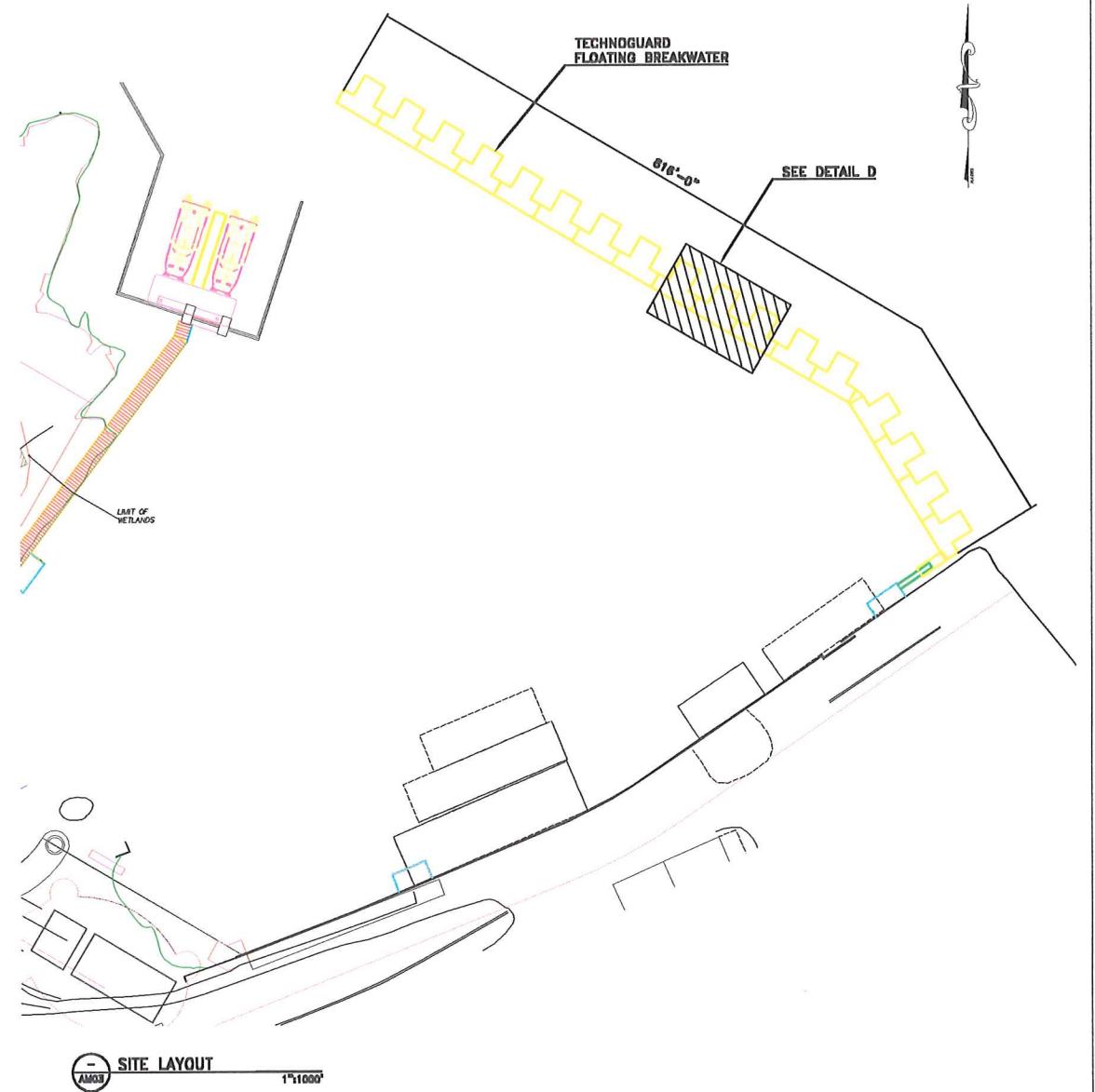
The ferry dock would be a pile-supported structure attached to the mainland by a similarly pile-supported walkway. The walkway would pass across a vegetated saltmarsh (*Spartina alterniflora*) at an elevation of approximately 7-feet mean high water (MHW) and for a distance of approximately 80-feet.




**C-C TYPICAL SECTION**  
 BREAKWATER SIDE VIEW 1"=100'



**D DETAIL D**  
 BREAKWATER PLAN VIEW 1"=200'



**SITE LAYOUT** 1"=1000'

DATE:	DRAWN BY:	REVIEWED BY:	SCALE:	PROJECT #	SHEET #
11/14/01	JFK	MM	AS SHOWN	39.0413	1 OF 1
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DATE:	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
<b>Breakwater</b> <b>South Amboy Ferry Terminal</b> <b>City of South Amboy, New Jersey</b>				
SOURCE:	3146am03r1 Technomarine (8/17/01)	FIGURE #	4-11	



The major potential impact associated with the ferry dock and walkway would be shadowing.

The water depth beneath the ferry dock would be dredged to an approximately 10-foot depth. Thus, for the reasons set forth under the preceding discussion on the breakwater regarding effective light penetration in the bay, the ferry dock would not have an adverse affect on phytoplankton or photosynthesis.

Although the elevated walkway to the ferry dock crosses a saltmarsh, its 14-foot width and the elevation above the vegetation effectively result in no permanent shading. Various studies support the conclusion that a slight to moderate reduction in light does not affect the photosynthetic performance, and, therefore, the growth and productivity of a plant.

Thus, no adverse aquatic impacts are anticipated with the ferry dock and walkway.

#### **4.6.3 Threatened and Endangered Species**

##### **Existing Conditions**

During field inspection, no evidence of critical wildlife habitats was observed above the waterline of the Raritan Bay. The herbaceous tidal wetland area contains many common species of birds, crustaceans, and mollusks but no endangered or threatened species habitat was observed or expected due to the degraded nature of the area.

According to the NJDEP, Natural Heritage Program correspondence for endangered and threatened species, the database “does not have any records for rare plants, animals, or natural communities on the site”. However, the Raritan Bay is known to support endangered and threatened species. The letter from the National Marine Fisheries Service (NMFS) states that loggerhead, green, Kemp’s ridley, and leatherback sea turtles may be present in the project area. The US Fish & Wildlife Service (USF&W) issued a letter of no concern for the project. Please note that copies of referenced correspondence are presented in Appendix B, Correspondence.

##### **Build Alternative Impacts**

The Build alternative would not result in adverse impacts to threatened and endangered species.

#### **4.6.4 Wetlands**

##### **Existing Conditions**

Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated conditions.”

There is a tidal salt marsh located at the northern edge of the property boundary with Raritan Bay. The tidal marsh is approximately 71,000 square feet (1.63 acres) in size and is comprised of several plant communities. The lower portion of the marsh that is directly adjacent to the

Raritan Bay is comprised primarily of Saltwater cordgrass (*Spartina alterniflora*). Seawater spikegrass (*Distichlis spicata*) and Salt-meadow hay (*Spartina patens*) dominate the plant community that is slightly above the cordgrass. The highest region of the marsh that is directly adjacent to the pistol range largely consists of Common reed (*Phragmites australis*). During site investigations, the tidal marsh was observed as filled with various types of debris that had been deposited by the tide.

The wetland habitats are NJDEP mapped coastal wetlands. No other wetland areas were observed at the interior portion of the property or near the waterfront. The remaining waterfront areas that are present on the site are comprised of rocky intertidal zones, wooden docks, concrete piers, and bulkheads.

All wetland delineation was conducted in accordance with the US Army Corps of Engineers Manual using the three-parameter methodology. The tidal wetlands, comprised of cordgrass, spikegrass, and salt hay, are shown in Figure 4-12, Wetlands Map.

### **Build Alternative Impacts**

Under the Build alternative, pedestrian access to the offshore ferry dock from the passenger terminal area would be gained by constructing a walkway that traverses the wetlands at a location that minimizes the disturbance to the saltmarsh habitats. As depicted on Figure 4-13, Wetlands Impact Map, the walkway to the ferry terminal crosses the wetland for a distance of approximately 80-linear feet and is 14-feet wide. The walkway would be elevated approximately 7-feet above the wetlands. The total area of wetlands to be covered by the walkway is approximately 1,120 square feet. The walkway will also cross approximately 135 linear feet of open water (approximately 2,000 square feet).

Due to the elevation of the walkway above the marsh, it would have a minimal shading effect on the wetlands and open water below. No portion of the area beneath the walkway would be permanently shadowed during the day and, therefore, no changes to the plant communities in favor of more shade-tolerant vegetation at this location would be expected. The length of the proposed walkway is limited to only what is necessary for the proposed water-dependent use.

The remaining portions of the proposed walkway should not significantly impact the onsite wetlands. No shading effect is anticipated, except as noted above, since the walkway does not otherwise infringe on the wetland habitat. The construction of a bulkhead is proposed outside the wetlands, and no impacts to the wetlands are expected.

Additionally, the unvegetated intertidal zone will be improved as part of this project. The project proposes to revegetate approximately 4,600 square feet of the intertidal zone with native species, viz., *Spartina alterniflora* and *S. patens*. The placement of vegetation in this area will better secure the area from erosion by decreasing wave energy, create additional habitat for wildlife, and enhance the aesthetic value of the area.

The construction of a wave barrier on the side of the ferry dock facing the wetlands will result in preventing wave energy from potentially eroding any of the existing marsh.



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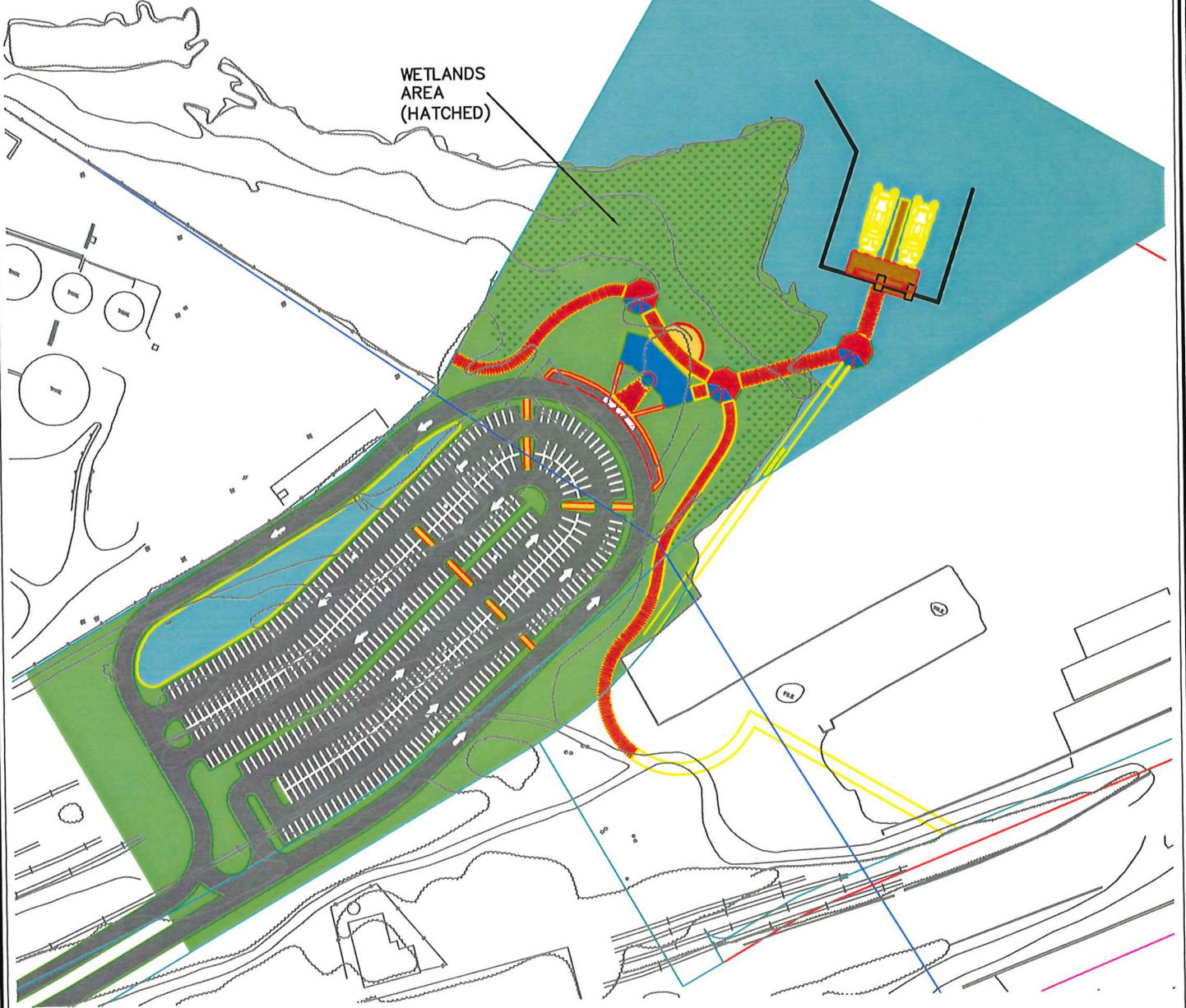
**Wetlands Map**  
**South Amboy Ferry Terminal Project**  
**City of South Amboy, New Jersey**

SOURCE: PHE

FIGURE #  
**4-12**



WETLANDS  
AREA  
(HATCHED)



GRAPHIC SCALE  
(IN FEET)



**Potomac-Hudson Environmental, Inc.**  
Scientists Planners Engineers

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New York, NY 10011

DRAWING:

**Figure 4-13**

**Wetlands Impact Map**  
**South Amboy Ferry Terminal Project**  
**City of South Amboy, New Jersey**

DATE:  
August 2001

DRAWN BY:  
JFK

REVIEWED BY:  
MM

SOURCE:  
CME Associates

SCALE:  
AS SHOWN

PROJECT #:  
39.0413

FILE:  
c:/projects/SAFTP/wetlands4-13.dwg

#### **4.7 Sediments and Dredging**

As part of the development of the ferry terminal, approximately 35,000 cubic yards of sediment will require dredging from the subtidal portion of the site. In order to characterize the sediment, a limited sampling and analysis plan was implemented. The sampling plan was approved by NJDEP, Office of Dredging and Sediment Technology (ODST) on 26 February 2001, and required the collection of nine sediment cores to project depth of 10-feet. Each of the nine sample cores was analyzed for grain size, percent moisture, and total organic carbon (TOC). The location of the sample cores is shown in Figure 4-14, Sediment Sampling Locations. The core samples were then further combined into four composites:

- Composite A (Sample cores 1, 2, and 3)
- Composite B (Sample cores 4, 5, and 6)
- Composite C (Sample cores 7, 8, and 9)
- Composite D (Bottom six inches of sample cores 1-9)

Each of the sediment composites was analyzed for grain size, percent moisture, and TOC; bulk sediment chemistry consisting of semi-volatile organics, pesticides, PCBs, dioxin/furans, and metals; and modified elutriate testing. The results of the analyses are presented in the Sediments and Hazardous Materials Technical Environmental Study (Vol. II).

Preliminary review of these data by NJDEP, ODST has indicated that the dredged material would be suitable for on-site upland disposal. The use of dredged material as fill is an environmentally sound alternative to the importing of other types of upland fill to the site.

Under the proposed action alternative, all dredged material would be placed in an upland location immediately west of the proposed ferry parking area. An approximately four-acre dredged material containment area would be constructed with an enclosure of berms composed of granular material to promote water filtration. A trench would be located around the outer perimeter of the containment area to collect the filtered water. This trench would, in turn, be connected to a grassed swale that would transport the collected effluent to a retention pond prior to release to the bay. As part of the proposed development of the terminal, the site would require fill to raise the grade.

#### **4.8 Hazardous Materials**

##### **4.8.1 Preliminary Phase I Assessment**

A modified Phase I Environmental Site Assessment (ESA) was performed at the Site to determine if there were any potential areas of environmental concern (AOCs) as a result of the historic use, storage, and disposal of hazardous and toxic materials at the Site or adjacent properties. The Phase I ESA included a site reconnaissance, review of the historical usage of the property, review of regulatory records (including a database search, internet search, and file reviews), and conversations with representatives of the current occupants of the property. Based

Field ID	Lat Decimal Min	Long Decimal Min
SA-1	4029.45850	7416.57500
SA-2	4029.44866	7416.54566
SA-3	4029.43383	7416.52933
SA-4	4029.45913	7416.50033
SA-5	4029.47666	7416.53566
SA-6	4029.49383	7416.57150
SA-7	4029.51333	7416.56583
SA-8	4029.50133	7416.52833
SA-9	4029.47833	7416.50800

SOUTH AMBOY REACH  
FEDERAL CHANNEL

EBB  
FLOOD



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DATE: June 2001	DRAWN BY: MDS	REVIEWED BY: MJM	SCALE: 1"=130'	PROJECT # 39.0413	SHEET # 1 OF 1
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**Sediment Sampling Locations**  
**South Amboy Ferry Terminal Project**  
**City of South Amboy, New Jersey**

SOURCE: PHE	FIGURE # 4-14
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on the results of the Phase I ESA and the review of soil and groundwater investigations conducted at the Conrail parcel, supplemental soil and groundwater investigations were performed to characterize current conditions at the various potential AOCs. These investigations did not include any inquiry with respect to radon and methane gas, asbestos, or lead-based paint. A detailed description of the Phase I ESA, Site Investigation, and sample results are presented in the Sediments and Hazardous Materials Technical Environmental Study (Vol. II).

### **Database Search**

The database search performed during the Phase I ESA revealed the following in the vicinity of the Site:

- Two small quantity generators, Modern Transportation Company (hazardous waste transporter with existing violations) and Spectraserv, Inc. (no reported violations);
- A CERCLIS-NFRAP (No Further Remedial Action Planned) listing for Modern Transportation for numerous reports of spills on the docks and into the water. The site is noted as a potential hazard to the bay;
- An NJDEP, Solid Waste Division listing of Spectraserv as a closed solid waste transfer station (facility ID: 1220000537). The authorized waste for the former station was reportedly septic tank cleanout waste and liquid sewage sludge; and
- Three NJRelease/NJSpills cases on or adjacent to the Site with cleanup planned or required. The NJDEP, Division of Site Remediation was contacted for further information on the above referenced cases. The NJDEP representative indicated that there was no information under the referenced case numbers in their computer system, and that the cases may have been referred to local officials.

### **CERCLA Actions (1950 Explosion)**

On May 19, 1950, four lighters and several railroad cars loaded with 420 tons of explosives blew up at the Explosives Pier of the Port of South Amboy. The explosives consisted of anti-personnel and anti-tank mines. A map contained within a report titled "The South Amboy Port Explosion" by the National Board of Fire Underwriters and the Fire Insurance Rating Organization of New Jersey shows that the location of the explosion was approximately where the new ferry dock is proposed.

An existing open Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or superfund) Hazardous Waste Site (NJD986652527), known as the Augusta Street Pier in South Amboy, was discovered during a search of the US Environmental Protection Agency (EPA) website. Upon contacting EPA, the Augusta Street Pier EPA Project Manager indicated that the Pier site is the location of the 1950 explosion and that the case is a result of that explosion. According to EPA, once per year from 1994 through 1997 the EPA, with the Navy's assistance, performed a search for ordinance along the beach and in the waters of the project area. The search area reached about 2.75 total miles from north of the JCP&L facility to south of

the McCormack Sand facility. According to the EPA, approximately 134 grenade-size anti-personnel mines (123 in 1994, 12 in 1995, 2 in 1996, and 6 in 1997) and zero anti-tank mines were recovered during the various searches. Each unit recovered contained only the powder and no detonation capability.

The case is exclusive to material washing up on the shoreline. There is no upland component as a result of the extensive cleanup performed in the years immediately following the explosion. Although the case summary recommends additional searches in February on an annual basis, the EPA indicated that no additional searches are planned or scheduled at this time.

### **Potential AOCs**

The following potential areas of concern (AOCs) were identified during the Phase I ESA:

- Impact from adjacent sites (JCP&L to the north);
- Firing Range (lead, etc.);
- Historic fill;
- Historic discharges due to Site use (rail yard, hazardous waste storage, etc.);
- 4 Former 30,000-gallon ASTs;
- Groundwater; and
- Ordinance in the harbor area.

Soil and groundwater investigations were conducted in these potential AOCs (see Figure 4-15, Areas of Concern).

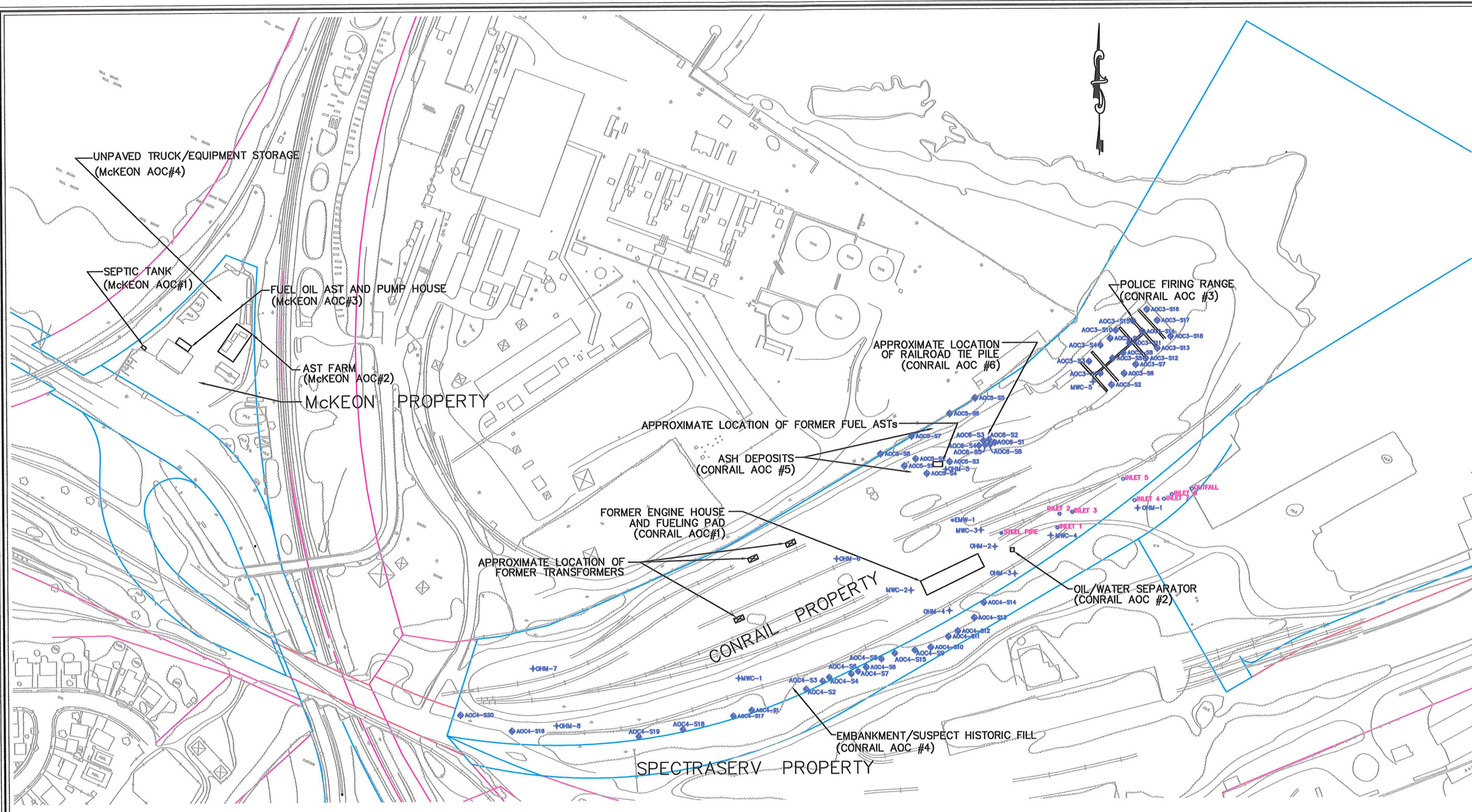
#### **4.8.2 Supplemental Investigations**

##### **Soil**

A total of 71 soil samples were collected from 52 soil borings conducted in the various potential AOCs using a hand auger. The boring and soil sample locations are depicted on Figure 4-15, Areas of Concern. The results of the laboratory analysis of the soil samples that exceeded the applicable NJDEP Soil Cleanup Criteria (SCC) are shown in Table 4-12 below.



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						<b>Areas of Concern</b> South Amboy Ferry Terminal Project City of South Amboy, New Jersey				
						SOURCE:	0501053_site2.dwg PMK (8/14/01)	FIGURE #	<b>4-15</b>	
166 John Street PO Box 7 South Amboy, NJ 08879			23 Chapel Avenue Jersey City, NJ 07305			136 W. 16th Street Suite 3E, POB 1206 New York, NY 10011				

**Table 4.12: Summary of Supplemental Soil Investigation Exceedances**

<b>AOC</b>	<b>Description</b>	<b>Exceedances of SCC</b>
Conrail #3	Firing Range	Antimony, Lead
Conrail #4	Embankment/Suspected Historic Fill	Arsenic, Antimony, Lead Chrysene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Total Petroleum Hydrocarbons (TPH)
Conrail #6	Railroad tie pile	Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene

Source: PMK

### **Groundwater**

Seven of the existing monitoring wells on the site were sampled. The locations of the on site monitoring wells are depicted in Figure 4-15, Areas of Concern. Groundwater samples were collected from seven monitoring wells on site. Four additional wells were not sampled because free product was present in the wells at the time of sampling. The groundwater samples were analyzed for Volatile Organics (VO+10), Base/Neutral extractable organics (BN+15), and Priority Pollutant Metals (PP Metals).

None of the results of the laboratory analyses of groundwater samples exceeded the applicable NJDEP Ground Water Quality Standards (GWQS) for VO+10 or BN+15. The metals results for arsenic, lead, and/or antimony were found to exceed the GWQS in five of the samples.

#### **4.8.3 Remedial Actions**

##### **Remedial Plan for Soils**

Based on the results of the various investigations performed to date, soil contamination exceeding the New Jersey Department of Environmental Protection Soil Cleanup Criteria (NJDEP SCC) was found in the surficial soil in many areas of the Site. The majority of the contamination is metals and PAH compounds with isolated areas of TPH and PCB contaminants. Since the majority of the contamination is surficial and is unlikely to affect groundwater, a remedial approach that will likely be acceptable is the use of institutional and engineering controls (e.g. Deed Notice with capping of the entire site) to address the soil contamination present exceeding the NJDEP SCC. Capping the Site would entail placing two feet of relatively impermeable certified clean soil over the entire site. The areas exhibiting high contamination concentrations should also be covered with asphalt where feasible.

A Deed Notice would be filed with the Middlesex County Hall of Records showing the limits of contamination and contaminant concentrations. After the Deed Notice is filed, the NJDEP will require a biennial (every two years) certification that the engineering and institutional controls are being properly maintained and continue to be protective of public health and safety and of environment. If the cap is disturbed or will be disturbed for any reason after the deed notice is filed, the NJDEP would require the submission of a Remedial Action Workplan and Remedial

Action Report to ensure that contaminated material was properly handled and that appropriate measures were taken to restore the cap to original condition. The RAR would also include the results of any post-excavation soil sampling

### **Remedial Plan for Groundwater**

Based on the ground water investigations conducted to date, metal contamination exceeding the Ground Water Quality Standards (GWQS) is present in the majority of the monitoring wells and light non-aqueous phase liquid (LNAPL) is present in several monitoring wells. The remedial plan to address the ground water contamination consists of a separate course of action for each type of contaminant.

Since metal contamination was found in the upgradient monitoring wells and monitoring wells near the former Engine House, this contamination would be addressed through a Natural Attenuation Program with a Groundwater Classification Exception Area (CEA) for the metal contamination found throughout the Site. The boundaries of the CEA would be the entire Site. The CEA would include a description of the fate of the contaminant plume, proposed expiration date, a map of the proposed area to be included in the CEA, determination of whether a groundwater use area will be effected by the CEA, and notification of the CEA to local, county, and state officials. In addition to preparing a CEA and filing a Deed Notice, ground water would be monitored semi-annually to determine if contaminant concentrations are decreasing or were found to be below the GWQS. As soon as the contaminant concentrations are below the GWQS, the CEA would be removed from the Site.

In order to address the LNAPL present in the ground water, the remedial approach would be to delineate the extent of LNAPL and implement a dual-phase extraction achieved by bioslurping methodology in the area where product is present. Bioslurping is the application of connecting a vacuum blower to a monitoring well to remove vapors and LNAPL. The effects of bioslurping are two-fold. It removes the LNAPL from the ground water in a relatively short time period and causes a concentration gradient between the liquid and vapor phase of volatile organics which in turn causes the increased removal of both dissolved phase and residual product present in the soil pores due to smearing.

### **Remedial Plan for Oil/Water Separator and Associated Drainage System**

During the investigation of the oil/water separator and associated drainage system, it was determined that the former oil/water pit is connected to an inlet that is suspected to discharge in the bay at the bulkhead. It is suspected that the two-foot corrugated steel pipe is connected to the oil/water separator pit. A visible sheen was observed in the oil/water separator pit. In order to ensure the NAPL does not discharge into the bay through the oil/water separator pit, the remedial approach consists of sealing the oil/water separator pit with concrete and the associated piping attached to the oil/water separator with a flowable concrete slurry. In addition, the 2-foot corrugated steel pipe would be used as a collection point in conjunction with the remediation of the LNAPL encountered at the Site.

#### **4.8.4 Build Alternative Impacts**

The Proposed Action alternative is providing the impetus for remediation of this site to move forward in a meaningful and expeditious manner. The identification of the site Areas of Concern (AOCs) superimposed on the Proposed Action alternative is shown in Figure 4-16, Hazardous Material AOCs. The City of South Amboy has entered into a Memorandum of Agreement (MOA) with the New Jersey Department of Environmental Protection (NJDEP) to facilitate the State's review of documents pertaining to the cleanup of the site and its use as a ferry terminal. In this manner, the land will be reclaimed for productive civic development that will include substantial public benefits including: additional tax ratables, alternative transportation alternatives, improved regional access, and public access to the Raritan Bay waterfront.

#### **4.9 Socioeconomic Conditions**

For purposes of the social and economic impacts, two impact areas are defined: the immediate project area as shown in Figure 3-1 and described in Section 3.0 of this Environmental Assessment and the secondary impact area. The secondary impact area comprises the entire city of South Amboy. The City of South Amboy was defined as the secondary impact area because of the relatively small land area of the city (approximately 1.8 square miles), the magnitude of the project and the homogeneity of the population. These are such that social, and to an even greater extent, economic impacts would likely be felt throughout the municipality. The project, as proposed, is entirely within census tract 0075, the largest part being limited to the area east of the New Jersey Transit Tracks, plus a small portion where the access road joins Main Street.

Several methods were used to assess the socioeconomic environment of the area. Secondary data were obtained from the U. S. Census Bureau, the Middlesex County Planning Department and various prior studies of the area. A windshield survey of the project area and adjacent areas and interviews with local and county officials constituted primary data collected for this study.

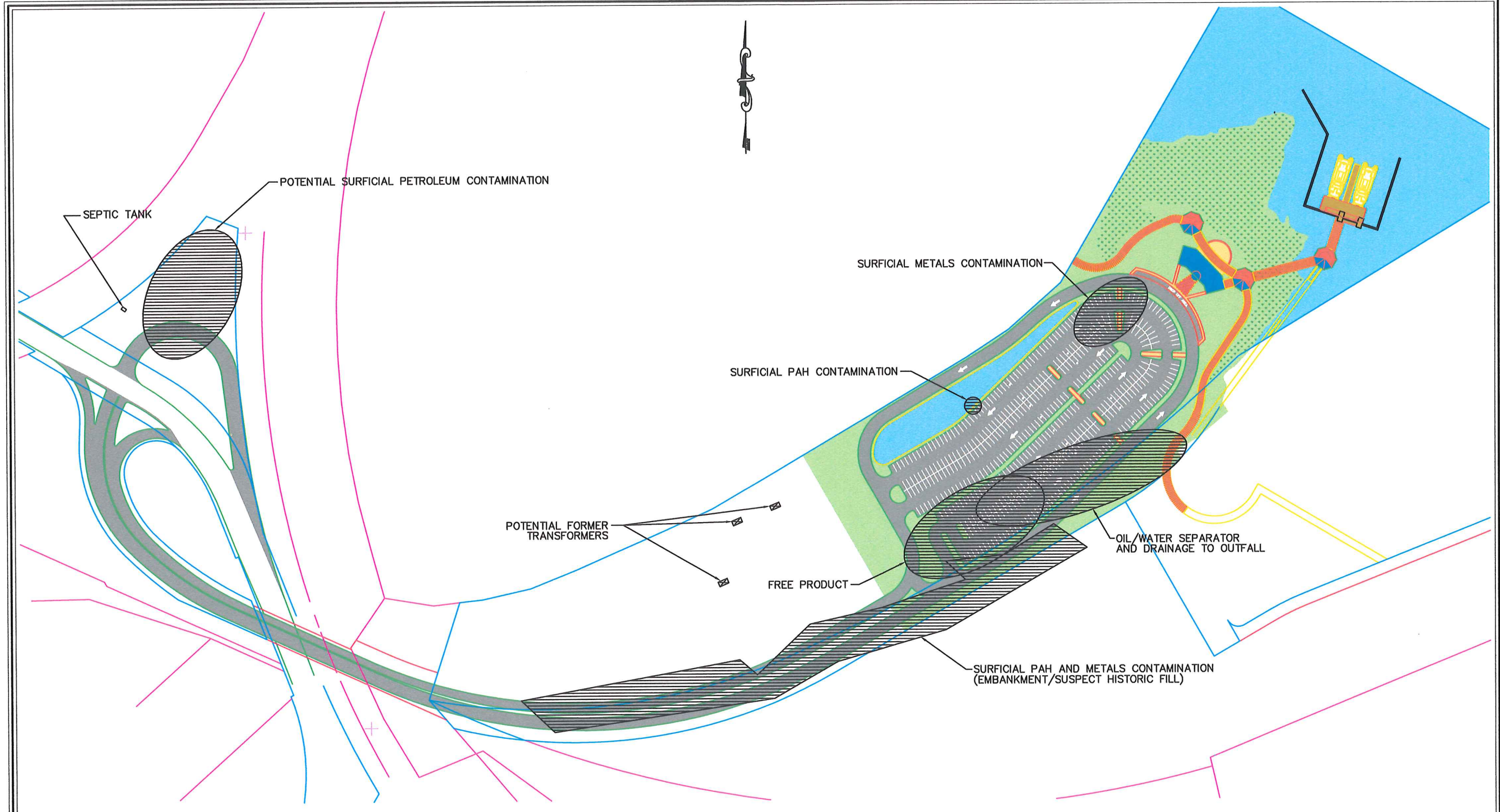
##### **4.9.1 Population**

###### **Existing Conditions**

The population of South Amboy has declined since 1980. The total population for the town was 8,353 in 1980, reduced to 7,863 by the 1990 census, and was estimated to be 7,713 by the U.S. Census Bureau in 1999. The reduction from 1980 to 1990 represented a 5.86% decline, and if estimates are approximately accurate, the decline between 1980 and 1999 represented a 7.7 percent drop. In Census tract 0075, which is the tract that includes the project area, the decline between 1980 and 1990 was approximately 6.45 percent, from 3,518 persons to 3,291 persons.

Part of the decline has been symptomatic of a trend toward smaller households. Although the number of households increased slightly in South Amboy from 1980 to 1990 (2,886 and 2,938, or 1.8 percent) the number of persons in each household declined (from 2.67 to 2.60, or 2.62 percent).

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			166 John Street PO Box 7 South Amboy, NJ 08879		
23 Chapel Avenue Jersey City, NJ 07305			136 W. 16th Street Suite 3E, POB 1206 New York, NY 10011		

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<b>Hazardous Material AOCs</b> South Amboy Ferry Terminal City of South Amboy, New Jersey				
SOURCE:		operations2.dwg PMK (8/27/01)		FIGURE # <b>4-16</b>

The proposed access road, parking and ferry terminal are located in census tract 340230075. As noted above, the Station Planning Area includes most of Tracts 340230075 and 340230076. Detailed descriptions of the subject census tracts are provided in the Technical Environmental Study: Socioeconomics in Vol. II of the EA.

### **Environmental Effects**

Under the No Action Alternative, no immediate impacts would affect the surrounding neighborhoods. Presumably the downward population trend would continue and the economic health of South Amboy would decline or, at best, remain level. Long-term effects on surrounding neighborhoods would likely reflect a gradual decline.

No demographic changes are anticipated as a result of the Proposed Action alternative. For projects characterized by a large influx of employees for a lengthy construction phase, operations phase and ultimate decommissioning, there is often a demographic impact on existing neighborhoods. Although some temporary short-term changes may occur during the construction phase of the project, these are likely to be minor in nature and would last only during a comparatively short construction phase of the project. It is not anticipated that large operating staffs would require residence in South Amboy.

A general improvement in economic health in South Amboy induced by the expenditure of some \$15.5 million construction dollars, some of which would go to local vendors and workers, and by the long-term spending associated with increased commuter traffic should benefit neighborhoods surrounding the project area. No community cohesion impacts are likely, since the project is essentially self-contained, away from residential neighborhoods. No segmenting of communities by physical barriers or separation of neighborhoods from community facilities is anticipated.

#### **4.9.2 Land Use**

##### **Existing Conditions**

South Amboy once stretched from the area that is now Cranbury to Sayreville and had a land area equal to 100 square miles. Its history dates back to the 17<sup>th</sup> century when Dutch settlers arrived to protect New Amsterdam (now Manhattan) from the British. Tracks for the Camden and Amboy Railroad were laid in the 1830's and from these tracks the city gained its form and identity as a regional transfer point between Philadelphia and New York. The Raritan Bay also provided maritime access to the area. Coal and other goods were transferred from trains to barges for distribution all along the east coast. The combination of the Bay and rail, allowed South Amboy to provide coach passenger transfers between New York City and Philadelphia. Through the 19<sup>th</sup> century the City was a significant regional transportation and manufacturing center, producing terra cotta, paint and textiles.

Today, the City encompasses about 1.8 square miles. The majority of its formerly industrial areas are now either vacant or under-utilized (representing over 30% of the City's land mass), its

port is no longer active, and its population is dependent on its neighboring communities for employment, retail and recreational needs<sup>1</sup>.

Land uses in South Amboy include single- and multi-family residences, commercial offices and retail facilities, industrial uses, governmental facilities, transit-related uses, institutional uses and recreational uses. Single family units are concentrated in the area south of Second Street between Broadway and Feltus Avenue; and, between Fourth Street and Raritan Street, west of the railroad tracks and up to Route 35. An older two-story public housing development is located east of Mason Street between Bayshore and Jerome Streets. McCarthy Towers, a federally subsidized mid-rise residential building for the elderly, is located at the intersection of Broadway and Gordon Streets.

South Amboy's central business district, including City Hall and a number of retail, service and restaurant establishments, is located along Broadway between Main Street and Bordentown Avenue. The importance of Broadway as the commercial focus of the City is evident with the recent sidewalk, façade and lighting improvements. Delicatessens/sandwich shops, small grocery stores, and taverns can be found throughout the City.

Institutional uses are concentrated in the southeastern section of the City. The South Amboy High School and Sadie Pope Dowdell Public Library, which opened in September 1996, is located in this area very near the shore of the bay. This large facility and the surrounding grounds represent a significant change in usage and character in this area of the City. Other institutional uses in close proximity to the new school and library building include a sports complex with Little League Baseball fields, the Enterprise Snorkel Rescue Company and the Disabled American Veterans meeting hall. Additional institutional uses are located on Broadway and intersecting streets, between Gordon and Main Streets.

Recreational uses are also concentrated in the southeastern portion of the City, along the Raritan Bay shoreline. They include the Babe Ruth Ballfield, Allie Clark Sports complex and South Amboy Boat Club (a private facility) located at the foot of George Street; and, at the Sayreville borders the entrance to the Raritan Bay Park. Traditionally, the local residents have used this portion of shoreline for fishing and passive recreation.

Industrial uses are located in the northeast section of the City adjacent to the Raritan Bay. They include a New Jersey Power & Light generating station and the McCormack Sand facility. Surface and raised level railroad tracks serving both freight and passenger traffic is a significant feature in this part of the City.

It is in this industrial area that the South Amboy Regional Intermodal Transportation Center is proposed. The access road to the Center would begin just east of the intersection of Main Street and Broadway. This intersection represents the point of bifurcation between the residential and commercial portion of the City and the industrial, waterfront area. There are no residential properties and no pedestrian activity on Main Street, east of Broadway with the exception of two residences on a spur of Main Street. This roadway, which is approximately 300 feet long, is identified herein as a "spur" because it is separated from the actual Main Street roadway by a

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<sup>1</sup> The City of South Amboy, Transit Village Plan. Wallace, Roberts & Todd; October 1999.

guardrail and gradually by elevation. It has no street sign to indicate its name and no outlet. The houses on this spur are approximately 450 feet south of the nearest property to be acquired for the purposes of the proposed action as shown in the survey of Proposed Right-of-Way Acquisitions for the South Amboy Intermodal Transportation Center, prepared by CME Associates, June 12, 2000.

The area east of this intersection is zoned M-1 for light industrial and M-2 for heavy industrial uses. The associated properties have several listed owners including the N/F Consolidated Rail Corporation, which is also known as Conrail, a tax-exempt entity. Development of the proposed action will occur on the following properties according to the survey of Proposed Right-of-Way Acquisitions for the South Amboy Intermodal Transportation Center referenced above (see Table 4.13).

**Table 4.13: Proposed Right-of Way Acquisitions from Survey Prepared by CME Associates (June 2000)**

Parcel	Blk	Lot	Owner / Address	Acreage Proposed for Acquisition	Notes
4	162	1.04	N/F J.T. & R. McKeon 11 Research Ave. Sayreville, NJ	0.568	Entire lot=1.638 ac tax value=104,400 property tax=\$5,397.48
1B	139	90.01	N/F Consolidated Rail Corp. 1700 Market St. Philadelphia, Pa. 19103	1.026	
E1	162	6.01	N/F Consolidated Rail Corp. (as above)	0.260 easement	
E2	162	6.01	N/F Consolidated Rail Corp. (as above)	0.288 easement	
E3	162	6.02	N/F Great Lakes Dredge & Dock Co. PO Box 3220, Main St. S. Amboy, NJ 09979	0.078	Entire lot=5.65 ac. tax value=\$28,300 property tax=\$1,463
2A	161	90	N/F Modern Transportation Co. 75 Jacobus Ave. South Kearney, NJ	2.543	Entire lot=33.26 ac. tax value=\$249,500 property tax=\$13,000
E3	161	90	N/F Modern Transportation Co. (as above)	0.675 easement	
E4	161	90	N/F Modern Transportation Co. (as above)	1.359 easement	
2B	161	90	N/F Modern Transportation Co. (as above)	11.784 riparian 2.236 land	
1A	162	25.01 & 6	N/F Consolidated Rail Corp. (as above)	11.628 riparian 8.973 land	
E1	116	22 & 22.01	N/F Consolidated Rail Corp. (as above) and N/F Richard Catena (no address noted)	0.260 easement	

Source. PHE, 2001



### **Environmental Effects**

No significant changes in land use are anticipated under the No Build alternative. Industrial and commercial uses in the project area would probably remain as they are, at least for the short term. Unused or under utilized industrial properties would likely remain so.

Under the proposed action, Improved utilization of waterfront property should result. Unused or under utilized land would be turned to a productive use that should provide improved economic returns to the community as a whole. The proposed action could also stimulate other associated waterfront development that would be beneficial to the community.

#### **4.9.3 Housing**

##### **Existing Conditions**

South Amboy has a gridiron layout, with compact, walkable streets and sidewalks. Most streets intersect with Broadway, which offers a pedestrian friendly main street. Most of the residential lots are small.

According to the 1990 census there are 3,057 units of housing in South Amboy. Estimates for 1996 indicate that South Amboy's housing stock had increased 3.4% to 3,160 units. There were 1,238 housing units in Census Tract 0075 and 1,808 in Census Tract 0076, according to the 1990 Census. There are no housing units in the proposed development area.

Most of South Amboy's housing was built before 1920 and although the homes range in size and style; many of the homes are moderate to small in size, are 2 to 3 stories and are colonials and Cape Cods. The older and generally larger homes tend to be Victorians; and the more recently built homes are bi-levels with some duplexes. These different style homes are mixed throughout the town with no particular pattern or concentration. Many of the homes have driveways and no garages, and are on small parcels. The homes generally range in condition from fair to good with a number of homes in need of capital improvements and general maintenance. Many of the wood framed homes are covered with aluminum or vinyl siding.

The nearest residential neighborhood to the proposed South Amboy Intermodal Transportation Center would be the area between the Conrail railroad tracks and Fourth Street. This is an area of modest 2-story, homes on small parcels. The overall conditions of the homes vary with most being in good condition. Small front lots, sidewalks and winding blocks, characterize this neighborhood.

An analysis of building permits for privately owned, residential housing from 1995 to 1990 shows a marked difference between South Amboy and its neighbors, Sayreville and Perth Amboy. Sayreville surrounds South Amboy on three sides; Perth Amboy is South Amboy's neighbor to the north across Raritan Bay.

An older two-story public housing development is located east of Mason Street between Bayshore and Jerome streets. McCarthy Towers, a federally subsidized mid-rise residential building for the elderly, is located at the intersection of Broadway and Gordon streets. A (no name) motel that reportedly provides temporary shelter for welfare recipients is located on the north-west corner of South Amboy on Raritan Street near the junction of Route 35.

### **Environmental Effects**

Under the No Action Alternative, it is not anticipated that there will be any change in either housing demand or supply, beyond the existing background growth. Housing development in surrounding communities will continue to outstrip the growth in South Amboy.

The scenario posed by the proposed action would improve the general economic environment in South Amboy and could result in a growth in residential real estate values. This could result in some additional growth in housing development in South Amboy. New private residential building permits have been relatively flat in South Amboy, compared to its neighbors. The proposed action could stimulate some growth in private housing in the city. No adverse effects on housing are anticipated

#### **4.9.4 Community and Public Recreation Facilities**

##### **Existing Conditions**

Community facilities include public buildings, offices and meeting places, schools, hospitals, firehouses and places of worship. In South Amboy there is one police station, five all-volunteer fire stations, one library, one public elementary and intermediate school, and one public junior high school and high school. It has several places of worship and a very active senior citizen center to provide multiple services to a significant portion of South Amboy's population.

Information on the location of community facilities was obtained from field investigations, interviews with local officials and documentary sources. The latter included the Middlesex County Open Space and Recreation Plan (1995) and a Public Parks and recreational facilities inventory, prepared by Wallace, Roberts & Todd (April 1997). A listing of community facilities for the City of South Amboy is provided in the Technical Environmental Study: Socioeconomics in Vol. II of the EA.

Information on the existence and location of public parklands and recreational facilities was collected from field investigations and interviews with local officials and several documentary sources. A copy of the most recent survey of Recreational Facilities for South Amboy was verified as current as of November 2000 with regard to parks and recreational facilities within South Amboy. A listing of these parks and recreational facilities is provided in the Technical Environmental Study: Socioeconomics in Vol. II of the EA.

There are no national or state parks or recreational facilities in South Amboy. Nor are there any County parks or recreational facilities located in South Amboy with the exception of the new

Raritan Bay Park. This 136-acre county park, built at the edge of the Raritan Bay and on the former Old Morgan Landfill, is primarily located in Sayreville at the southern border of South Amboy. The main access road, entrance and a park gazebo are located in South Amboy. The Middlesex County Open Space and Recreation Plan identifies the municipalities of South Amboy and Sayreville as the owners of the parkland. This park is about one and a half miles from the proposed access road to the ferry terminal, or nearest part of the proposed South Amboy Regional Intermodal Transportation Center. John O'Leary Boulevard, which provides waterfront access along the southern end of South Amboy and to the park area, does not provide access to the northern shore of the Raritan Bay.

### **Environmental Effects**

No effect on community facilities is anticipated under this alternative.

Similarly, under the Proposed Action, no adverse effect on community facilities is anticipated. None of the existing Community facilities are located within or adjacent to the properties enveloped in the South Amboy Regional Intermodal Transportation Center. Christ Episcopal Church, which is located on Main Street near the intersection of Broadway, is the closest community facility. The proposed action should not affect any activities at, or access to, any of these community facilities.

None of the existing parks or recreational facilities is located within or adjacent to the proposed South Amboy Regional Intermodal Transportation Center. It does not appear that access to these parks and recreational facilities will be impacted by the proposed action.

## **4.9.5 Fiscal and Economic Resources**

### **Existing Conditions**

The project area includes several ratables that are operating businesses. A considerable area of land is presently owned by Consolidated Rail Corporation (Conrail), whose property is exempt from local real estate taxes. Some property will be acquired outright by South Amboy, and in certain instances permanent easements will be obtained by the city to accommodate the proposed action. Table 4.14 indicates the property owners who will be affected, the planned acquisition, taxes presently paid by property owners and the approximate part of the tax revenue that will be lost to the city through acquisition.

**Table 4.14: Affected Property Owners**

Owner	Size (acres)	Taxes	Planned Acquisition (acres)	Approximate Tax Loss to City
Conrail		N/A	12.654 land 8.97 riparian	None
Modern Transportation Co., Inc.	28.93 land 17.677 riparian	\$13,000	4.779 land 11.784 riparian	None
Great Lakes Dock & Dredge	5.566	\$1,500	0.078	\$21.02
John and Robert McKeon	1.638	\$5,397.48	0.568	\$1,871.65

Source: PHE, 2001

In addition to the above, the city will acquire permanent easements amounting to 2.034 acres from Modern Transportation and 0.288 acres from Conrail.

According to local officials, although only about half of the property in the project area owned by Conrail is needed, the city plans to acquire the other half to be made available to developers for ancillary development. Further, the city will incur no relocation costs, since the businesses located in the project area will continue to operate there under a joint venture agreement between Great Lakes Dock & Dredge and Modern Transportation. This agreement will permit them to share land and waterside facilities, thus reducing the total operating space required. The small excavating company owned by the McKeon brothers is expected to close, but local officials state that the McKeon's had planned to close the business anyway.

### **Environmental Effects**

#### **Fiscal**

No effect is anticipated under the No Action alternative. No change would occur in the taxes received from present industrial and commercial users of the project area. The long-term decline in industrial activity in South Amboy could result in an eventual loss of tax revenue from the existing businesses on the site.

Under the proposed action, there would be some loss of tax revenue in the short term. However, given the city's 2000 tax levy of \$1.005 million, the loss of less than \$7000 annually would be negligible. School District taxes in 2000 amounted to \$3.389 million. Again, the loss would be minimal under the proposed action. Property acquisition costs will be paid in large part by a \$14.2 million federal grant and a \$1 million state grant leaving only approximately \$1.8 million to be raised by the city. There would be no loss of existing jobs as a result of the proposed action and there would be no relocation costs associated with removal of existing businesses. Given the potential for future taxable development, the proportion of the \$15.5 million in construction costs that would be spent in South Amboy, the presumed increase in commuter traffic and spending, and creation of new jobs, the fiscal impacts would appear to be entirely beneficial.

### **Economic**

As with the fiscal impacts, none are anticipated under the No Build alternative, except for a possible long-term loss of industrial businesses, such as Amboy Aggregates, and associated jobs. This possible loss would be part of an historic trend, evident in South Amboy since the 1970s.

Under the Proposed Action alternative, the economic impacts on South Amboy appear to be entirely beneficial. There would be no loss of existing businesses for a period of at least five years. No business relocation costs would be incurred. No existing jobs would be lost for at least a 5-year period. The multiplier effect of construction expenditures, jobs created during both construction and operation of the terminal facility, the probability of additional, related development and the spending generated by an increased commuter throughput should all create a healthy stimulus to South Amboy's economy.

#### **4.9.6 Employment**

According to the 1990 census, total employment in South Amboy in 1990 was 3,969 persons. According to the 1990 census, about 17% of employed persons residing in South Amboy work in South Amboy. Per capita income in the City in 1989 according to the 1990 census was \$15,133. Table 4.15 shows where residents of South Amboy worked according to 1990 census data.

**Table 4.15: Place of Employment Data**

<b>Work Location</b>	<b>South Amboy Residents Employed</b>
South Amboy	670
Outside South Amboy	3299
In Middlesex County (including South Amboy)	2702
Outside New Jersey	283

Source: Bureau of the Census - 1990 Census

South Amboy has historically been a major transportation center, capitalizing on its waterfront and the development of railroads through the city. Coal and manufactured products were among the materials moved through South Amboy. A vigorous industrial base had also developed in the city by the turn of the century with cigar, paint, munitions and textiles forming the industrial base. By the 1970s, industry had dwindled sharply in South Amboy. Its waterside transportation activity was curtailed in the early 1980s, when dredge spoil from the dredging of the Raritan Channel was dumped along the South Amboy coastline, adding 66 acres of land to the city's inventory. Current development efforts in South Amboy are geared to the city's transportation assets. Other strategies focus on "boutique" retail facilities that can compete with large regional malls in nearby areas of Middlesex County.

#### **4.10 Environmental Justice**

The proposed action entails the widening/ improvement of an existing road and the reclamation of predominantly vacant industrial land for use as a ferry terminal and associated parking and support facilities.

##### **Special Populations**

For the purposes of this EA and in accordance with Executive Order Number 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, special populations are defined as significant concentrations of elderly, minority or persons living below the poverty level within the overall population of South Amboy. The presence of special populations in South Amboy was evaluated by reviewing data from the United States Census Bureau.

Examination of the population residing in the project area, the secondary study area and the city of South Amboy indicate that there are no significant concentrations of minority groups that will be affected by the proposed project. Based on the 1990 census, and as presented in Tables 2 through 4 and Figures 2 through 8 in Volume II TES: Socioeconomics, 15.7 percent of the residents of South Amboy were aged 65 or older. Census tract 0075, in which the project is located, had residents aged 65 and older amounting to 14.3 percent of the population, slightly less than the citywide average. The immediately adjacent census tract, 0076, showed a slightly higher proportion of the elderly, 16.8 percent.

Many of the seniors are comprised of life-long residents still living in the homes they share, or had shared at one time, with their families. However, one notable area of concentration for senior residents would be the McCarthy Towers, on Gordon Street and Broadway. The McCarthy Towers is a federally funded senior citizen housing complex with about 75 apartments. The McCarthy Towers is located almost one-mile south of the proposed jughandle. The Shoregate Condominium complex, which is located on the Raritan Bay at the Sayreville border, is an adult community. There are five senior citizens living in the Shoregate Condominiums who are registered at the Senior Citizen Center. Local officials reported that there were approximately 1700 registered senior citizens at the Charles W. Hoffman, M.D. (South Amboy) Senior Citizen Center.

The final special population is persons living below the poverty level. Based on 1989 data included in the 1990 census, the median household income for South Amboy was \$37,933, compared to \$45,623 for the county. Table 4.16 suggests that median Household Incomes in South Amboy, the Station Area and the two affected census tracts are somewhat lower than the Median Household Income in the surrounding county.

**Table 4.16: Income and Poverty Data**

	<b>Median Household Income (1989)</b>	<b>Percent of Total Population Below Poverty Level (1989)</b>	<b>Estimated Median Household Income - 1996 estimated<sup>(1)</sup></b>
<i>South Amboy</i>	\$37,933	7.2	\$44,826
Middlesex County	\$45,623	5.1	\$51,913
Tract 0075	\$39,928	4.2	n/a
Tract 0076	\$36,211	9.4	n/a

Source: U.S. Census Bureau and <sup>(1)</sup> South Amboy Station Area Planning Project (1997) City of South Amboy and NJ Transit (prepared by Wallace, Roberts & Todd and Real Estate Strategies, Inc.

Percentages of persons below the poverty level are slightly higher in South Amboy than in the surrounding county, but the census tract that is the seat of the project has a lower percentage of residents under the poverty level. In any event, the absolute numbers of persons below the poverty level are located in and around the proposed project area is comparatively small.

### **Build Alternative Impacts**

Under the Proposed Action alternative, no environmental justice impacts are anticipated. This is due to special populations not being present in significant numbers in or adjacent to the study area.

## **4.11 Cultural Resources**

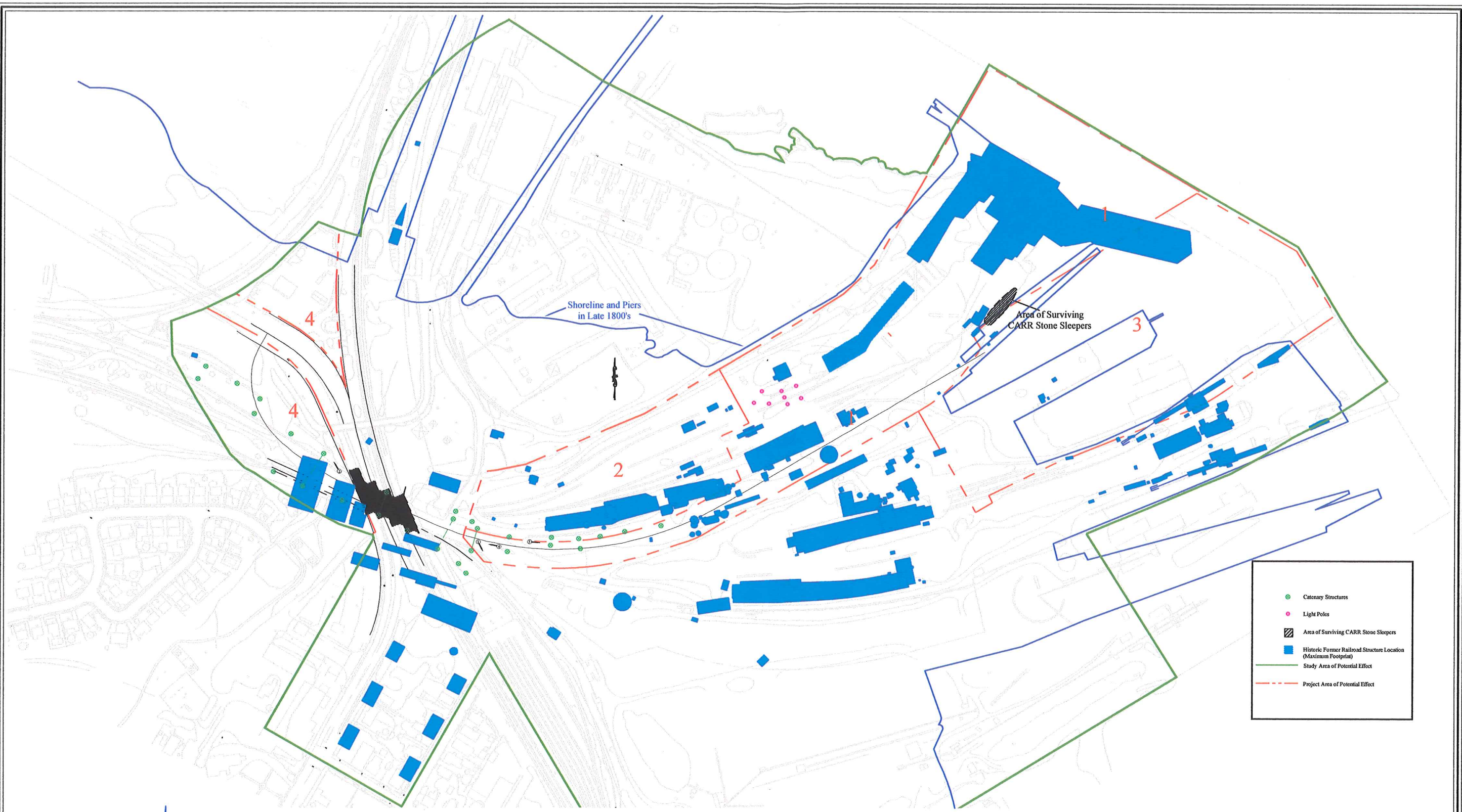
### **4.11.1 Introduction**

The project area falls entirely within the Camden and Amboy Railroad Historic District. In an opinion dated June 26<sup>th</sup> 1975 the New Jersey State Historic Preservation Officer stated that the District is eligible for the National Register of Historic Places, with a period of significance from 1831 to 1965. Archaeological and relict features of this railroad period form the major component of the affected cultural environment. In general, all such features contribute to the overall significance of the District. The treatment that will be applied to such relict features to minimize or avoid any project effects, which are adverse under 36CFR 800.5(1), will vary. Factors such as integrity, age, and function will be applied to assess the relative significance of particular items and hence determine appropriate treatment.

### **4.11.2 Definition of Areas of Potential Effect (APE's)**

Under 36CFR 800.4, the Area of Potential Effect is defined as an initial stage in analysis of the affected environment. The APE boundaries for this project are shown on Figure 4-17, Composite Map of Historic Resources, and reflect the maximum limits of the project as currently projected. The area is broken out into four subsections (1-4). Area 1 is the area of proposed construction of the Ferry Terminals and associated parking and access road, and will be the most

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23 Chapel Avenue Jersey City, NJ 07305			136 W. 16th Street Suite 3E, POB 1206 New York, NY 10011		

DATE	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
<b>COMPOSITE MAP OF HISTORICAL RESOURCES</b> <b>SOUTH AMBOY FERRY TERMINAL</b> <b>CITY OF SOUTH AMBOY, NEW JERSEY</b>				
SOURCE: HUNTER RESEARCH, INC (4/16/03)				FIGURE # <b>4-17</b>



fully addressed in this section. Resources in Areas 2 through 4 will be described and evaluated at a less detailed level.

#### **4.11.3 Site History**

##### **Prehistoric Occupation**

Review of the site files of the New Jersey State Museum and State Historic Preservation Office did not locate information on previously identified prehistoric archaeological resources within the project vicinity. Examination of historic maps shows that the easternmost section of the terrestrial project area sits atop a layer of fill deposited on the river bottom during mid-19th to early-20th centuries. Much of the western portion and some of the eastern portion of the project area appear to have consisted of a low ridge of land extending to the water. In its unaltered form this would have been highly attractive to Native American peoples seeking a location from which to exploit the surrounding riverine/estuarine environment. It is clear, however, that the greater portion of the project area was excavated out to develop the railroad facilities in the 19<sup>th</sup> century, with higher ground surviving only on the northern and southern sides. These areas have in turn been heavily modified by railroad and industrial use and it is considered that there is a very limited potential for intact archaeological resources that would meet the criteria of eligibility for the National Register of Historic Places. Archaeological investigations of the railroad facilities, summarized below, did not locate any prehistoric artifacts or other evidence.

##### **Historic Activity before the Construction of the Camden and Amboy Railroad**

There is no evidence to suggest that the project area was occupied in the historic period prior to construction of the Camden and Amboy Railroad, although adjacent areas were settled in the middle decades of the 17<sup>th</sup> century. There was a small settlement at South Amboy by the time of the Revolution, but this lay along the Bordentown Turnpike (the present Bordentown Avenue) where the ferry to Perth Amboy was located.

##### **Railroad History and Resources**

The Camden and Amboy Railroad was chartered by the New Jersey Legislature in 1830 and its track was opened to South Amboy by September of 1833. It was one of the United States' earliest railroads and served as the principal overland route for travel between the nation's two largest cities, Philadelphia and New York. South Amboy was the railroad's northern terminus and its initial link to the markets of New York City. At South Amboy, the railroad tracks terminated at a ferry wharf and warehouse facility on the banks of the Raritan Bay. Here passengers and cargo were transferred to ships and ferried over the Raritan Bay to New York. This northern terminus of the railroad was located directly within the bounds of the current project area and potentially represents, after the railroad shops at Bordentown, perhaps its most historically significant original component. Nearby, the CAAR also constructed housing for its employees.

In 1831, the Camden & Amboy Railroad was joined with the Delaware and Raritan Canal Company to form "The Joint Companies" which was awarded a monopoly by the New Jersey

legislature on the railroad route between New York and Philadelphia. The importance of the Camden & Amboy's South Amboy facilities was diminished in 1839 when a more direct rail route to New York City was established. This was accomplished by leasing the tracks of the New Jersey Railroad & Transportation Company. These were connected to the Camden & Amboy tracks at New Brunswick and then extended to ferry terminals at Jersey City, bypassing the South Amboy route.

The Joint Companies officially merged with the New Jersey Railroad & Transportation Company in 1867 to form the United Canal and Railroad Companies of New Jersey. This merger essentially provided the Camden & Amboy with complete ownership of the main line from Camden to Jersey City. In 1871, the Camden & Amboy Railroad & Transportation Company was leased by the United Canal and Railroad Companies of New Jersey to the Pennsylvania Railroad Company in perpetuity. The freight handling facilities were converted into coal docks, and more coal was reputedly handled here than any other location apart from Cardiff in South Wales.

Review of historic maps show a continuing build up in the overall size of the railroad facilities at South Amboy from the time of the initial construction through to the end of the first quarter of the 20th century (See Figure 4-17). In the late 1930's part of the facility was electrified by the Pennsylvania Railroad (PRR). Catenary structures surviving from this period were among the last to be erected by the PRR. The wharf facilities at South Amboy began to decline after World War II, an acceleration hastened by the explosion of 19 May 1950, which destroyed buildings and facilities along the Waterfront.

On the basis of this overall history, the resources present on the site can be assigned to three periods:

1. 1831 to 1871: The Camden and Amboy Railroad Period. Although the importance of the line was reduced after 1839, this period of ownership is felt to have its own significance in railroad history.
2. 1871 to 1950: The Coal Docks Period.
3. 1950 to 1965: Decline and reduced levels of use

#### **4.11.4 Identification of Historic Properties**

##### **Previous Survey**

The earlier Camden & Amboy Railroad *Historic Districts Study* defined several elements contributing to the overall significance of the historic district (see Figure 4.17) as follows:

**SACA1 and SACA 23:** the railroad yard areas east of Main Street, which form the bulk of the project area. The railroad embankment, which extends along the northern limit of the project area, appears to follow the approximate original alignment of the C&RR Track of 1834

**SACA 22:** the extensive yard area west of the Main Street Bridge. This is only affected by the western end of the present project (APE Area 4).

**SACA 2:** the 1910-1920 Main Street Bridge, which has been excluded from the environmental review process for this project.

### **Identification for the Environmental Assessment**

Historic properties have been identified using a combination of historical research and archaeological and geophysical survey techniques. The results of the historical research are presented on Figure 4-18, which is based on the extensive data in the early 20<sup>th</sup> century Interstate Commerce Commission records and earlier Camden and Amboy Railroad inventories. It must be stressed that early historic maps do not have the accuracy of modern ones and that the structures shown on the figure are a “best fit”, with the early 20<sup>th</sup> century data being the most accurate and used as a reference for the earlier information. This mapping does however provide a reasonably accurate indication of the location and function of the more than 150 recorded buildings. Although the inventory of structures is unlikely to be fully comprehensive, no important buildings are excluded, and only short-lived and minor buildings may have failed to be identified.

#### **Buildings in 1836:**

At this period, the project area was dominated by an L-shaped ferry terminal complex on the waterfront. A large structure, probably a locomotive house, lay in the north central part of the property in APE 1. A third structure lay in approximately the area of the later car and machine shop complex at the western end of APE 1. Buildings to the southwest of the APE are part of the C&RR company town built in the early 1830’s on either side of Main Street. This complex included a “Rail road house”, probably a hotel, immediately to the southwest of APE 1 and to the east of the present New Jersey Transit line.

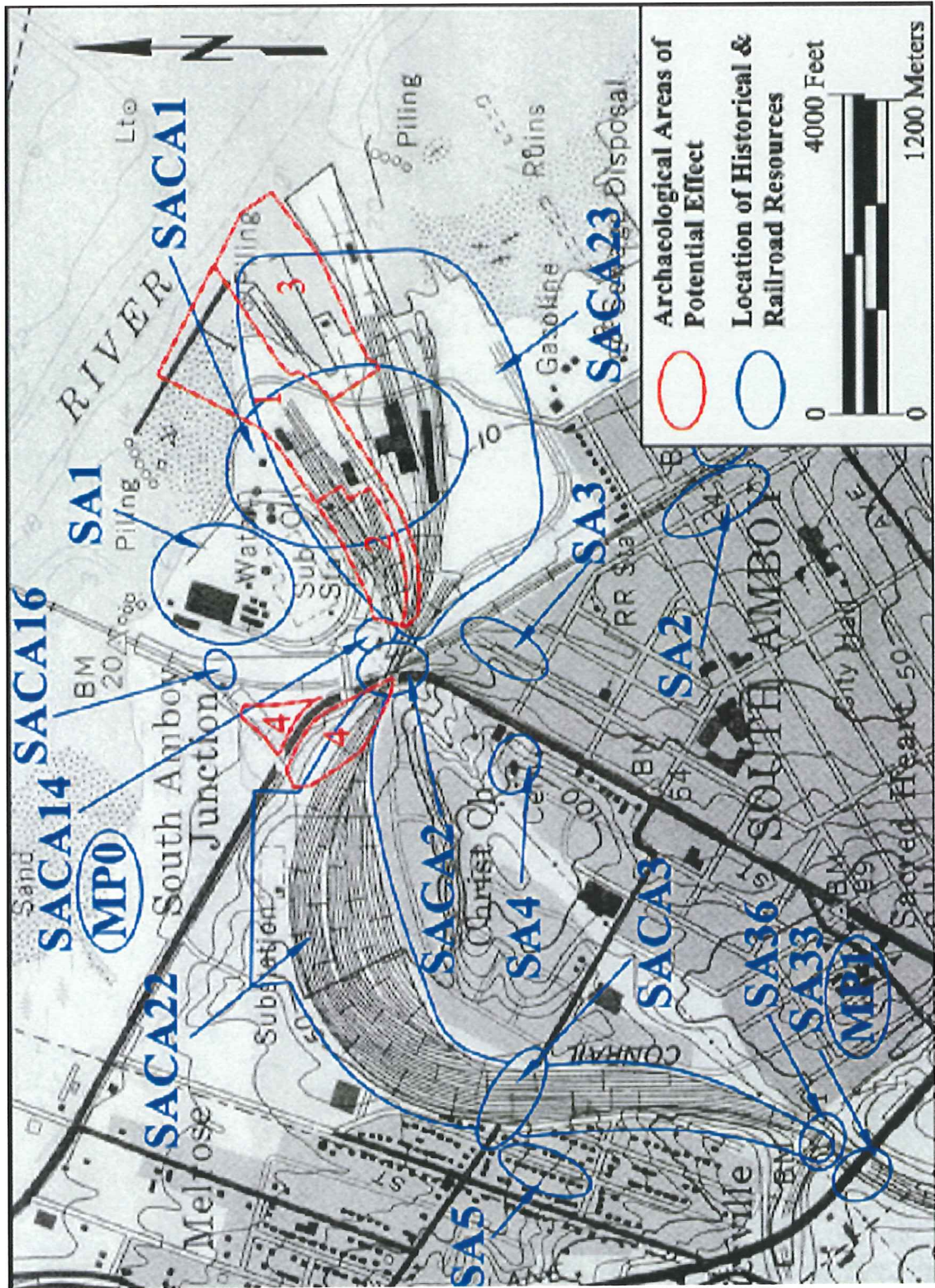
#### **Buildings in 1876:**

By 1876 the original Camden and Amboy ferry terminals had been replaced by larger structures and a wharf in the same general location. A car house lay to the west of the terminals. To the west in APE areas 1 and 2 lay an oil house, engine house (probably on the site of the 1836 structure) and a car and machine shop. The latter building probably also occupied the site of a building shown on the 1836 map. Additional structures lay to the south, beyond the APE.

#### **Buildings in 1919:**

By this period the center of activity at the site had shifted to the south to the coal wharf facilities on the piers to the south (partly within APE 3). Within APE 1 lay three substantial buildings: a locomotive house, a machine shop, and an unidentified building which was probably a car or locomotive maintenance facility judging by its dimensions. These buildings reflect the configuration of 1876 and suggest that the general layout of this part of remained basically the same over a long period, and had essentially been established in the 1830’s. These three buildings were still extant in 1950. The extensive wharfage and terminals present in APE 1 in 1876 were probably abandoned by 1919, as they are not shown on Sanborn maps of that date.

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POTOMAC-HUDSON ENVIRONMENTAL, INC.

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RAILROAD RESOURCES IDENTIFIED IN  
CAMDEN AND AMBOY RAILROAD  
SOUTH AMBOY FERRY TERMINAL PROJECT  
SOUTH AMBOY, NEW JERSEY

SOURCE: Archaeological and Historical  
Consultants, Inc. 2000

FIGURE # **4-18**

Within APE 3 were numerous smaller buildings relating to the coal wharf facilities. To the south of APE 1 was the first of two large coal thawing plants (64), probably built shortly after 1911 and heated by steam produced in a boiler house near the waterfront. The second thawing plant (68) was apparently built during World War II. Coal trains were driven into these immense buildings and steam heat used to thaw frozen loads prior to loading at the wharves. The second plant had an impressive battery of furnaces built on its north side to generate steam for both buildings. The plants were related to the two huge McMyler coal dumpers installed at the coal pier southeast of the site of the proposed ferry terminal in 1911.

### **Buildings after 1919:**

Air photographs from 1940 through 1962 enable later developments to be documented. In the last stage of the electrification program of the PRR in 1938-39, a number of catenary structures were erected to enable electric locomotives to reach the areas near the engine houses, and along a track connecting with the previously-electrified New York and Long Branch Railroad line (now the North Jersey Coast Line operated by New Jersey Transit). In 1940 the site otherwise appears to be much as it was in 1919, although several of the smaller structures had disappeared. By 1947 the western of the three buildings in APE's 1 and 2 (the car house) had been torn down. The 1950 explosives pier also had been built by this date. By 1951 only the machine shop of the 1919 and earlier era buildings was left in APE's 1 and 2, the locomotive shed to the east having been replaced by a new building after its destruction in the 1950 explosion. The remains of the explosives pier had also been removed. By 1962 only the post-1950 replacement of the locomotive shed was left in APE's 1 and 2.

### **4.11.5 Archaeological and Geophysical Investigations**

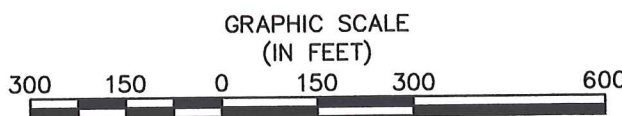
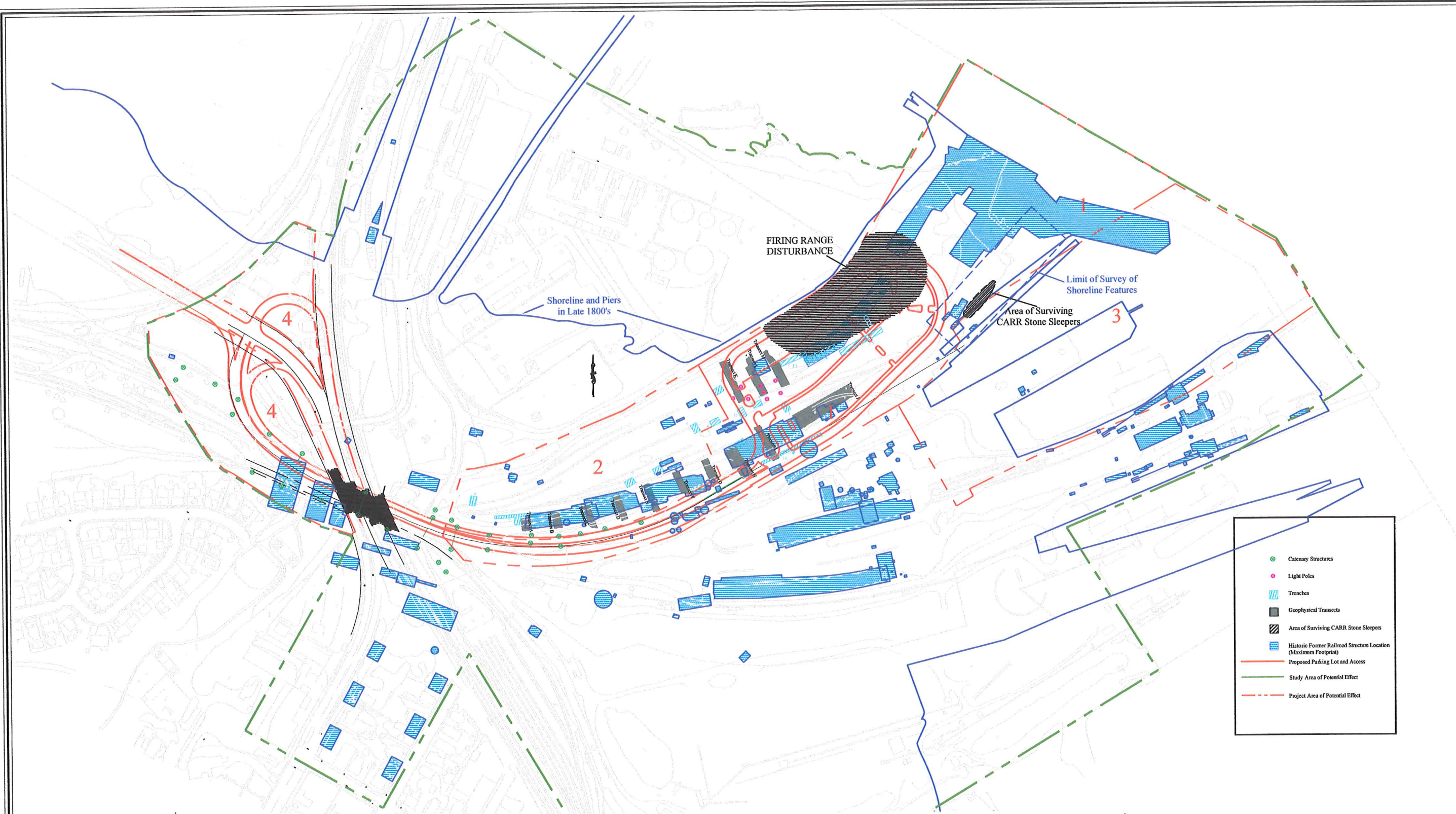
Figure 4-19, Archaeological Testing and Survey, shows the locations and results of archaeological testing and geophysical investigations. The project area of APE's 1 and 2 consists of a low central zone flanked on the north and south by higher ground. On the south side there is a substantial step-sided bluff, the top of which marks the approximate boundary of APE 1. The north side of APE's 1 and 2 is marked by an east west embankment on top of which are the remains of several lines of track. This higher area seems to reflect the initial topography of the area. The eastern part of this zone has been largely removed by construction of the firing range. The central, lower, portion of the site reflects a substantial lowering of the ground, probably before 1876.

Investigations were designed to locate and identify surviving structural remains within the APE's 1 and 2, and evaluate their integrity and significance. Three main tasks were undertaken:

(i) *Mapping of the former wharf area immediately adjacent to the proposed ferry terminal location* in the area of the landward end of the explosives pier, conducted with a total station theodolite and data collector, and preliminary mapping of the extensive areas of offshore pilings.

Detailed survey of the wharf area (location indicated on Figure 4-19) was undertaken to document structural remains on the foreshore. Several distinct features were mapped including a stone retaining wall, stone rail ties (early Camden and Amboy Railroad period), and iron rails,

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ARCHAEOLOGICAL TESTING AND SURVEY  
 SOUTH AMBOY FERRY TERMINAL  
 CITY OF SOUTH AMBOY, NEW JERSEY

SOURCE:  
 HUNTER RESEARCH, INC. (4/16/03)

FIGURE #  
**4-19**

wood pilings, linear timber bulkhead, angled timbers, timber cribbing, a brick footing or edging, and a stone bulkhead wall.

The stone bulkhead or retaining wall is comprised of dry-laid cut stone blocks ranging from one to two feet square. A section of the wall is capped by at least 19 cut granite blocks that appear to be the roadbed used on the earliest track of the Camden and Amboy Railroad in the 1830's. Most of the stone blocks have two holes, each an inch in diameter, a few inches apart, for spikes that held iron rail support plates. These are significant artifacts from the Camden and Amboy Railroad, representing early railroad track technology.

A northeast-southwest timber bulkhead extends along the south shoreline. The square timbers were supported by pilings placed along the waterside of the timbers. Support cribbing consists of round cross-timbers placed in notches cut into the timbers of the timber bulkhead wall base. Additional dock supports are represented by number of angled timber supports, probably used as cross bracing for dock structures. A shorter second stone bulkhead wall was identified at the northeast end of the survey area extending also oriented northeast-southwest.

A large number of wood pilings are present beyond the low tide line. Their general extent is indicated on Figure 4-19. The pilings supported a number of dock configurations, chiefly built before 1876. These were apparently largely abandoned by 1919, and by 1940 had been replaced by the present "T" configuration, and, shortly after that time, the explosives pier was constructed. Accessible pilings along the dock area were mapped with the total station theodolite.

(ii) *Photographic documentation and survey of surviving aboveground elements.* A group of eight light poles was identified in the northwestern portion of APE 1. These were recorded photographically and are among items which may be considered salvageable as part of treatment of historic elements (see below). A separate survey was undertaken of the catenary structures. This survey identified a total of 30 late 1930's catenary support structures within the Area of Potential Effect along the CARR alignment.

(iii) *Archaeological and Geophysical Testing and Survey.* A total of seventeen archaeological trenches were excavated with the aid of a backhoe, and 13 larger transects subjected to geophysical survey. The trenches were placed to intercept the predicted locations of major buildings of the three defined periods in the main areas of anticipated project impact in APE's 1 and 2. The geophysical survey was undertaken to obtain a more general impression of below ground conditions over the undisturbed parts of APE 1 and the southern part of APE 2. The transects were created and the locations were surveyed. The accessible sections of each transect were investigated utilizing ground penetrating radar (GPR) electromagnetic (EM), and magnetic nonintrusive geophysical subsurface delineation techniques in an attempt to delineate buried building foundations and other subsurface targets and anomalies of a historic nature.

The results of the investigations are summarized on Figure 4-19. Full technical documentation of the work is available. Probable or definite building foundations are indicated by a solid black square on the archaeological trenches and on the geophysical survey transects. Archaeological tests that were firmly negative are indicated by an X mark on the trench.

Foundations were encountered at several points along the length of the low central zone in APE 2 and APE 1. These will be summarized from west to east.

Trench 7 and Transect C both encountered evidence of a building foundation. A brick wall extending to a depth of five feet below ground surface was exposed beneath rail yard gravel in Trench 7, and was also strongly indicated in Transect C. The wall is likely to be part of the large car and machine shop complex forming the western of the structures in this part of the site. There was probably a building at this location in 1836, and the site was continuously used until World War II, after which the buildings were successively demolished. Transect F probably also encountered foundations of the machine shop.

Trenches 1 and 2 (3 by 20 feet) were excavated at the probable location of the multi-phase Locomotive House/ Engine House. Trench 1 was located at the northeast corner of the rectangular concrete slab floor of the building that replaced the Locomotive house after the 1950 explosion. A concrete pad floor was exposed directly beneath with a truncated brick wall three courses thick forming the north wall of an earlier building. Trench 2 to the west contained a concrete pad floor abutting a concrete wall or footing. Positive readings in Transect J may relate to these buildings or to the oil house that lay to the west.

Trench 17 was excavated along the east edge of the existing concrete slab to investigate and confirm the location of the Engine House. The east wall of the Engine House was encountered at the west end of the initial 40-foot long trench. The wall is comprised of a section of brick at least one foot wide. The brick includes Sayre and Fischer products and is probably late 19<sup>th</sup>-early 20<sup>th</sup> century. The total width of the brick foundation wall could not be determined because the brick was partially covered by the concrete slab. A concrete foundation wall 0.50 feet wide had been constructed against the east side of the brick foundation. Both foundation walls extended to a depth of 2.50 feet below present ground surface.

Trench 11 was placed just to the north of this complex of buildings. Two parallel sections of concrete curbing oriented east-west each one foot wide located six feet apart, were exposed beneath fill. A one-foot wide concrete and wood railroad tie shelf was located 0.50 feet below the top of each concrete curb. The alternating one-foot-wide wood and concrete sections appear to have supported iron rails. A demolition deposit consisting of concrete, metal, and silty sand filled the four-foot-wide space between the concrete curb and rail support. This deposit extended down below the concrete curb and rail at least three feet, possibly providing access to the underside of rail cars.

Trench 10 was located in the area of the turntable structure shown on the 1919 map. Excavation revealed fill deposits consisting of silty sand with coal and ash, and a strong petroleum odor [1, 2] Two two-foot wide east-west brick footings extending more than 40 feet were located. These foundations may have supported track leading into the turntable. The turntable had been demolished by 1940.

Transects and trenches placed on the raised area in the northern portion of APE1 at two locations did not encounter any structural remains. It seems probable that the car house shown on the 1876, and probably the 1836 maps, lay just to the east in the area destroyed by the construction



of the firing range. In this elevated part of the project area a more complete stratigraphic profile consisting of remnant A horizon and B horizon soils overlying C horizon soils was encountered, supporting the contention that the original grade survives in this area.

#### **4.11.6 Evaluation of Significance**

It is clear from the historical survey that the project area has been the site of significant railroad activity since the early 1830's until after World War II. This significance chiefly derives firstly from the site's function as the northern terminal of the Camden and Amboy Railroad and its ferry connection to New York City, and secondly from its major coal-handling functions in the late 19<sup>th</sup> and first half of the 20<sup>th</sup> century. It is possible to map with confidence the location of the major structures of this second era, and, with less precision, those of the early Camden and Amboy period.

The physical survival and integrity of structural elements that reflect this significance is, however, substantially compromised. Detailed field investigations have to this point been confined to Areas of Potential Effect 1 and 2, which encompass the early Camden and Amboy Railroad components, and the railroad maintenance facilities of the post-1871 period. The major components of the coal handling facility lie partly in APE 3, and have not been fully evaluated under this assessment, and beyond the boundaries of the project.

It is apparent that in much of the central portion of APE 1, the construction of the firing range, the placement of drains, and the destruction wrought by the 1950 explosion, have all severely or completely destroyed archaeological railroad resources.

To the east of this zone of destruction lie the extensive areas of pilings and a zone of exposed wharfage and onshore structural features. To judge by the Sayre and Fisher bricks used in the some of the walling fragments, some at least of this construction dates to after 1850, and may reflect the configuration of the area in 1876, though probably with much later alteration. The stone railroad ties re-used in this area confirm that this is not an original Camden and Amboy construction. The offshore pilings reflect several periods of activity, but some may date to the Camden and Amboy period of before 1871, since after this time the use of this area of the side declined.

In the western part of APE 1 and APE 2 the remains of a linear arrangement of railroad buildings (locomotive sheds, car houses and machine shops) do survive beneath the ground. Two of these buildings have their origins in the 1830's, and were evidently continuously used and modified until they were torn down after 1940. Remains of the buildings lying to the east were also identified.

The catenary at the intermodal ferry site appears to be typical of the PRR freight line electrical installation of 1937-8, with some later modifications. The system has been abandoned for many years and most of the wires have been removed. There has been loss of integrity but the system is still comprehensible if the basic principles are understood.

**Significance Ranking**

Although, has been emphasized, the whole project area has historic significance, surviving physical resources may not all have the same value as contributing elements to the Historic District. These resources are analyzed on an evaluation grid represented by Table 4.17, below. The primary organizing principle is that of the historic periods into which the site has been divided. Different types of physical evidence are evaluated as having different value, depending on the period. Generally, the earlier the period to which a feature belongs the more likely the feature is to be a contributing element to the C&ARR Historic District.

**Table 4.17: Evaluation Grid for Railroad Resources**

<b>Elements</b>	<b>1831-1871: Camden and Amboy Period</b>	<b>1871 to 1950: The Coal Docks Period</b>	<b>1950 to 1965: Decline and reduced levels of use</b>
Individual components (ties, fixtures)	Contributing	Contributing if substantially intact	Contributing if substantially intact
Foundations alone	Contributing	Non contributing	Non contributing
Foundations with interior features and details	Contributing	Contributing	Non contributing
Architecturally distinctive structures or functions	Contributing	Contributing	(none present)

Source: HRI

On this evaluation grid, any features relating to the Camden and Amboy Period are considered to be contributing, because this period is so significant for railroad history, and little is known about the form, structure and evolution of early railroad infrastructure on the C&ARR. Individual elements such as the stone ties, are of considerable historic value and should be considered for salvage and conservation.

For the subsequent Coal Docks period a higher standard is proposed, in that building foundations without associated interior stratification and features are not regarded as contributing elements. It seems likely, from the assessment already completed, that the majority of the identified structures will fall into this category. Individual elements, such as signaling or other fixtures, will only be considered contributing if they show substantial integrity. No elements of this period have been identified with certainty other than the light poles and the catenary structures. Both these groups of features are held to be contributing.

In the final 1950 to 1965 period, only distinctive and intact railroad features will be judged to be contributing.

This evaluation system enables decisions to be concerning appropriate treatment of archaeological resources which may be adversely affected by the proposed project.

#### **4.11.7 Identification of Impacts**

##### **No Build Impacts**

Under the No Action alternative, there is no immediate direct impact to the cultural resources present at the site. However, without proper recordation and, in some cases, care, many of these resources would be irreparably lost or further damaged.

##### **Build Alternative Impacts**

Under the Proposed Action, the project has the potential to adversely impact significant cultural resources, since construction activities, both upland and offshore, will take place in areas where such resources have been identified. Dredging offshore, and grading and excavation onshore, may affect historic features currently visible or identified, and those suspected to exist on the basis of completed research.

Impacts of the Proposed Action are described below and identified on Figure 4-20, Cultural Resource Impacts.

##### **Upland access roadway between Main Street and the ferry parking area**

As currently configured, construction of this road will affect the series of water towers shown on early 20<sup>th</sup> century maps of the rail yard. These concrete footings probably relate to Structure 44 on the building inventory map. Removal of the Conrail bridge will result in the removal of two catenary structures.

##### **Parking area and ferry terminal**

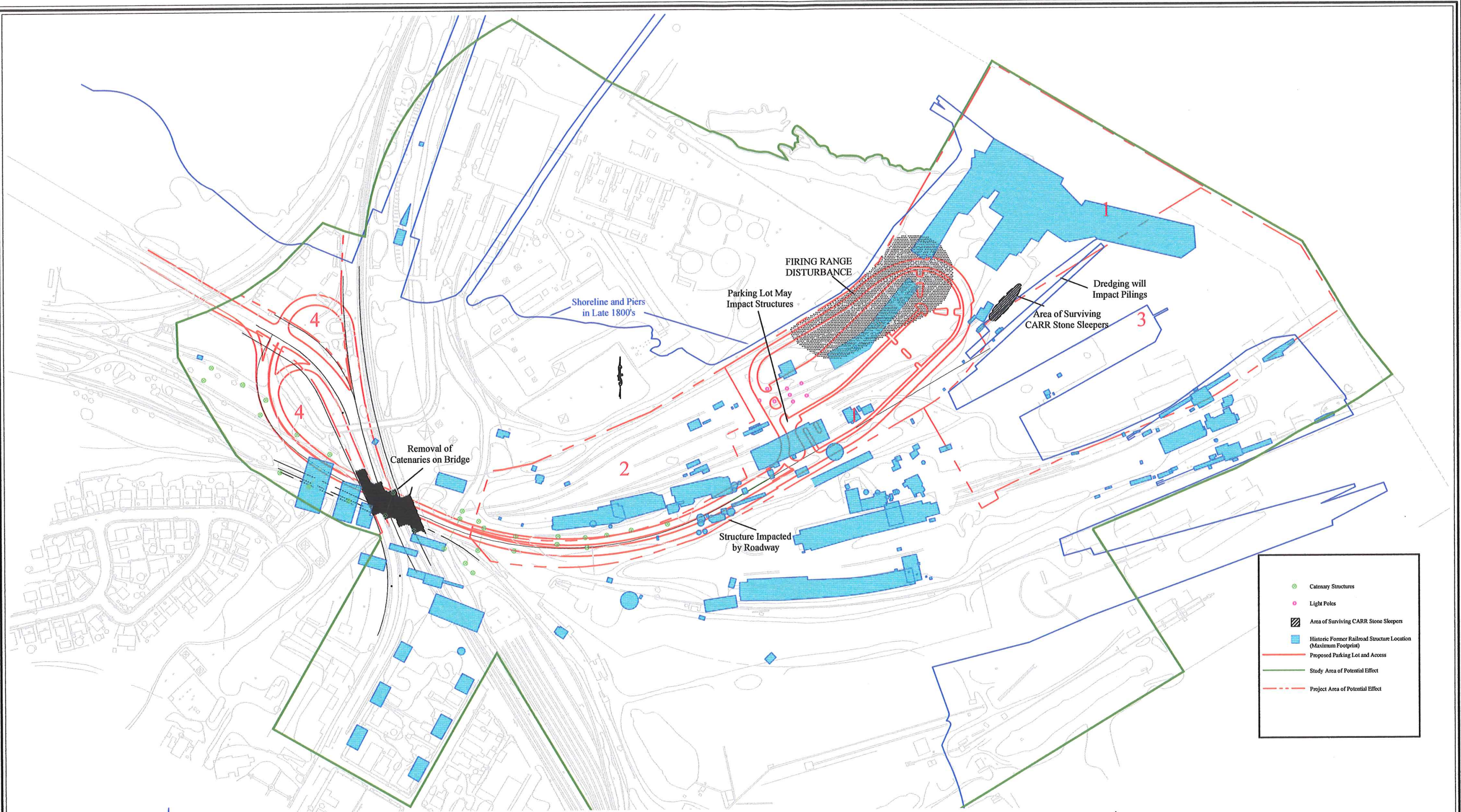
The parking area would be placed in an area of known railroad features dating from the Camden and Amboy period and later. These all lie in the western portion of the area. One of the features from the 1830's, perhaps a locomotive house, is believed to lie in this area, although it has probably been severely compromised by the construction of the building erected after the 1950 explosion. The site of a car house of the 1870's period has been destroyed by the construction of the firing range. Although the parking area will be built at or above present grade there will inevitably be ground disturbance from clearance, site preparation and drainage.

The Ferry Terminal and associated walkways and piers will lie in an area just to the southwest of the mapped location of the 19<sup>th</sup> century ferry terminals, which lay in the current wetland area and out into current tidal waters. Survey of exposed shoreline features on the southeast side of this area has shown that 19<sup>th</sup> century features, including stone railroad ties, remain here.

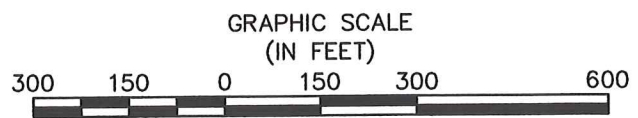
##### **Dredging of the ferry basin, slips, and access channel, and construction of a breakwater and associated slips for the ferry and support vessels.**

These actions will chiefly affect a portion of the complex, multi-period piling settings in the tidal water.

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	Catenary Structures
	Light Poles
	Area of Surviving CARR Stone Sleepers
	Historic Former Railroad Structure Location (Maximum Footprint)
	Proposed Parking Lot and Access
	Study Area of Potential Effect
	Project Area of Potential Effect



DATE	DRAWN BY	REVIEWED BY	SCALE	PROJECT #	SHEET #	DATE	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
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<b>POTOMAC-HUDSON ENVIRONMENTAL, INC.</b> 166 John Street PO Box 7 South Amboy, NJ 08879						<b>CULTURAL RESOURCE IMPACTS</b>  <b>SOUTH AMBOY FERRY TERMINAL</b> <b>CITY OF SOUTH AMBOY, NEW JERSEY</b>				
						23 Chapel Avenue Jersey City, NJ 07305			136 W. 16th Street Suite 3E, POB 1206 New York, NY 10011	

#### **4.11.8 Mitigation**

An extensive current information base for the historic properties on the site has been developed. The general disposition, date and function of the railroad features on the property has been established through historical research and mapping. The underground resources have been evaluated through a sampling program, which has determined where resources lie, and provided some indication of their integrity and significance. Overall, the below-ground archaeological resources appear to lack integrity and be non-contributing, but since the project site has such a long and complex history this cannot be assumed to be the case everywhere, and provision must be made to address the unanticipated discovery of potential eligible and contributing resources during the construction. Other treatments are also proposed.

The following treatment measures would be implemented in order to resolve any potential adverse effects under 36CFR 800.6.

*Recovery and re-use of individual components.* The identified light poles and the stone railroad ties already identified would be appropriately flagged, stockpiled, and incorporated into the ferry terminal facility with the advice of the State Historic Preservation Officer. Portions of the catenary system will be preserved, in particular one portal catenary structure that can serve as an entranceway to the terminal and one or two catenary arms.

*Additional research on affected areas of pilings.* The pilings in the area of the proposed terminal would be mapped and inspected in order to evaluate their date and function more precisely. Those considered to be contributing elements, using the criteria set out in Table 4.17, Evaluation Grid, would be documented through photography to approved HABS/HAER or equivalent standards.

*Evaluation and treatment of buried resources.* Construction plans would be subject to archaeological review and one or more of the following options implemented

- (i) *Project design adjustment.* Where prudent and feasible details of the design would be adjusted to avoid adverse effects on known resources
- (ii) *Archaeological evaluation prior to construction.* In some cases it may be desirable to perform additional evaluation of particular locations to establish the presence of contributing elements. If contributing elements are identified appropriate documentation would be completed in advance of construction.
- (iii) *Archaeological monitoring of construction.* The purpose of monitoring is to ensure that contributing archaeological resources are fully documented in a reasonable and prudent manner within the framework of the undertaking. Two categories of monitoring are proposed:

**Observational Monitoring:** the rapid recordation of archaeological discoveries made during contractor's operations through visual observation, photography and written notes, the inspection of back dirt piles, and the mapping of discoveries in plan and profile. This monitoring would entail a short-term cessation of work,

defined as a period of not more than a specified number of hours during observational monitoring.

**Documentary Monitoring:** the detailed archaeological investigation of discoveries while contractor's operations are suspended at a particular location for an agreed period. Contractual provisions will specify stoppages of up to a particular number of days at any particular location.

*Public Involvement.* The project presents an opportunity to interpret the history of this important site to the public, who will be, in effect, re-creating a function that was first established 170 years ago. The creative re-use and perhaps replication of some elements of the site should be an objective of the landscaping and surface treatments. Durable interpretive panels and signage explaining the history, significance and features of the site would also be included in the design. In addition to the completion of a full report on the archaeological and historical investigations, the body of research developed during this project will be made available as copies to local or regional historical and railroad societies. Such bodies may include the South Amboy and Middlesex County Historical Societies, and the Camden and Amboy and Pennsylvania Railroad Historical Societies.

#### **4.12 Cumulative Impacts**

Cumulative impacts refer to the effects of other, possibly unrelated future actions that could occur within the project area during a similar time frame as the Proposed Action and could, therefore, compound or exacerbate any adverse impacts identified.

Other future actions that may occur within the project area include (i) further waterfront development to the north, south, and west of the proposed project site; and (ii) construction of a marina within the basin immediately south of the ferry operation.

Although it is anticipated that further future development along the South Amboy waterfront will occur, no such development has been specifically identified to date and, therefore, no development has been proposed to occur within the time frame for ferry construction and operation as evaluated in this document.

The NJ Transit plans the rehabilitation of the South Amboy rail station located to the south of the ferry center project area. The major elements of this project include construction of parking facilities and elevated platforms at the station. The construction time frame for this project assumes a start date and completion date subsequent to the ferry center completion.

Any future marina development at the ferry site would likely require additional dredging and the construction of ancillary support facilities. These actions would require appropriate permits from the US Army Corps of Engineers and New Jersey Department of Environmental Protection.

It should be noted that any future development that is proposed will be subjected to a rigorous assessment of its potential social, economic, and environmental effect on the City of South

Amboy as well as any effect on previously identified sensitive areas. For example, future development adjacent to the ferry site will be subject to Section 106 of the National Historic Preservation Act since there is the potential for constructive and/or physical impacts to the Register-eligible Camden & Amboy Railroad historic district.

Further, the City of South Amboy anticipates the City, County, and State undertaking a number of future transportation infrastructure improvements that are independent of the ferry project, but that will result in more efficient movement of traffic. These improvements include modification of the existing Victory Circle to provide increased capacity and improved access to the north and south, widening of Main Street to a four-lane roadway, and various synchronization and adjustment of signal timing ratios.

No adverse cumulative impacts have been identified.

## **5.0 SECTION 4(F) EVALUATION**

### **5.1 Introduction**

FHWA Regulations (23 CFR 771), in compliance with Section 4(f) of the 1966 US Department of Transportation Act (49 USC 303 and 23 USC 138), require that a Section 4(f) evaluation be prepared for any federally-funded highway project that uses property from any significant historic site or structure considered eligible for inclusion in the National Register of Historic Places and/or a significant publicly-owned park, recreation area, or wildlife/waterfowl refuge. Such a use is permissible only if there is no other feasible and prudent alternative and if all possible planning to minimize harm is incorporated into the proposed action.

The identification of the project's purpose and need and description of the proposed action is presented in Section 2.0, Purpose and Need, and Section 3.0, Description of the Proposed Action and Alternatives, respectively

It is the purpose of this section to identify and evaluate location and design alternatives that would avoid the Section 4(f) resource.

### **5.2 Description of 4(f) Properties in the Project Vicinity**

#### **5.2.1 Historic Overview**

The Section 4(f) resource that is affected by the proposed action is a portion of the Camden & Amboy Railroad Historic District (C&ARRHD). This linear resource extends from Camden, New Jersey to the proposed project site in South Amboy. It was determined eligible for the National Register in an opinion from the New Jersey State Historic Preservation Officer in 1975. The entire project area lies within the District.

The C&ARR is one of the earliest railroads in the Nation and was the first in New Jersey. The railroad was innovative in its design and use of ties and rails. The project site was built as a ferry terminal for service to New York, the major destination objective for all early railroads in the state. Maintenance facilities were built on the project site and a company town developed along present Main Street in South Amboy (outside the project limits). The Camden and Amboy railroad period ended in 1871 when the line was taken over by the Pennsylvania Railroad Company (PRR). The last decades of the 19<sup>th</sup> century saw great expansion of the facility to the south, with the creation of a large-scale coal shipping operation on new wharfs. The current project area remained in use chiefly as a locomotive and car maintenance area, and the ferry terminal became abandoned. It was partially electrified by the PRR in the late 1930's.

The coal facility remained active until after World War II. In 1950 there was a large explosion on the explosives pier close to the former ferry terminal site. This damaged many buildings, and, although operations continued in the project area, by 1962 all buildings dating to before 1950 had been removed from the area planned for the new ferry terminal, access and parking facilities.



Historical research and archaeological and geophysical investigation have mapped the locations of the former buildings, and identified areas of major subsequent disturbance. Physical remains of railroad buildings remain beneath the ground as archaeological resources of limited integrity, and surface features (including several examples of significant early stone rail ties) remain on the foreshore. Extensive areas of pilings, probably of 19<sup>th</sup> century date for the most part, remain in tidal water in the area of the former Camden and Amboy ferry terminals. These areas are illustrated on Figure 4-19, Archaeological Testing and Survey and further discussed below.

The historic and archaeological survey undertaken for the NEPA and Section 4(f) processes has developed criteria for assessing whether particular archaeological resources are contributing or non-contributing elements to the C&ARRHD.

### **5.2.2 Identification of Historic Properties**

Historical and archaeological research has been undertaken, as described in Section 4.11, Cultural Resources and summarized below, to identify, locate, and establish the integrity and significance of historic elements on the site.

Figure 4-19, Archaeological Testing and Survey, shows the locations and results of archaeological testing and geophysical investigations. The project Areas of Potential Effect (APE's) 1 and 2 consists of a low central zone flanked on the north and south by higher ground. On the south side there is a substantial step-sided bluff, the top of which marks the approximate boundary of APE 1. The north side of APE's 1 and 2 is marked by an east-west embankment on top of which are the remains of several lines of track. This higher area seems to reflect the initial topography of the area. The eastern part of this zone has been largely removed by construction of the firing range. The central, lower, portion of the site reflects a substantial lowering of the ground, probably before 1875.

Investigations were designed to locate and identify surviving structural remains within the APE's 1 and 2, and evaluate their integrity and significance, as described below.

- **Mapping of the former wharf area immediately adjacent to the proposed ferry terminal location in the area of the landward end of the explosives pier**

Detailed survey of the wharf area (location indicated on Figure 4-19) was undertaken to document structural remains on the foreshore. Several distinct features were mapped including a stone retaining wall, stone rail ties (early Camden and Amboy Railroad period), and iron rails, wood pilings, linear timber bulkhead, angled timbers, timber cribbing, a brick footing or edging, and a stone bulkhead wall.

The stone bulkhead or retaining wall is comprised of dry-laid cut stone blocks ranging from one to two feet square. A section of the wall is capped by at least 19 cut granite blocks that appear to be the road bed used on the earliest track of the Camden and Amboy Railroad in the 1830's. Most of the stone blocks have two holes, each an inch in diameter, a few inches apart, for spikes that held iron rail support plates. These are significant artifacts from the Camden and Amboy Railroad, representing early railroad track technology.

A northeast-southwest timber bulkhead extends along the south shoreline. The square timbers were supported by pilings placed along the water side of the timbers. Support cribbing consists of round cross-timbers placed in notches cut into the timbers of the timber bulkhead wall base. Additional dock supports are represented by number of angled timber supports, probably used as cross bracing for dock structures. A shorter second stone bulkhead wall was identified at the northeast end of the survey area and also oriented in a northeast-southwest direction.

A large number of wood pilings are present beyond the low tide line. Their general extent is indicated on Figure 4-19. The pilings supported a number of dock configurations, chiefly built before 1875. These were apparently largely abandoned by 1919, and by 1940 had been replaced by the present "T" configuration, and, shortly after that time, the explosives pier was constructed.

- **Surviving above-ground elements**

A group of eight light poles was identified in the northwestern portion of APE 1. These were recorded photographically and are among items which may be considered salvageable as part of treatment of historic elements. A separate survey was undertaken of the catenary structures. This survey identified a total of 30 late 1930's catenary support structures within the Area of Potential Effect along the CARR alignment.

- **Archaeological and geophysical testing and survey.**

A total of seventeen archaeological trenches were excavated with the aid of a backhoe, and 13 larger transects subjected to geophysical survey. The trenches were placed to intercept the predicted locations of major buildings of the three defined periods in the main areas of anticipated project impact in APE's 1 and 2. The geophysical survey was undertaken to obtain a more general impression of below ground conditions over the apparently undisturbed parts of APE 1 and the southern part of APE 2. The transects were created and the locations were surveyed. The accessible sections of each transect were investigated utilizing ground penetrating radar (GPR) electromagnetic (EM), and magnetic nonintrusive geophysical subsurface delineation techniques in an attempt to delineate buried building foundations and other subsurface targets and anomalies of a historic nature.

The results of the investigations are summarized on Figure 4-19. Probable or definite building foundations are indicated by a solid black square on the archaeological trenches and on the geophysical survey transects. Archaeological tests that were firmly negative are indicated by an X mark on the trench.

Foundations were encountered at several points along the length of the low central zone in APE 2 and APE 1. These have been summarized below from west to east.

Trench 7 and Transect C both encountered evidence of a building foundation. A brick wall extending to a depth of five feet below ground surface was exposed beneath rail yard gravel in Trench 7, and was also strongly indicated in Transect C. The wall is likely to be part of the large car and machine shop complex forming the western of the structures in this part of the site.

There was probably a building at this location in 1836, and the site was continuously used until World War II, after which the buildings were successively demolished. Transect F probably also encountered foundations of the machine shop

Trenches 1 and 2 (3 feet by 20 feet) were excavated at the probable location of the multi-phase Locomotive House/Engine House. Trench 1 was located at the northeast corner of the rectangular concrete slab floor of the building that replaced the Locomotive house after the 1950 explosion. A concrete pad floor was exposed directly beneath with a truncated brick wall three courses thick forming the north wall of an earlier building. Trench 2 to the west contained a concrete pad floor abutting a concrete wall or footing. Positive readings in Transect J may relate to these buildings or to the oil house that lay to the west.

Trench 17 was excavated along the east edge of the existing concrete slab to investigate and confirm the location of the Engine House. The east wall of the Engine House was encountered at the west end of the initial 40-foot long trench. The wall is comprised of a section of brick at least one foot wide. The brick includes Sayre and Fischer products and is probably late 19<sup>th</sup>-early 20<sup>th</sup> century. The total width of the brick foundation wall could not be determined because the brick was partially covered by the concrete slab. A concrete foundation wall 0.50 feet wide had been constructed against the east side of the brick foundation. Both foundation walls extended to a depth of 2.50 feet below present ground surface.

Trench 11 was placed just to the north of this complex of buildings. Two parallel sections of concrete curbing oriented east-west each one foot wide located six feet apart, were exposed beneath fill. A one-foot wide concrete and wood railroad tie shelf was located 0.50 feet below the top of each concrete curb. The alternating one-foot-wide wood and concrete sections appear to have supported iron rails. A demolition deposit consisting of concrete, metal, and silty sand filled the four-foot-wide space between the concrete curb and rail support. This deposit extended down below the concrete curb and rail at least three feet, possibly providing access to the underside of rail cars.

Trench 10 was located in the area of the turntable structure shown on the 1919 map. Excavation revealed fill deposits consisting of silty sand with coal and ash, and a strong petroleum odor. Two two-foot wide east-west brick footings extending more than 40 feet were located. These foundations may have supported track leading into the turntable. The turntable had been demolished by 1940.

Transects and trenches on the raised area in the northern portion of APE1 did not encounter any structural remains. It seems probable that the car house shown on the 1876, and probably the 1836 maps, lay just to the east in the area destroyed by the construction of the firing range. In this elevated part of the project area a more complete stratigraphic profile consisting of remnant A horizon and B horizon soils overlying C horizon soils was encountered, supporting the contention that the original grade survives in this area.

### **5.2.3 Evaluation of Significance**

It is clear from the historical survey that the project area has been the site of significant railroad activity since the early 1830's until after World War II. This significance chiefly derives firstly from the site's function as the northern terminal of the Camden and Amboy Railroad and its ferry connection to New York City, and secondly from its major coal-handling functions in the late 19<sup>th</sup> and first half of the 20<sup>th</sup> century. It is possible to map with confidence the location of the major structures of this second era, and, with less precision, those of the early Camden and Amboy period.

The physical survival and integrity of structural elements that reflect this significance is, however, substantially compromised. Detailed field investigations have to this point been confined to Areas of Potential Effect 1, 2, and 4 which encompass the early Camden and Amboy Railroad components, and the railroad maintenance facilities of the post-1871 period. The major components of the coal handling facility lie partly in APE 3 and beyond the boundaries of the project, and have not been fully evaluated under this assessment.

It is apparent that in much of the central portion of APE 1, the construction of the firing range, the placement of drains, and the destruction wrought by the 1950 explosion, have all severely or completely destroyed archaeological railroad resources.

To the east of this zone of destruction lie the extensive areas of pilings and a zone of exposed wharfage and onshore structural features. To judge by the Sayre and Fisher bricks used in the some of the walling fragments, some of this construction dates to after 1850, and may reflect the configuration of the area in 1876, though probably with much later alteration. The stone railroad ties re-used in this area confirm that this is not an original Camden and Amboy construction. The offshore pilings reflect several periods of activity, but some may date to the Camden and Amboy period of before 1871, since after this time the use of this area of the site declined.

In the western part of APE 1 and APE 2 the remains of a linear arrangement of railroad buildings (locomotive sheds, car houses and machine shops) do survive beneath the ground, although with diminished integrity. Two of these buildings have their origins in the 1830's, and were evidently continuously used and modified until they were torn down after 1940. Remains of the buildings lying to the east were also identified.

Although the whole project area has historic significance, surviving physical resources may not all have the same value as contributing elements to the Historic District. These resources are analyzed on an evaluation grid previously represented in Table 4.17, and reproduced below. The primary organizing principle is that of the historic periods into which the site has been divided. Different types of physical evidence are evaluated as having different value, depending on the period. Generally, the earlier the period to which a feature belongs the more likely the feature is to be a contributing element to the C&ARR Historic District.

### Evaluation Grid for Railroad Resources

Elements	1831-1871: Camden and Amboy Period	1871 to 1950: The Coal Docks Period	1950 to 1965: Decline and reduced levels of use
Individual components (ties, fixtures)	Contributing	Contributing if substantially intact	Contributing if substantially intact
Foundations alone	Contributing	Non contributing	Non contributing
Foundations with interior features and details	Contributing	Contributing	Non contributing
Architecturally distinctive structures or functions	Contributing	Contributing	(none present)

Source: HRI

On this evaluation grid, any features relating to the Camden and Amboy Period are considered to be contributing, because this period is so significant for railroad history, and little is known about the form, structure and evolution of early railroad infrastructure on the C&ARR. Individual elements, such as the stone ties, are of considerable historic value and would be considered for salvage and conservation.

For the subsequent Coal Docks period a higher standard is proposed, in that building foundations without associated interior stratification and features are not regarded as contributing elements. It seems likely, from the assessment already completed, that the majority of the identified structures will fall into this category. Individual elements, such as signaling or other fixtures, will only be considered contributing if they show substantial integrity. No elements of this period have been identified with certainty other than the light poles and the catenary structures. Both these groups of features are held to be contributing.

In the final 1950 to 1965 period, only distinctive and intact railroad features will be judged to be contributing.

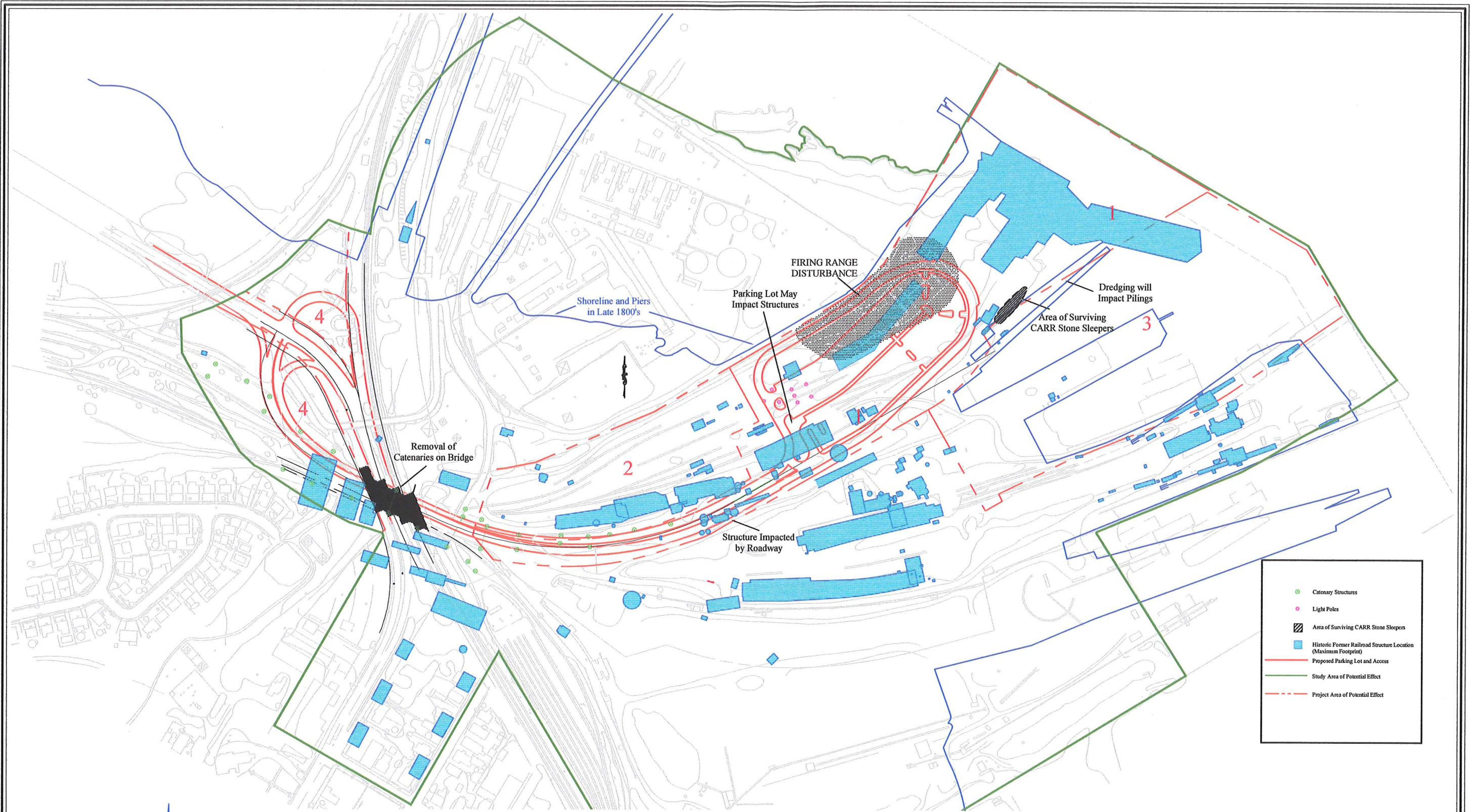
This evaluation system enables decisions to be concerning appropriate treatment of archaeological resources which may be adversely affected by the proposed project. These treatment options are detailed below (Impact Assessment).

### 5.3 Impacts to Section 4(f) Properties

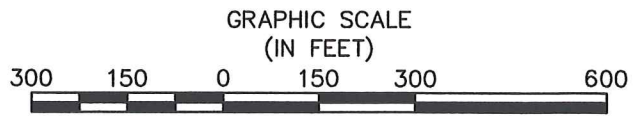
Impacts of the Proposed Action are described below and identified on Figure 5-1, Impacts to Section 4(f) Properties.

The proposed action would result in the physical taking of a 5.40-acre portion of the C&ARRHD relating to the access road (1.23-acres), parking lot (4.66-acres), terminal building pad (0.10-acre), and pedestrian walkway (0.41-acre). In addition, dredging to provide nearshore depths for the ferry operation would affect 3.93-acres within the offshore area.

C:\Projects\South Amboy Ferry Terminal\Impacts.dwg LAYOUT: 11x17 low profile 5-1



	Catenary Structures
	Light Poles
	Area of Surviving CARR Stone Sleepers
	Historic Former Railroad Structure Location (Maximum Footprint)
	Proposed Parking Lot and Access
	Study Area of Potential Effect
	Project Area of Potential Effect



DATE: 4/21/03	DRAWN BY: HRI	REVIEWED BY: MJM	SCALE: AS SHOWN	PROJECT # 413	SHEET # 1 OF 1
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DATE	REVISION	DRAWN BY	REVIEWED BY	RELEASED BY
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IMPACTS TO SECTION 4(f)  
PROPERTIES  
SOUTH AMBOY FERRY TERMINAL  
CITY OF SOUTH AMBOY, NEW JERSEY

SOURCE:  
HUNTER RESEARCH, INC. (4/16/03)

FIGURE # **5-1**

- **Upland access roadway between Main Street and the ferry parking area**

As currently configured, construction of this road would probably impact the series of water towers shown on early 20<sup>th</sup> century maps of the rail yard. These concrete footings probably relate to Structure 44 on the building inventory map. Removal of the Conrail bridge will result in the removal of two catenary structures.

- **Parking area and ferry terminal**

The parking area would be placed in an area of known railroad features dating from the Camden and Amboy period and later. These all lie in the western portion of the area. One of the features from the 1830's, perhaps a locomotive house, is believed to lie in this area, although it has probably been severely compromised by the construction of the building erected after the 1950 explosion. The site of a car house of the 1870's period has been destroyed by the construction of the firing range. Although the parking area will be built at or above present grade there will inevitably be ground disturbance from clearance, site preparation and drainage.

The Ferry Terminal and associated walkways and piers will lie in an area just to the southwest of the mapped location of the 19<sup>th</sup> century ferry terminals, which lay in the current wetland area and out into current tidal waters. Survey of exposed shoreline features on the southeast side of this area has shown that 19<sup>th</sup> century features, including stone railroad ties, remain here.

- **Dredging of the ferry basin, slips, and access channel**

These actions will chiefly affect a portion of the complex, multi-period piling settings in the tidal water.

- **Temporary Dredged Material Storage Area**

An approximately 4-acre portion of the site is proposed as a temporary storage and dewatering site for the dredged material generated during excavation of the ferry access and berths. Although trenches excavated within this area (Nos. 4, 5, 6, and 9) were firmly negative, potential foundations were identified in Transect C. and F. There may be impacts to contributing archaeological resources, and treatment options are discussed below.

#### **5.4 Alternatives to the Use of 4(f) Properties**

A series of alternatives were evaluated to determine whether there were any feasible and prudent alternatives to the use of the historic resources. In addition, the alternatives were examined as a means to avoid or mitigate potential effects on the historic properties. These alternatives included the no action alternative, alternative development sites, alternative ferry dock locations, and alternative access road location and configuration.

#### **5.4.1 No Action Alternative**

Under this alternative, the proposed access road, parking, ferry terminal, and public access walkway would not be constructed. Existing traffic patterns and roadways would remain unchanged.

Although the No Action Alternative would avoid direct impacts to the historic district, it would remove the focus of historic site investigation and result in further neglect and deterioration of exposed contributing elements.

Implementation of this alternative would not further the City of South Amboy's goals regarding the provision of improved transportation movement and improved air quality. Implementation of this alternative would similarly not realize the City of South Amboy's Master Plan and Redevelopment Plan goals regarding waterfront redevelopment and its associated improved public access and public recreation objectives. This alternative would also not provide the funding impetus to remediate the former ConRail site, thereby postponing the brownfields cleanup to a subsequent time in the future. For these reasons, this alternative was not determined to be feasible and prudent.

#### **5.4.2 Alternative Development Sites**

Under the preferred action alternate, the ferry development would be located east of the NJ Transit Railroad Bridge across Raritan Bay at the site of a former rail and ferry operation. This site is within the historic Camden & Amboy Railroad Historic District. The land is vacant and available for development within an immediate time frame. There are no freshwater wetlands on the site. Although there is a substantial coastal saltmarsh along the headland, location of the ferry landing and associated dredging for the ferry can avoid impacts to this area. Access to the site can be provided to the site using the reconstructed ConRail Bridge over Main Street.

In order to avoid direct impacts to the Camden & Amboy Railroad Historic District, several alternative development sites were evaluated, including one site to the west of the NJ Transit Railroad Bridge across Raritan Bay (Site 1), and two additional sites east of the Railroad Bridge (Sites 2 and 4). The location of the alternative sites are illustrated in Figure 3-2 and described below.

##### **Alternate Development Site 1**

Alternate Site 1 is located in an undeveloped area to the west of the NJ Transit Coast Line. Access could be provided from Main Street to the south. Water depths would require some dredging depending upon the length of the ferry pier extending out from the shoreline. A fringe of coastal saltmarsh cordgrass (*Spartina alterniflora*) exists along the intertidal area.

However, because of the clearances associated with the NJ Transit Coast Line bridge, the swing bridge would be required to open to allow ferry passage through the bridge. Since peak hour ferry use would occur concurrently with peak commuter rail usage, frequent required openings of



the bridge would pose a substantial conflict. For this reason, this alternate was not feasible and prudent.

### **Alternate Development Site 2**

Alternate Site 2 is located on the property currently occupied by Jersey Central Power & Light (JCP&L)/Reliant Energy. There is an existing bridge access to the site over Main Street and the Coast Line along a single-lane steel bridge. This bridge, however, and its associated curve radii would not provide the vehicular capacity needed to accommodate the anticipated traffic demand to the ferry landing, thereby requiring the construction of a new structure.

An existing pier and sufficient depth would provide access for a limited ferry operation, although reconstruction of the pier and dredging would be required to accommodate the level of ferry service proposed.

In addition to access constraints, a major limitation of this site is that the JCP&L facility is undergoing decommissioning, but the timing of that process and as well as the potential environmental remediation that will be required at the site is unknown. The City of South Amboy would be unable to acquire title to this property within a time frame suitable for construction of a permanent ferry landing. The site has several above-ground and underground storage tanks and, as with other old power installations, has significant potential for extensive soil and groundwater contamination. The site is currently proposed to support a very limited, short-term interim ferry operation to assist in easing congestion into and out of New York City. For the reasons identified above, this alternate was not a feasible and prudent alternative to the proposed action site.

### **Alternate Development Site 4**

Alternate Site 4 is located east of McCormick Aggregate, and is represented as a vacant, former industrial tract north of Rosewell Street. The presence of aboveground storage tanks suggests the former use of a portion of this property and the potential for environmental remediation. The waterfront is a gravelly beach with reasonable water depths a short distance offshore.

The primary disadvantage of this site is that the interior of the site is comprised of jurisdictional freshwater wetlands. Any construction of ferry ancillary facilities would require filling of wetland areas. Further, providing vehicular site access to this location would require directing traffic flow on secondary streets through existing residential areas. For these reasons, this alternate was not determined to be a feasible and prudent alternative.

#### **5.4.3 Ferry Landing Alternatives**

The preferred location of the ferry landing places the ferry dock to the immediate south of the former main port facility located at the site, and connects the dock to the mainland through a series of elevated walkways. It requires the least amount of dredging of any in-basin alternate (approximately 36,000 cy), avoids direct impacts to existing coastal saltmarsh through use of

elevated walkways and wave barriers, and allows the ferry to be proximal to the proposed terminal and parking.

As with the other in-basin alternatives, i.e., Alternatives 3, and 4, the preferred alternative requires an offshore breakwater ranging from approximately 800 to 900 feet in length. The proposed floating breakwater would have minimal effect on offshore resources since it is anchored with a series of pilings with negligible footprint of disturbance.

Several alternative ferry landing locations within the proposed development site were evaluated to avoid or lessen impacts to offshore historic resources. The location of the alternative landing sites are illustrated in Figure 3-3 and described below.

### **Alternate Ferry Location 1**

Alternate location 1 is along the western edge of the long pier that extends into the bay along the southern boundary of the project site. This location is characterized as having sufficient depths for ferry operation. This location would require the shortest breakwater, since the pier, per se, would provide protection against the worst of the long fetch northeastern storms. Of the ferry location alternatives evaluated, this alternative is the only one that would reduce potential construction impacts to offshore resources.

The immediate disadvantage of this site is that the pier is currently actively used by McCormick Aggregate and is the primary location for their associated aggregate barge operation. Further, because of the distance that the pier extends into the Bay, there is no practical way to conveniently convey passengers from a mainland parking location to the ferry at this location. Thus, this alternative was not determined to be feasible and prudent.

### **Alternate Ferry Location 3**

Alternate location 3 was the originally proposed site of the ferry and would have been located where, historically, earlier ferries had shuttled coal back and forth across the bay. However, site-specific field surveys, conducted as part of the environmental review process, identified a substantial coastal saltmarsh extending within the intertidal zone at this location. Due to the value of these wetlands in terms of productivity and habitat, and the degree of damage that location of the ferry would have wrought, primarily due to dredging, this alternate was not determined to be feasible and prudent.

### **Alternate Ferry Location 4**

Alternate location 4 would provide the shortest pedestrian route between the parking and terminal area and the ferry landing. However, due to its landwardmost location, this alternate results in the greatest quantity of dredging (approximately 75,000 cy). Furthermore, interviews with ferry operators indicated some concern regarding the ability to have sufficient maneuvering room at this location. All of the operators queried felt that the ferry would need to turn around at this location rather than reverse across the basin. The increased dredging quantity results in

disturbance to the largest offshore footprint and potentially the greatest effect to offshore resources.

On the basis of the increased dredging, footprint of disturbance, and operational concerns, this alternative was not determined to be feasible and prudent.

#### **5.4.4 Access Road Alternatives**

The proposed southern Access Road is the preferred alternative. The Access Road follows the route of an existing unpaved roadway therefore minimizing impacts to the area. The road is proposed as a two-lane facility with shoulders. Figure 5-2, Access Road Alternatives, depicts the preferred southern access road alternative to the proposed ferry parking and terminal as well as an access road alternative along the northern portion of the development site.

The proposed northern access road alternative approaches the proposed ferry parking on the north side. The major limitation of this alignment was the horizontal geometry of the access road ramp leading to the Main Street Bridge. The proposed Main Street Bridge structure, which is under reconstruction independent of the ferry development, would need to be constructed on a curve and be super-elevated which would be both undesirable from an engineering perspective and costly. The Conrail track relocation would also require to be shifted to the south to accommodate the realigned access road ramp, which will impact the existing residences to the south. For these reasons, the alignment was not determined to be feasible and prudent.

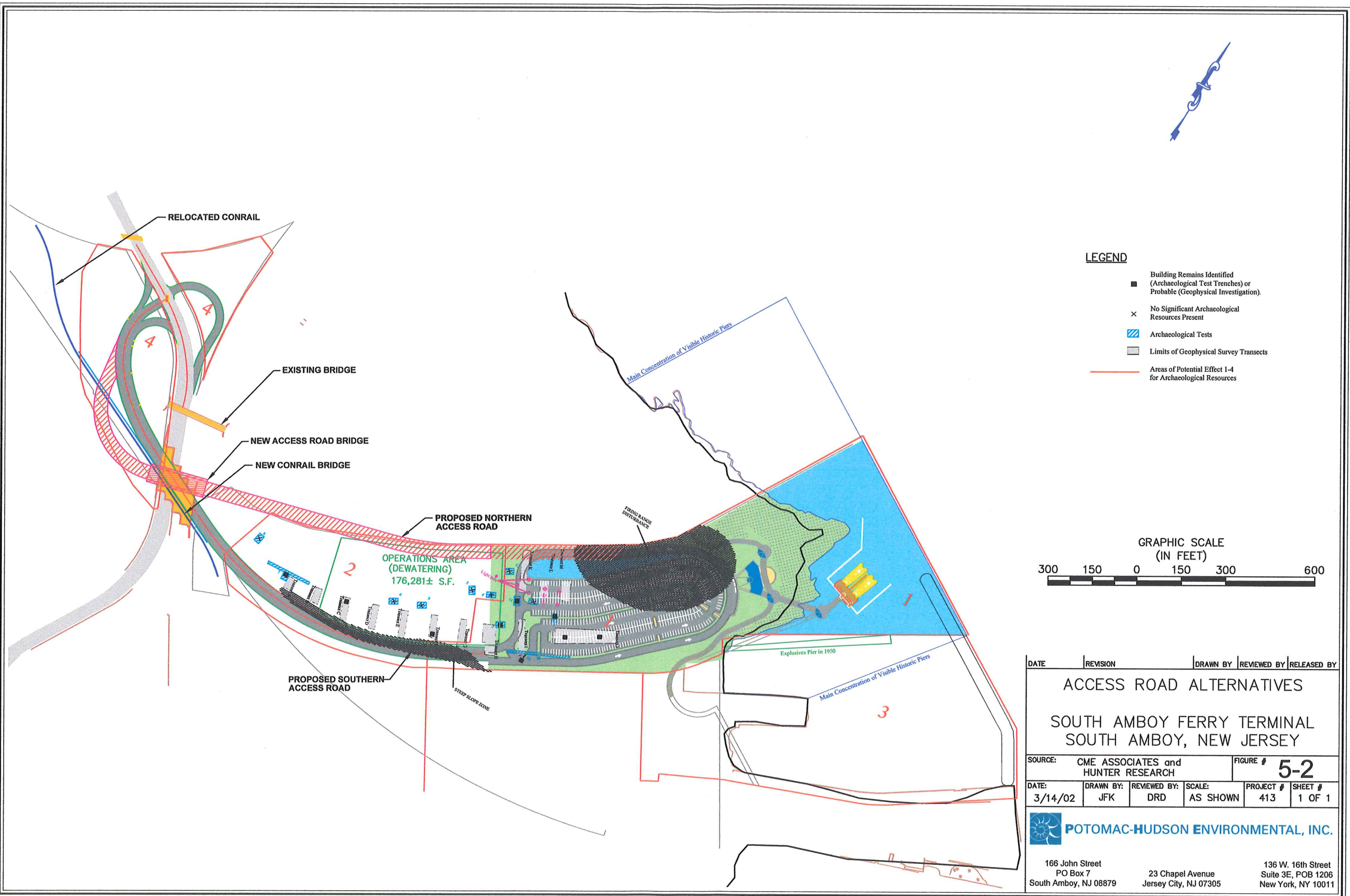
#### **5.4.5 Parking Alternatives**

The proposed action proposes an approximately 500-space, at-grade parking facility located at the eastern end of the site. The location of the parking area is required to be within convenient walking distance of the terminal and ferry pier. Because of the size and location requirements of the parking area, no other feasible and prudent alternatives were identified.

#### **5.4.6 Dredged Material Disposal Alternatives**

Under the proposed action alternative, all dredged material would be disposed of in an upland location immediately west of the proposed ferry parking area, as shown in Figure 5.1, Project Impacts. An approximately four-acre dredged material containment area would be constructed with an enclosure of berms composed of granular material to promote water filtration. A trench would be located around the outer perimeter of the containment area to collect the filtered water. This trench would, in turn, be connected to a grassed swale that would transport the collected effluent to a retention pond prior to release to the bay. As part of the proposed development of the terminal, the site would require fill to raise the grade. Preliminary review of analytical sampling data of the sediments to be dredged by the New Jersey Department of Environmental Protection has indicated their applicability for upland disposal and reuse. The use of dredged material as fill is an environmentally sound alternative to the importing of other types of upland fill to the site.

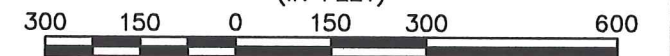
C:\Projects\SouthAmboyFerryTerminal\codfiginals\alternatives with cut without noise wall.dwg LAYOUT1:scheme5



**LEGEND**

- Building Remains Identified (Archaeological Test Trenches) or Probable (Geophysical Investigation).
- × No Significant Archaeological Resources Present
- ▨ Archaeological Tests
- ▭ Limits of Geophysical Survey Transects
- ▨ Areas of Potential Effect 1-4 for Archaeological Resources

GRAPHIC SCALE  
(IN FEET)



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**ACCESS ROAD ALTERNATIVES**

**SOUTH AMBOY FERRY TERMINAL  
SOUTH AMBOY, NEW JERSEY**

SOURCE: CME ASSOCIATES and HUNTER RESEARCH	FIGURE # <b>5-2</b>
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DATE: 3/14/02	DRAWN BY: JFK	REVIEWED BY: DRD	SCALE: AS SHOWN	PROJECT # 413	SHEET # 1 OF 1
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Other dredged material alternatives that have been evaluated include:

- Off-site locations

Off-site locations to the west of Main Street were determined to not be feasible and prudent due to the logistics and costs involved with transporting the dredged material more than one-half mile from the dredging site, and the lack of accessible locations for dewatering. The area to the north of the site, represented by the JCP&L/Reliant Energy property, is not controlled by the City and, therefore, not available on a timely basis for deposition of dredged material. Further, this site is anticipated to have substantial environmental problems for which detailed remedial investigations have not yet been undertaken. The area to the south of the site is an active facility, McCormick Aggregate, and is similarly not controlled by the City.

## **5.5 Efforts to Minimize Harm**

### **5.5.1 Identification and Evaluation**

#### **Background Research**

An inventory of structures and facilities originally constructed within both the study APE and the project APE has been compiled in graphic and inventory form during the course of this assessment. Additional background research for the purpose of more fully understanding what structures/facilities were constructed within specific historical contexts and what might persist today as archeological features could be undertaken, chiefly through locating private collections of photographs or other materials and consultation of PRR records held by Conrail. The greater bulk of the research necessary for characterization and evaluation of the resource is considered to have been completed.

#### **Field Verification**

A plan for verification of potential facilities previously known or identified during the background research was agreed upon by the SHPO, FHWA, NJDOT, and the City and implemented during the Environmental Assessment process. This work has characterized the archaeological resources on the project site to a level at which treatment options can be developed.

#### **Salvage**

Specific individual historic elements will be salvaged and creatively re-used in the design for the new facilities. Specifically identified elements include light poles and the stone railroad ties of the early Camden and Amboy period. One or more of the catenary structures of the later 1930's PRR electrification will also be incorporated into the project.

### **5.5.2 Consultation and Development of a Mitigation Plan**

During the planning a detailed mitigation plan will be developed. This will include provision for minimization of effects, monitoring, and other mitigation activities, and will be submitted by the City to all consulting parties for comment. At a minimum, the plan would include procedures to collect archeological data and would develop a narrative about how the South Amboy rail and maritime facilities functioned in regional cultural and economic contexts.

Where avoidance is not prudent and feasible, procedures for evaluation and documentation of archaeological or other historic resources would be followed. These procedures comprise archaeological investigation prior to construction, and observational or detailed archaeological monitoring during construction, including provision for cessation of construction for determined time periods to allow documentation to be completed. Areas that will be subject to construction monitoring or other archaeological investigation will be indicated on representative plans. Provisions for the work will be included in the appropriate construction specifications.

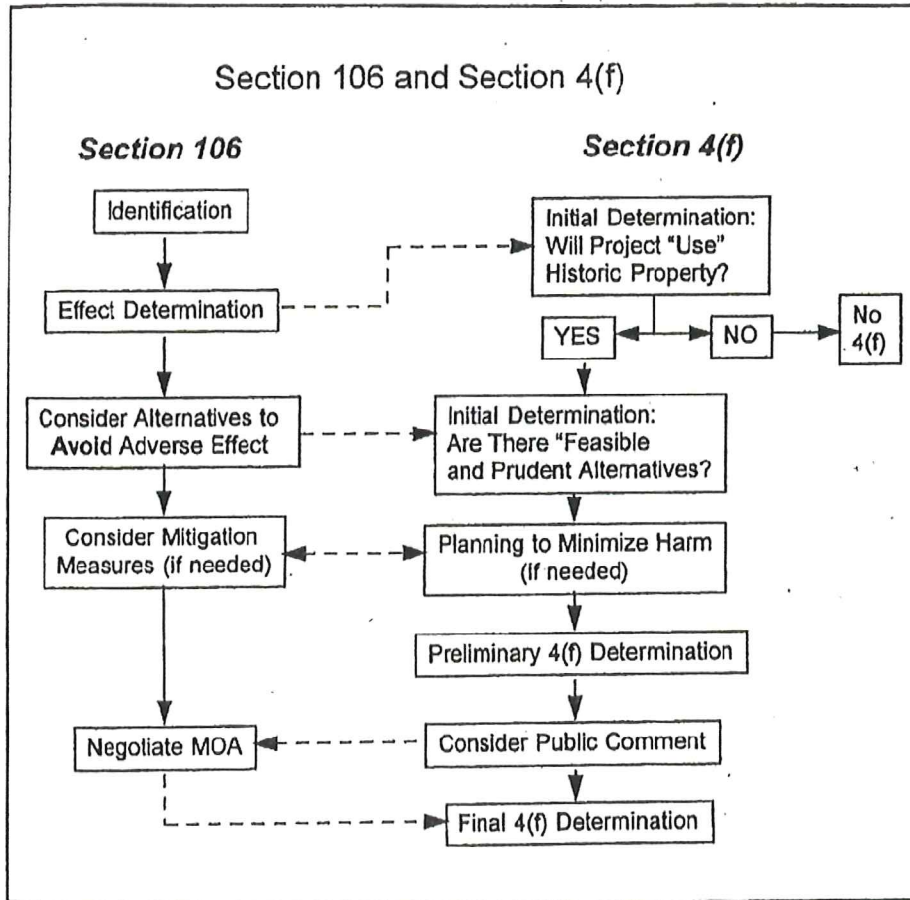
### **5.5.3 Public Involvement**

Following agreement on the draft mitigation plan, a public meeting will be held during which the proposed mitigation will be described and the public will have an opportunity to comment. Individuals/groups who have an identified interest in the historic properties located within the APE will be specifically invited to attend. The City will be responsible for scheduling the meeting, issuing invitations and providing public notice of the meeting, and compiling documentation of the meeting, including copies of letters of invitation and public announcements of the meeting, list of attendees, and a memorandum of record of comments made or issues raised and all responses provided. Any comments made during the meeting will also be considered in modifying the mitigation plan. Opportunities will be taken to explain the history and significance of the site to the public using the facility through static interpretive displays or other media.

## **5.6 Coordination**

Section 4(f) procedures have been coordinated in accordance with procedures under 36 CFR 800 and Section 106 of the National Historic Preservation Act as graphically shown on Figure 5-3, Coordinating Section 4(f) and Section 106 Procedures. As the agent of the Federal Highway Administration, the New Jersey Department of Transportation will take the lead role in ensuring coordination between these two regulatory procedures and NEPA. The New Jersey State Historic Preservation Officer will be a Consulting Party under 36CFR 800.2c to reflect the interests of the State and its citizens, and to advise and assist the NJDOT in fulfilling these regulatory requirements.

As part of the project coordination, public information meetings were held on 8 February 2001 and 27 June 2001. The purpose of these meetings was to advise the public as to the status of the project and provide information regarding the cultural resource investigations and Section 106



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SOURCE:

AltaMira Press

FIGURE #

5-3

**Coordination of Section 4(f) and  
Section 106 Procedures  
South Amboy Ferry Terminal Project  
City of South Amboy, New Jersey**

process. Additional information on these public information meetings is included in Appendix D, Public Involvement.

A Memorandum of Agreement (MOA) has been prepared under 36CFR 800.6c. A copy of this MOA is included as Appendix C.



## **6.0 COMMENTS AND COORDINATION**

### **6.1 Public Involvement**

Public involvement was developed and implemented by the City of South Amboy. The intent of the public involvement is to optimize the level of coordination with the general public, appropriate governmental agencies, and the design team members, and to coordinate the public awareness activities with the entire process. Information pertaining to the project will be shared, presented, and made available for review and comment. Ideas, concerns, and recommendations from the public will be considered and addressed in an appropriate manner.

Two Public Information Center meetings have been held to inform the local resident and commercial community regarding status of the project, anticipated project impacts, and the results of on-going cultural resource investigations. These information meetings have been conducted pursuant to the Council on Environmental Quality (CEQ) regulations and Section 106 procedures.

The Public Information Center meetings were held at the South Amboy Senior Citizens Center on 27 June 2002 between the hours of 4:00 pm and 7:00 pm and 8 February 2001 between the hours of 4:00 pm and 8:00 pm. The meetings were advertised in The Amboy Beacon and Home News Tribune newspapers and local cable TV network. In addition, individual letters were sent to specific historical groups who were felt to have an interest in the project site, including the Middlesex County Cultural & Heritage Commission, Sayreville Historical Society, and South Amboy Historical Society. Handouts were made available at the meeting that described the proposed project and the Section 106 process and provided an update of the overall project status. A sign-in sheet was available at both meetings and the proceedings were recorded.

Each meeting commenced with an introduction by a City official who described the overall intent of the project. This was followed by a discussion of the engineering and traffic issues by the project engineering consultant, historic issues by the cultural resource specialist, and environmental issues by the environmental consultant. A number of boards on easels were used to illustrate key project issues.

During the 8 February 2001 meeting, ten individuals attended the meeting. The only questions were concerning potential traffic concerns along Broadway.

During the 27 July 2002 meeting, three residents attended the meeting. Again, the only comment regarded potential traffic congestion on local streets.

A public hearing will be held following the release of the EA. The hearing will be announced in a timely manner upon document approval. The hearing will be transcribed, and verbal and written comments from the public and government entities during and after the comment period will be summarized and addressed in an appropriate manner. The early coordination, public involvement, and project development will be conducted in accordance with the Code of Federal Regulations, 40 CFR 1502.20 and FHWA 23 CFR 771.111, and latest NJDOT procedures and regulations.

## **6.2 Agency Involvement**

Early coordination with appropriate agencies was initiated to solicit their views and assure that adequate environmental analysis, documentation, and related environmental requirements are met. Requests for information were solicited from specific agencies and agency responses are discussed within the document in their appropriate sections.

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**APPENDIX A**

**REFERENCES**

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**APPENDIX B**  
**AGENCY CORRESPONDENCE**

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## State of New Jersey

Department of Environmental Protection

Christine Todd Whitman  
Governor

Robert C. Shinn, Jr.  
Commissioner

Division of Parks and Forestry  
Office of Natural Lands Management  
Natural Heritage Program  
P.O. Box 404  
Trenton, NJ 08625-0404  
Tel. #609-984-1339  
Fax. #609-984-1427

October 12, 2000

Timothy R. DeGraff  
PMK Group  
629 Springfield Road  
Kenilworth, NJ 07033

Re: South Amboy Regional Intermodal Transportation Center

Dear Mr. DeGraff:

Thank you for your data request regarding rare species information for the above referenced project site in South Amboy City, Middlesex County.

The Natural Heritage Data Base does not have any records for rare plants, animals, or natural communities on the site. Attached is a list of rare species and natural communities that have been documented from Middlesex County. This county list can be used as a master species list for directing further inventory work. If suitable habitat is present at the project site, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish and Wildlife, Endangered and Nongame Species Program.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. F. Breden'.

Thomas F. Breden  
Supervisor

cc: Lawrence Niles  
Thomas Hampton  
NHP File No. 00-4007443






UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE

Habitat Conservation Division  
James J. Howard Marine  
Sciences Laboratory  
74 Magruder Road  
Highlands, New Jersey 07732

October 5, 2000

TO: Timothy DeGraff  
PMK Group  
629 Springfield Rd.  
Kenilworth, NJ 07033

SUBJECT: South Amboy Intermodal Transportation Center  
Middlesex County

 Karen Greene  
(Reviewing Biologist)

We have reviewed the information provided to us regarding the above subject project. We offer the following preliminary comments pursuant to the Endangered Species Act, the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act:

Endangered and Threatened Species

- There are no endangered or threatened species in the project area.
- The following endangered or threatened species may be present in the project area:

shortnose sturgeon (*Acipenser brevirostrum*)

sea turtles:	<input checked="" type="checkbox"/> loggerhead ( <i>Caretta caretta</i> )	<input checked="" type="checkbox"/> Kemp's ridley ( <i>Lepidochelys kempi</i> )
	<input checked="" type="checkbox"/> green ( <i>Chelonia mydas</i> )	<input checked="" type="checkbox"/> leatherback ( <i>Dermochelys coriacea</i> )

DEPENDENT UPON PROJECT DETAILS. POSSIBLE RECOMMENDATIONS MAY INCLUDE:

Insufficient information available in the proposed project.

Anadromous Fishes

- The following may be present in the project area:

<input checked="" type="checkbox"/> blueback herring ( <i>Alosa aestivalis</i> )	<input checked="" type="checkbox"/> alewife ( <i>Alosa pseudoharengus</i> )
<input checked="" type="checkbox"/> striped bass ( <i>Morone saxatilis</i> )	<input checked="" type="checkbox"/> American shad ( <i>Alosa sapidissima</i> )

DEPENDENT UPON THE PROJECT DETAILS POSSIBLE RECOMMENDATIONS INCLUDE:

If in-water work is proposed in the Raritan River, a time of year restriction may be necessary.

Essential Fish Habitat

The project area has been designated as Essential Fish Habitat (EFH) for one or more species. When details of the project are made available and permit applications have been made, conservation recommendations may be given. For a listing of EFH and further information, please go to our website at:

<http://www.nero.nmfs.gov/ro/doc/newefh.html>.  
-If you wish to discuss this further, please call 732-872-3023-





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

New Jersey Field Office  
Ecological Services  
927 North Main Street, Building  
Pleasantville, New Jersey 08232  
Tel: 609-646-9310  
Fax: 609-646-0352  
<http://njfieldoffice.fws.gov>



IN REPLY REFER TO:  
ES-02\616

SEP 27 2002

Mr. David R. Draper  
Potomac-Hudson Environmental, Inc.  
P.O. Box 7, 166 John Street  
South Amboy, New Jersey 08879  
Fax Number: (732) 525-9254

Reference: Threatened and endangered species review within the vicinity of the proposed South Amboy Ferry Project located within South Amboy, Middlesex County, New Jersey.

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced proposed project pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of federally listed endangered and threatened species. The following comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comment by the Service as afforded by other applicable environmental legislation.

Except for an occasional transient bald eagle (*Haliaeetus leucocephalus*), no other federally listed or proposed threatened or endangered flora or fauna under Service jurisdiction are known to occur within the vicinity of the proposed project site. Therefore, no consultation pursuant to Section 7 of the Endangered Species Act is required between the federal action agency and the Service. If additional information on federally listed species becomes available, or if project plans change, this determination may be reconsidered.

Enclosed is current information regarding federally listed and candidate species occurring in New Jersey. The Service encourages federal agencies and other planners to consider candidate species in project planning. The addresses of State agencies that may be contacted for current site-specific information regarding federal candidate and State-listed species are also enclosed.

Reviewing Biologist:

Authorizing Supervisor:

Enclosures: Current summaries of federally listed and candidate species in New Jersey  
Addresses for additional information on candidate and State-listed species  
Permit requirements for activities in wetlands

No part of this response should be used out of context and if reproduced, should appear in its entirety.



## FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY



An **ENDANGERED** species is any species that is in danger of extinction throughout all or a significant portion of its range.

A **THREATENED** species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

	COMMON NAME	SCIENTIFIC NAME	STATUS
<b>FISHES</b>	Shortnose sturgeon*	<i>Acipenser brevirostrum</i>	E
<b>REPTILES</b>	Bog turtle	<i>Clemmys muhlenbergii</i>	T
	Atlantic Ridley turtle*	<i>Lepidochelys kempii</i>	E
	Green turtle*	<i>Chelonia mydas</i>	T
	Hawksbill turtle*	<i>Eretmochelys imbricata</i>	E
	Leatherback turtle*	<i>Dermochelys coriacea</i>	E
	Loggerhead turtle*	<i>Caretta caretta</i>	T
<b>BIRDS</b>	Bald eagle *	<i>Haliaeetus leucocephalus</i>	T
	Piping plover	<i>Charadrius melodus</i>	T
	Rosetta tern	<i>Sterna aougalli aougalli</i>	E
<b>MAMMALS</b>	Eastern cougar	<i>Felis concolor cougar</i>	E+
	Indiana bat	<i>Myotis sodalis</i>	E
	Gray wolf	<i>Canis lupus</i>	E+
	Delmarva fox squirrel	<i>Sciurus niger cinereus</i>	E+
	Blue whale*	<i>Balaenoptera musculus</i>	E
	Finback whale*	<i>Balaenoptera physalus</i>	E
	Humpback whale*	<i>Megaptera novaeangliae</i>	E
	Right whale*	<i>Balaena glacialis</i>	E
	Sei whale*	<i>Balaenoptera borealis</i>	E
	Sperm whale*	<i>Physeter macrocephalus</i>	E

	COMMON NAME	SCIENTIFIC NAME	STATUS
INVERTEBRATES	Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	E
	Northeastern beach tiger beetle	<i>Cicindela dorsalis dorsalis</i>	T
	Mitchell's bay butterfly	<i>Neonympha m. mitchellii</i>	E+
	American burying beetle	<i>Nicrophorus americanus</i>	E+
PLANTS	Small whorled pogonia	<i>Isotria medeoloides</i>	T
	Swamp pink	<i>Helonias bullata</i>	T
	Knieskern's beaked rush	<i>Rhynchospora knieskernii</i>	T
	American chaffseed	<i>Schwalbea americana</i>	E
	Sensitive joint-wetch	<i>Aeschynomene virginica</i>	T
	Seabeach amaranth	<i>Amaranthus pumilus</i>	T

STATUS:			
E	endangered species	PE	proposed endangered
T	threatened species	PT	proposed threatened
+	presumed extirpated**		

\* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

\*\* Current records indicate the species does not presently occur in New Jersey, although the species did occur in the State historically.

Note: for a complete listing of Endangered and Threatened Wildlife and Plants, refer to 50 CFR 17.11 and 17.12.

For further information, please contact:

U.S. Fish and Wildlife Service  
 New Jersey Field Office  
 927 N. Main Street, Building D  
 Pleasantville, New Jersey 08232  
 Phone: (609) 646-9310  
 Fax: (609) 646-0352



# FEDERAL CANDIDATE SPECIES IN NEW JERSEY

**CANDIDATE SPECIES** are species that appear to warrant consideration for addition to the federal List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the U.S. Fish and Wildlife Service encourages federal agencies and other planners to give consideration to these species in the environmental planning process.

SPECIES	SCIENTIFIC NAME
Bog asphodel	<i>Narthecium americanum</i>
Wetland panic grass	<i>Panicum hirstii</i>

*Note: For complete listings of taxa under review as candidate species, refer to Federal Register Vol. 64, No. 205, October 25, 1999 (Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species).*

## FEDERAL CANDIDATE AND STATE-LISTED SPECIES

Candidate species are species under consideration by the U.S. Fish and Wildlife Service (Service) for possible inclusion on the List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the Service encourages federal agencies and other planners to consider federal candidate species in project planning.

The New Jersey Natural Heritage Program maintains the most up-to-date information on federal candidate species and State-listed species in New Jersey and may be contacted at the following address:

Mr. Thomas Breden  
Natural Heritage Program  
Division of Parks and Forestry  
P.O. Box 404  
Trenton, New Jersey 08625  
(609) 984-0097

Additionally, information on New Jersey's State-listed wildlife species may be obtained from the following office:

Dr. Larry Niles  
Endangered and Nongame Species Program  
Division of Fish and Wildlife  
P.O. Box 400  
Trenton, New Jersey 08625  
(609) 292-9400

If information from either of the aforementioned sources reveals the presence of any federal candidate species within a project area, the Service should be contacted to ensure that these species are not adversely affected by project activities.

## PERMIT REQUIREMENTS FOR ACTIVITIES IN WETLANDS

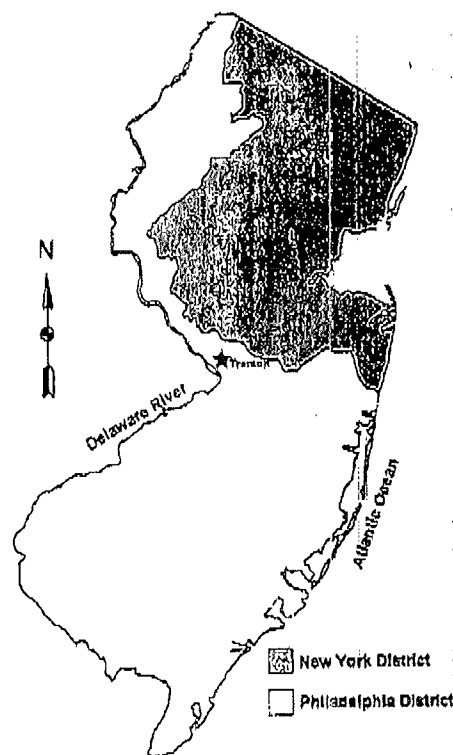
A review of the Service's National Wetland Inventory maps indicates that wetlands occur within the project area. Wetlands provide habitats for a variety of migratory and resident species of fish and wildlife. Thus, the Service discourages activities in and affecting the Nation's wetlands that would unnecessarily damage, degrade, or destroy the values associated with them. Project activities in wetlands may require federal and State permits from the U.S. Army Corps of Engineers pursuant to the Clean Water Act of 1977 (33 U.S.C. 1344 *et seq.*), and the New Jersey Department of Environmental Protection and Energy pursuant to the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 *et seq.*). Thus, if work is proposed in wetlands, the following offices must be contacted to determine federal and State permit requirements, respectively:

### Federal Permitting Authority:

Regulatory Branch  
 U.S. Army Corps of Engineers  
 New York District  
 26 Federal Plaza  
 New York, New York 10278-0090  
 (212) 264-3996  
 Fax #: (212) 264-4260

or

Regulatory Branch  
 U.S. Army Corps of Engineers  
 Philadelphia District  
 100 Penn Square East  
 Philadelphia, Pennsylvania 19107-3390  
 (215) 656-6725  
 Fax #: (215) 656-6724



### State Permitting Authority:

Land Use Regulation Program  
 Department of Environmental Protection and Energy  
 CN 401  
 Trenton, New Jersey 08625-0401  
 (609) 292-1235  
 Fax #: Northern Counties (609-292-1231); Southern Counties (609-292-8115)

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**APPENDIX C**

**MEMORANDUM OF AGREEMENT**

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**MEMORANDUM OF AGREEMENT  
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION AND  
THE NEW JERSEY STATE HISTORIC PRESERVATION OFFICER  
REGARDING THE INTERMODAL FERRY TRANSPORTATION CENTER  
CITY OF SOUTH AMBOY, MIDDLESEX COUNTY, NEW JERSEY**

**WHEREAS**, the City of South Amboy proposes to construct a ferry facility [including access roadway, parking, terminal and in-water improvements] to accommodate up to three ferry vessels in South Amboy, Middlesex County using funds provided by the Federal Highway Administration (FHWA) via the New Jersey Department of Transportation (NJDOT); and

**WHEREAS**, the FHWA, the New Jersey State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (Council), and the NJDOT executed a Programmatic Agreement in November of 1996 which stipulates how FHWA's Section 106 responsibilities for NJDOT-administered federal aid projects will be satisfied; and

**WHEREAS**, in accordance with that agreement, the NJDOT has consulted with the SHPO in order to determine the area of potential effect (APE), to identify significant National Register eligible and listed properties, and to assess the effects of the project on both eligible and listed properties within the APE pursuant to the requirements of 36 CFR Part 800, the regulations implementing Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C.470f); and

**WHEREAS**, background and field research have indicated that physical remains of the Camden and Amboy [ca. 1831 - 1871] and Pennsylvania [ca. 1871- 1965] Railroads persist within and beyond the APE, but the integrity of the physical remains in the APE is low; and

**WHEREAS**, the historic significance of the property within the APE relates primarily to it being the location of nationally significant events, the feeling or sense of place conveyed by the few physical remains, and the setting of the former rail yard and piers; and

**WHEREAS**, previous consultation on other projects resulted in an initial June 26, 1975 opinion (and several reiterations of that opinion in the context of federally funded

roadway and other projects) that the Camden and Amboy Railroad (Main Line) Historic District is eligible for listing in the National Register of Historic Places; and

**WHEREAS**, previous consultation has also indicated that the period of significance for the Camden & Amboy Railroad (Main Line) Historic District spans the tenures of both railroad companies, and that understanding the relationships between the various archeological remains and evaluating their significance is a complex process requiring extensive background research; and

**WHEREAS**, consultation for other projects affecting the Camden & Amboy Railroad (Main Line) Historic District has focused on identifying and protecting contributing resources and features of the historic district; introducing historically compatible new bridges, stations, and structures; and adequately mitigating the adverse effects resulting from new construction or removal of original features; and

**WHEREAS**, Hunter Research has compiled an inventory of visible railroad remains within the APE [*The Catenary Structures at the Intermodal Ferry Transportation Center, South Amboy, Middlesex County, New Jersey with a note on Camden and Amboy Railroad Stone Sleepers, Historic Context, Description and Recommendations*; Ian Burrow, December 2002] and found that only catenary structures and displaced stone sleepers, and two coal thawing sheds and associated infrastructure remain intact within the APE of the project; and

**WHEREAS**, the FHWA has determined that the construction of this project as proposed will have an adverse effect on the Camden & Amboy Railroad (Main Line) Historic District due to the alteration and/or removal of the catenary structures and stone sleepers; and

**WHEREAS**, the NJDOT and FHWA have considered alternatives to avoid or minimize the adverse effects and have found that they are not feasible; and

**WHEREAS**, a Camden and Amboy corridor management study entitled *Camden and Amboy Railroad Historic Districts Study, Volume 1 and Volume 2* identified appropriate mitigation strategies and additional opportunities which were considered by the project sponsors in developing a mitigation program to offset the adverse effects of the proposed construction; and

**WHEREAS**, consultation for the Southern New Jersey Light Rail Transit System (SNJLRTS) has involved extensively researched consideration of appropriate standard

design features for new construction within the Camden and Amboy Railroad (Main Line) Historic District; and

**WHEREAS;** it is desirable to utilize a single design vocabulary for all projects within the historic district; and

**WHEREAS,** two public meetings were held on February 8, 2001 and June 27, 2001 in the City of South Amboy to describe the project and the environmental studies which had been conducted to the public, and to allow the public to ask questions and provide comments on the work conducted to date; and

**WHEREAS,** questions and comments at that meeting related primarily to traffic engineering issues; and

**WHEREAS,** the FHWA, SHPO, NJDOT and City of South Amboy, have consulted to develop a plan to mitigate the adverse effects; and

**WHEREAS,** NJDOT on behalf of the FHWA invited the City of South Amboy to concur in the MOA and they have agreed; and

**WHEREAS,** the NJDOT has participated in the consultation, has been invited to concur in the MOA, and has agreed; and

**WHEREAS,** the Advisory Council was notified of the adverse effect [March 21, 2002] and has declined to participate in the consultation process;

**NOW, THEREFORE,** the FHWA and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

### **STIPULATIONS**

The FHWA will ensure that the following measures are carried out:

The City of South Amboy, using the services of a consultant and prior to the initiation of construction, shall implement the following stipulations.

## **I. Archeological Monitoring**

- A. Preconstruction Notice – The City of South Amboy shall ensure that all construction inspectors and contractors are informed about the need for identification, evaluation and protection of historic properties pursuant to Section 106 of the National Historic Preservation Act; and that they are informed of all stipulations in this MOA which may restrict or constrain construction activities. The City shall develop an archeological monitoring/data recovery procedure, which provides for notification and coordination with NJDOT, SHPO and FHWA should historic resources and/or features be uncovered during construction. The procedure shall provide for immediate cessation of construction activities in any areas where undocumented remains are uncovered, notification of qualified archeologists to collect initial information about the resources identified and convene a consultation meeting; and implementation of any data collection/mitigation procedures which might, through consultation, be determined appropriate. FHWA, NJDOT and SHPO staff shall be available for on-site consultation in no more than two days of notification of the need for consultation. The procedure shall be submitted to the SHPO, NJDOT and FHWA for review and comment prior to advertising the construction contract; the revised procedure shall be included in the construction bid package and shall be an item of discussion during the preconstruction conference. SHPO staff will be invited to participate in the preconstruction conference.
- B. Monitoring – A professionally qualified archeological monitor shall be present on-site and shall inspect all excavations/earthmoving operations that may result in subsurface disturbance. Two types of monitoring may be anticipated, and provisions for both types shall be included in the procedures developed as Task A above.
1. Observational monitoring - which entails visual examination of work in progress and the rapid documentation of features or artifacts through photography, survey, and written notes.
  2. Documentary monitoring – requires discontinuation of construction related work for a longer period of time to investigate and document [sufficiently to meet any requirements for archeological mitigation] archeological features which are significant or potentially significant.

## **II. Photographic Documentation**

Documentary photos of the overall rail site and specific perspectives that illustrate the surviving catenary system, remaining pier/wharf pilings, and former locomotive shop area in relation to the surviving coal thawing sheds will be taken for inclusion in the final report.

## **III. Field Verification of Pier/Wharf Locations**

The City of South Amboy will ensure that field verification of the locations of the various piers and wharves in the area of direct impact, as documented in historic maps, will be undertaken. The locations of key pilings will be recorded using global

positioning system (GPS) technology, and ancillary pilings will be mapped using relational techniques. Archival photographs of the pilings will be taken to supplement the mapping effort. Visible hardware will be photographed only if it has the ability to assist in the dating or other interpretation of the pier/wharf features. No artifacts will be retained. The goal of this effort is to verify the locations and construction sequences of the various pier/wharf features that appear on historic maps. Such information will contribute to an understanding of how the rail facility developed and functioned.

#### **IV. Duplication of Documentary Records**

Research for the project has been extensive and has been conducted at the following repositories:

New Jersey State Library

New Jersey State Archives

National Archives

Historical Society of Pennsylvania

Hagley Museum and Library

NJDEP- Bureau of Tidelands Management

Pennsylvania Railroad Museum

Historical Collections of the Great Lakes, Bowling Green State University, Jerome Library

Copies of primary documentation and other records collected from the above listed repositories will be provided to no more than five local or regional repositories [including historical and railroad societies]. Other documents identified during any subsequent research will be evaluated to determine if copies can be made for these same repositories within the project budget. A list of potential recipients for these copies [which may include but not be limited to the NJ Archives, the South Amboy and/or Middlesex County Historical Societies, the Camden and Amboy and/or Pennsylvania Railroad Historical Societies, and the Rutgers University Special Collections Library] will be submitted to the SHPO for comment. All copies will be duplicated on archivally stable paper.

#### **V. Design Considerations - Site Design**

A Landscape Architect with a demonstrated interest in historic preservation will be added to the project design team to assist with the development of the site. The goal of this individual's involvement will be to ensure that, to the degree possible, all pertinent features, of the facility will be compatible with the historic architecture and engineering characteristics, features, and setting of the Camden and Amboy Railroad (Main Line) Historic District. The design shall be responsive to the standards, guidelines, and recommended approaches for new construction affecting historic properties as set forth in the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Historic compatibility considerations shall include design, location, size, scale, materials, color, workmanship, and visual impacts. Design features such as fencing, lighting, handrails, signage, etc. selected for the SNJLRTS

shall be considered for use in the current project. Specific tasks to be accomplished with the involvement of the Landscape Architect include

- A. Developing a site plan which utilizes and interprets historic railroad artifacts [including the stone sleepers currently located in the shoreline area adjacent to the site of the Explosives Pier], and which minimizes the visual impacts of the new construction on the remaining landscape features of the historic rail facility.
- B. Developing a “gateway” to the intermodal transportation facility that preserves two types of catenary structures--a Portal Bridge [C15a/b] and one or more Bracket Arm Bridge Structures [C20 or C21].
- C. Developing on-site interpretive materials or displays that are consistent with other such features currently being developed by NJ Transit and NJDOT for use within the Camden & Amboy Railroad (Main Line) Historic District, and responsive to the quality of the available historical materials. An emphasis will be placed on in-situ interpretation of artifacts and landscape features when feasible.

The overall site plan and design details for the gateway; and specifications [including plans as needed] for the removal of the railroad features, evaluation as necessary, rehabilitation, reuse, and re-erection will be submitted to the SHPO for review as soon as possible, but at least prior to advertisement, to determine if proposed designs are compatible with historic properties. Any design compatibility issues raised by the SHPO will be addressed and resolved through consultation among the City, SHPO, NJDOT, and FHWA prior to the advertisement of the job and/or prior to the initiation of any actions which may compromise the integrity of the railroad features. Any railroad artifacts that will not be used in the gateway or as landscape features will be retained, stored, and offered to appropriate state, county, municipal, local or other organizations capable of accepting, preserving, and interpreting the artifact(s). Such donations will be subject to preservation agreements developed in consultation with the SHPO. Any artifacts not re-used or donated will be photographically documented in their original setting prior to removal.

## **VI. Reporting**

The City shall ensure that appropriate reporting of the research conducted for the project is completed. The following will be accomplished:

- A. Additional Research – Historical research completed to date has been sufficient to satisfy the identification and assessment components of the Section 106 process. Additional research will be conducted as partial mitigation for the adverse effects to the Camden and Amboy Railroad (Main Line) Historic District. This research will address materials in the collections of the Pennsylvania State Archives, Hagley Museum, New Jersey State Library/Archives, New Jersey Historical Society and other repositories that may be identified as the result of the review of *The Camden and Amboy Railroad and*

*Transportation Company, A Bibliography [1947]*. Research will be undertaken in order to collect information from primary and secondary sources pertinent to the understanding of the development of the South Amboy rail facility in the years between 1831 and 1911. This research will place the facility within regional economic and transportation contexts. The region is roughly defined as the area between the Ports of New York and New Jersey to the north and Philadelphia to the south. No more than 20 person-days shall be expended on this effort.

- B. Technical Report - The results of all historical and archeological research conducted for this project will be presented in an analytical and narrative report, which conforms to professional reporting standards. The narrative section of the report will place the facility in the overall context of the Camden and Amboy and Pennsylvania Railroad operations, and also present the specific history and development of the South Amboy facilities. The report shall specifically address the development and functioning of the rail-maritime connection, and the evolution of the physical configuration and operations of the South Amboy facility. Photographic documentation of the various site elements as compiled for interim survey/management reports and as described in Task II above will also be included in the technical report.
- C. Artifact Curation - The City shall ensure that all artifacts recovered during fieldwork are curated at an appropriate facility. Artifacts not reused in the context of the current project will be offered initially to the NJ State Museum, secondly to the NJ Transportation Museum [currently under development] and lastly to an appropriate local or railroad focused facility.
- D. Popular report – A non-technical report of investigations will be prepared which describes the history of the rail facility and places it within the larger context of the Camden and Amboy and Pennsylvania rail systems.
- E. Public Presentation – The Consultant will make a public presentation in South Amboy to local residents, groups, and individuals. Organizations with an interest in local railroading history may also be invited to the presentation. The presentation will be non-technical in nature, but will provide synthetic information about the site that has been derived from the current research. Videotape of the presentation will be made. Three copies will be provided to NJDOT for distribution to the SHPO and FHWA; one copy will be retained by the City for use by constituents and other interested individuals/groups.

## **ADMINISTRATIVE CONDITIONS**

### **I. Professional Qualifications**

The City and NJDOT, on behalf of FHWA, will ensure that all work is carried out by/under the direct supervision of a person or persons meeting at a minimum the *Secretary of the Interior's Professional Qualifications Standards [48 FR 44738-44739]*.

## II. Dispute Resolutions

At any time during the implementation of the measures stipulated in this MOA, should an objection to any such measure or its manner of implementation be raised, FHWA will notify all signatories to the agreement, take the objection into account, and consult as needed to resolve the objection.

Disputes regarding the completion of the terms of this agreement as necessary shall be resolved by the signatories. If the signatories cannot agree regarding a dispute, the FHWA shall then initiate appropriate actions in accordance with the provisions of 36 CFR 800.6(b) and 800.7 as appropriate.

Modification, amendment, or termination of this agreement as necessary shall be accomplished by the signatories in the same manner as the original agreement.

## III. Design Changes

If any changes to the Intermodal Ferry Transportation Center project design occur which have the potential to affect historic properties, the City of South Amboy shall notify the NJDOT. NJDOT, with the assistance of the FHWA, shall consult with the SHPO in accordance with the provisions of 36 CFR Part 800. For any such changes, the City shall submit a plan sheet or design sketch showing the proposed change; a written description of why the change is needed; and a description of alternatives considered to achieve the same goals. If formal consultation is initiated the SHPO shall provide written comments to the City, FHWA, NJDOT [Bureau of Environmental Services and Local Aid] within five working days of receipt of documents. Review comments shall evaluate the change for its potential to affect historic properties and its conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

## IV. Project Completion

- A. **Project Completion** - All work required to complete the tasks enumerated in Stipulations I through V will be completed prior to the initiation of construction. Work required as part of Stipulation VI will be accomplished according to a schedule developed during negotiations for the cultural resources work.
- B. **Documentation of Satisfaction of Stipulations** - The City shall submit a short narrative report with appropriate illustrations to all consulting parties demonstrating satisfaction of any mitigation requirements which will not be included in the archeological reports within 90 days of completion of construction or according to an alternate schedule negotiated immediately after the pre-construction meeting.

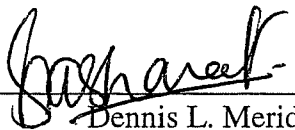


**V. Review of Implementation**

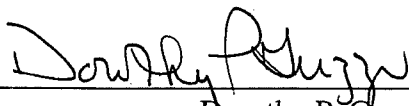
This agreement shall become null and void if construction is not initiated within five years from the date of execution unless the signatories agree in writing to an extension. If, after five years without action the FHWA chooses to continue with the undertaking, it shall re-initiate its review in accordance with the provisions of 36 CFR Part 800.

Execution of this Memorandum of Agreement and implementation of its terms evidence that FHWA has afforded the Council an opportunity to comment on the Intermodal Ferry Transportation Center project and its effects on historic properties, and that the FHWA has taken in to account the effects of the project on historic properties.

FEDERAL HIGHWAY ADMINISTRATION


By:  Date: 7/25/03  
Dennis L. Merida, P.E.  
Division Administrator, NJ Division Office

NEW JERSEY STATE HISTORIC PRESERVATION OFFICE

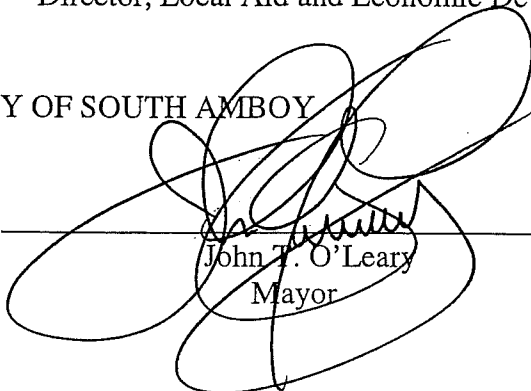
By:  Date: 7/23/03  
Dorothy P. Guzzo  
Deputy State Historic Preservation Officer

**Concur:**

NEW JERSEY STATE DEPARTMENT OF TRANSPORTATION

By:  Date: 7-23-03  
David A. Kuhn, P.E.  
Director, Local Aid and Economic Development

CITY OF SOUTH AMBOY

By:  Date: 7/21/03  
John T. O'Leary  
Mayor

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**APPENDIX D**

**WAVE STUDY**

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**Wave Climate Study for the South Amboy Regional Intermodal  
Transportation Center**

**O. Nwogu and M. Bruno**

Davidson Laboratory  
Stevens Institute of Technology  
April 13, 2001



Michael S. Bruno, Director  
Davidson Laboratory  
Stevens Institute of Technology

## **INTRODUCTION**

The City of South Amboy is proposing building a ferry terminal as part of an intermodal (rail/bus/ferry) transportation center. The proposed site for the ferry terminal is at intersection of Raritan river and Arthur Van Kill channel, at the western edge of Raritan bay. The area is subject to waves generated locally by winds within the Lower New York Bay as well as waves that enter the bay from the Atlantic Ocean between Sandy Hook and Rockaway Point.

An important consideration in the design of the ferry terminal is an assessment of wave climate at the project site. The ability of the ferry to effectively load and offload passengers depends on the level of the vessel motions, which in turn depends on the wave conditions. The wave climate is also required for the design of the breakwater to protect the terminal. Davidson Laboratory of Stevens Institute of Technology were contracted by T&M Associates to provide information on the wave climate at the proposed ferry site and assist in the design of a breakwater.

This report documents some of the preliminary work to date including:

1. Analysis of existing wave and meteorological data for the study region.
2. Prediction of the local wind-generated wave climate in Raritan Bay.
3. Evaluation of the wave conditions at the ferry terminal location for different breakwater lengths and transmission characteristics.

## **AVAILABLE WAVE/WIND DATA SOURCES**

### *NOAA Buoy 44025*

The National Oceanographic and Atmospheric Administration (NOAA) operates a directional wave buoy (Station 44025) at 40.25° N 73.17° W, approximately 33 nautical miles east of Long Branch, NJ in a water depth of 130 ft. The buoy provides information on significant wave height, peak period, wave direction and wind speed at 5m (15 ft) above the sea surface. The buoy has been in operation since 1975.

### *NOAA Ambrose Light Station*

NOAA also collects wind and wave information from the Ambrose Light Tower, which is located at the entrance to New York Harbor approximately 5.6 nautical miles east of Sandy Hook, NJ. The station is located at 40.46° N 73.83° W and its identification number is ALS6N6. Data available from Ambrose Light Station include wind speed and direction, and wave height and period, but not wave direction. The wind is measured over open water making it more suitable for wave hindcast studies, in contrast to wind data available at nearby airports (Kennedy, Newark).

## AVAILABLE TIDAL/STORM SURGE DATA SOURCES

The United States Geological Survey (USGS) operates a water level gauge at Raritan River by South Amboy close to the project site. The station identifier is 01406710.

NOAA also operates a tidal gauge (Station No. 8531680) on Atlantic Ocean side of Sandy Hook. The station is located at 40.47° N 74.01° W.

## SUMMARY OF METEOROLOGICAL/OCEANOGRAPHIC DATA

### *Wind/Wave Data*

Since there are no wave measurement stations within Raritan bay, the local wind-generated wave climate at the ferry site was hindcast from long-term wind observations at Ambrose Light Station. The wind gauge at Ambrose station is located at an elevation of 49.1m above the mean sea level (MSL). The wind-wave hindcast model requires the wind speed at elevation of 10m. The recorded wind speeds at the 49.1m elevation were adjusted to the 10m elevation using the “1/7 power law” relationship:

$$U_{10} = U_z \left( \frac{10}{z} \right)^{1/7} = 0.80 U_{49.1}$$

The Ambrose station wind data were analyzed over a ten-year time period from 1990 to 1999. The analysis focused on winds approaching from the ESE to ENE sector since these are the only winds that will generate any significant waves at the ferry terminal location due to the available fetch. The percentage occurrences of average wind speed at 10m elevation for different direction bands are presented in Table 1.

Table 1. Frequency of Occurrence of Wind Speed for different Direction Bands – Ambrose Light Station (1990-99)

Wind Speed (m/s)	Wind Direction (deg azimuth)					
	< 52.5	52.5 – 67.5	67.5 – 82.5	82.5 – 97.5	97.5 – 112.5	>112.5
< 5	4.51	1.13	1.11	1.13	1.21	28.88
5 - 7	3.08	0.74	0.73	0.68	0.60	18.82
7 - 9	2.03	0.59	0.52	0.46	0.32	14.54
9 – 11	1.02	0.30	0.27	0.22	0.18	8.74
11 – 13	0.44	0.12	0.14	0.12	0.09	4.10
13 – 15	0.19	0.07	0.08	0.04	0.03	1.77
> 15	0.09	0.09	0.08	0.04	0.02	0.68

Winds from 52.5 to 112.5 degree azimuth occur 11.1% of the time with a mean speed of 6.1 m/s (12 knots). The largest recorded average wind speed was 28.6 m/s (56 knots).

A number of extreme storm events also occurred during the 1990 to 1999 analysis time frame including the October '91, December '92 and March '93 storms. The significant wave height,  $H_s$ , peak period,  $T_p$ , and wind speed,  $U$ , recorded at Ambrose Station, and water level information from Sandy Hook are summarized in Table 2.

Table 2. Summary of Extreme Storm Events

Date	$H_s$ (m)	$T_p$ (s)	$U$ (m/s)	WL in m above MLLW
10/31/91 08:00	2.9	12.5	13.5	2.7
12/11/92 17:00	7.3	12.5	20.6	3.0
3/13/93 21:00	5.7	11.1	25.3	2.1

Our analysis indicates that the offshore wave conditions measured during the December, 1992 storm represent the 50-year storm conditions – that is, the wave heights observed during this storm have an expected return period of 50 years.

### ***Tidal/Storm Surge Data***

The tidal regime in Lower New York Bay is semi-diurnal with a mean range of 5 ft at South Amboy. Data from a 1960 survey the Army Corps of Engineers indicates a maximum-recorded storm surge level of 9.5 ft (2.9m) above MSL during a November 1950 storm event. The design storm surge levels are 10.5 ft above MSL for a 50-year storm event and 11.5 ft above MSL for a 100-year storm event.

### **WAVE MODELING**

The primary objectives of the wave modeling study were:

1. to ensure that the wave heights are below acceptable levels during normal ferry loading/offloading operations.
2. provide extreme wave conditions for the design of a fixed or floating breakwater.

The design operational condition is normally provided by the ferry operator and should typically occur no more than 0.5% of the time, or equivalently 10 times in a year assuming a storm duration of 4 hours. Small boat marinas generally use a design wave height guideline of 1 ft (0.3m) but this number might be less for ferry operations.

The second requirement is that the breakwater and/or mooring system should be designed to withstand an extreme storm event that occurs once during the design return period. For a return period of 50 years, the frequency of occurrence is 0.001% assuming a storm duration of 4 hours.

Two wave models were employed for the wave climate study. A spectral wind-wave model was run at a regional scale level over a coarse grid to predict the wave conditions near the proposed ferry terminal site. The results from the regional wave model were then used as boundary conditions for a higher-resolution wave transformation model to predict the wave conditions at the ferry terminal site for different breakwater lengths and transmission characteristics.

### ***Regional Wave Model***

#### *Description of Wind-Wave Model*

The wave model selected for the project is STWAVE, developed at the U.S. Army Corps of Engineers. This is a spectral model that includes the effect of local wave generation due to wind; shoaling and refraction due to bottom topography; energy dissipation due to wave breaking and bottom friction; cross-spectral energy transfer due to nonlinear wave-wave interactions; and wave-current interaction.

STWAVE is a spectral wind-wave model based on wave action conservation conserved between adjacent rays. It is ideally suited to simulating wave propagation in open water where the processes of wind input, shoaling and refraction are dominant. STWAVE is also able to describe the effects of wave-current interaction and depth-induced breaking. STWAVE is a phase-averaged model, i.e. it assumes that changes in phase-averaged wave properties vary slowly over distances of the order of a wavelength. The grid spacing can thus be of the order of a wavelength. This allows the efficient computation of wave propagation over large areas in open water. Due to the phase-averaging procedure, however, STWAVE cannot accurately simulate the reflection/diffraction of waves near coastal structures where rapid changes can occur over distances of the order of a wavelength.

#### *Computational Grid*

The bathymetry for the regional wind-wave model simulations was generated using data from NOAA's National Geophysical Data Center (NGDC) coastal relief model. The grid covers a 29.5 km by 22.5 km region extending from 74°17'W to 73°56'W and 40°24'N to 40°36'N, at a resolution of 100m as shown in Figure 2. The grid extends slightly east of Sandy Hook in order to capture waves arriving from the Atlantic Ocean, a critical component of the wave climate during extreme storm events.

The initial part of the wave climate study focused on predicting waves generated by local winds in the Lower New York Bay. The model was run for 20 conditions representing the mid-intervals of the bands in Table 1, i.e. for wind speeds,  $U = 6, 8, 10, 12, 14$  m/s and wind directions,  $\theta = 60^\circ, 75^\circ, 90^\circ, \text{ and } 105^\circ$ . All runs were carried out at mean sea level. Figures 3 and 4 show a 2-D map of the predicted significant wave height distribution over the lower bay for  $U = 8\text{m/s}, \theta = 90^\circ$  and  $U = 12\text{m/s}, \theta = 60^\circ$  respectively. The predicted significant wave heights and periods at a grid point close to the project site (UTM coordinates 561816E, 4482701N) are summarized in Tables 3 and 4. The wave

heights were largest for winds blowing from the East ( $90^\circ$ ) with  $H_s = 0.52\text{m}$  (1.7ft) and  $T_p = 4.6\text{s}$  for  $U = 14\text{m/s}$  (28 knots).

Table 3. Predicted Significant Wave Height (m) versus Wind Speed and Direction

Wind Speed (m/s)	Wind Direction (deg azimuth)			
	$60^\circ$	$75^\circ$	$90^\circ$	$105^\circ$
6	0.13	0.21	0.27	0.25
8	0.18	0.28	0.35	0.34
10	0.22	0.33	0.41	0.40
12	0.27	0.38	0.47	0.46
14	0.31	0.44	0.52	0.51

Table 4. Predicted Peak Wave Period (s) versus Wind Speed and Direction

U (m/s)	$60^\circ$	$75^\circ$	$90^\circ$	$105^\circ$
6	3.5	3.5	3.5	3.5
8	3.9	3.8	3.8	3.8
10	4.2	4.1	4.1	4.1
12	4.5	4.4	4.4	4.4
14	4.7	4.7	4.6	4.7

STWAVE was also run for the three extreme storm events listed in Table 2 (Oct. '91, Dec. '92, March '92) and the maximum-recorded wind speed of  $28\text{m/s}$  at a storm surge level of  $+3\text{m}$  (10ft). The predicted significant wave heights and peak periods at the grid point close to the ferry terminal site (UTM coordinates 561816E, 4482701N) are summarized in Table 5.

Table 5. Summary of Predicted Wave Conditions near Ferry Terminal Site for Extreme Storm Events

Test Condition	$H_s$ (m)	$T_p$ (s)
October '91	0.35	12.5
December '92	0.60	12.4
March '93	0.57	11.0
$U = 28\text{m/s}$ , $WL = +3\text{m}$	1.63	6.2

For the December '92 storm event with  $H_s = 7.3\text{m}$ ,  $T_p = 12.5\text{s}$ ,  $U = 20\text{ m/s}$ , the predicted wave conditions near the project site were  $H_s = 0.6\text{m}$  and  $T_p = 12.4\text{s}$ . Wave refraction and



breaking over shallow areas in the bay resulted in much lower wave heights at the ferry site. The wind-alone conditions at an elevated water level of +3m resulted in much larger wave heights near the site with a predicted  $H_s$  of 1.63m (5.3 ft).

### *Near-Field Wave Model*

A high-resolution wave model was used to simulate the propagation and transformation of waves near the ferry terminal site due to processes such as refraction, diffraction, and reflection, and investigate the effect of different breakwater lengths on the wave climate at the ferry terminal.

#### *Description of Near-Field Model*

The wave transformation model used for the near-field study is based on a time-domain solution of Boussinesq equations (Nwogu, 1993). The equations represent the depth-integrated equations for the conservation of mass and momentum for weakly nonlinear waves propagating in intermediate and shallow water depths. The model can simulate most of the wave transformation phenomena of interest in coastal regions and harbors including shoaling, refraction, diffraction, reflection, nonlinear wave-wave interactions, wave breaking and wave-induced currents.

The numerical model solves the governing equations expressed in terms of the water surface elevation and two components of the horizontal velocity at a specified depth below the still water level using a time-domain, finite difference method. The area of interest is discretized using a rectangular grid with the equation variables defined at every grid point in a staggered manner. Along offshore or internal generation boundaries, time histories of velocity fluxes corresponding to an incident storm condition are input. The incident wave conditions may be periodic or non-periodic, unidirectional or multidirectional.

Damping layers are placed around the perimeter of the computational domain to absorb outgoing waves. Damping and porosity layers are also used to model the reflection and transmission characteristics of breakwaters and harbor structures. The damping and porosity characteristics are initially calibrated in a one-dimensional numerical flume to match the desired reflection and transmission characteristics of the breakwaters and harbor structures.

Outputs of the model are the significant wave height over the entire computational domain, and time histories of the water surface elevation and two components of the horizontal velocity at points of interest in the computational domain.

#### *Computational Grid*

The bathymetry for the near-field wave model study was generated from hydrographic survey data provided by Rogers Surveying of New York. The soundings data were triangulated and interpolated onto a rectangular grid with a uniform grid spacing of 5ft (1.524m). The grid covered a 2000 ft by 1700 ft area bounded by NJ State Planar Coordinates 553800 to 555800 ft Easting and 603100 to 604800 ft Northing. The survey

data was relative to MLW, which is 2.5 ft below the MSL so a minimum water depth of 3 ft at MSL was adopted. Figure 5 shows a 2-D map of the bathymetry used for the near-field wave simulations.

### *Test Conditions*

The design operational condition requires that waves with an exceedance frequency of 0.5% should not induce significant wave heights greater than 0.3m (1ft) at the ferry terminal. From Table 2, winds from 52.5 to 112.5 degree azimuth with speeds greater 13m/s occur 0.45% of the time. The corresponding wave conditions near the terminal site are given by Tables 3 and 4 as  $H_s = 0.52\text{m}$  (1.7ft) and  $T_p = 4.6\text{s}$ .

T and M Associates provided the basic design layout of the ferry terminal. The following three alternatives were investigated with the numerical model:

1. Without any breakwater
2. With a bottom-founded impermeable breakwater with lengths of 700 ft, 780 ft and 850 ft.
3. With a floating breakwater with 50% transmission and lengths of 780 ft and 850 ft.

For the fixed bottom-founded breakwater, the reflection coefficient was assumed to be 20% on the seaward side. The floating breakwater is assumed to have a transmission coefficient of 50%. The reflection and transmission characteristics of the breakwaters were initially calibrated in a 1-D flume and one would usually slight differences in a 2-D situation with oblique incident wave angles.

Numerical simulations were carried out for the operational wave conditions. The incident sea states were assumed to be irregular and unidirectional for all the runs. Time histories of the velocity fluxes along the offshore boundaries were synthesized from target JONSWAP spectra using the random phase method. A time step size of 0.1 s ( $\Delta t$ ) were used for the simulations with a grid spacing of 1.524 m ( $\Delta x$  and  $\Delta y$ ).

### *Model Results*

A three-dimensional view of the water surface elevation near the ferry terminal site for the test condition without any breakwater is shown in Figure 6. The corresponding 2-D map of the normalized wave height distribution is plotted in Figure 7. It can be seen that the waves refract away from the deeper South Amboy channel towards the ferry site. The predicted significant wave heights at two output locations where the ferries would be docked are  $H_s = 2.4$  ft at Gauge #1 (554513, 603828) and  $H_s = 1.2$  ft at Gauge #2 (554464,603848). The wave height pattern varies spatially near the site with the waves amplified at Gauge #1. 3-D views of the water surface elevation near the ferry terminal site for the test conditions with a 780-ft long fixed and floating breakwaters are shown in Figures 8 and 9. 2-D maps of the normalized wave height distribution are for the breakwater test cases are presented in Figure 10 to 14 while the predicted significant wave heights at Gauges #1 and #2 are summarized in Table 6 for all the test conditions.

Table 6. Summary of Predicted Wave Conditions at the Ferry Terminal Site for Operational Wave Conditions

Test Condition	$H_s$ (ft)	
	Gauge #1	Gauge #2
Without Breakwater	2.4	1.2
With 700ft Fixed Breakwater	1.1	1.4
With 780ft Fixed Breakwater	0.5	0.8
With 850ft Fixed Breakwater	0.3	0.4
With 780ft Floating Breakwater	1.2	0.9
With 850ft Floating Breakwater	1.5	0.8

From Table 6, it can be seen that for the design operational wave condition ( $H_s = 1.7\text{ft}$ ,  $T_p = 4.6\text{s}$ ), we require at least a 780-ft long bottom-connected breakwater to reduce the wave heights to less than 1-ft at the ferry terminal. The results for the floating breakwater with a 50% transmission coefficient are somewhat mixed. Due to the nature of the bathymetry in the sheltered area behind the breakwater, the wave heights might be larger than expected height of 0.85 ft ( $0.5 \times 1.7\text{ft}$ ) at some locations.

## EVALUATION OF BREAKWATER ALTERNATIVES

### *Rubble-Mound Breakwater*

The water depth along breakwater location varies from 18 ft to 12 ft below the mean sea level. To prevent wave overtopping during a 50-year storm event, the crest elevation of the breakwater should be at least 15 ft above MSL (10ft storm surge + 2.5 ft tide + 2.5 ft wave runoff). The height of the breakwater at the deepest location would be 33 ft.

The minimum side slope of rubble-mound breakwaters depends on the angle of repose of the armor stones. Steeper slopes are subject to landslide-type failures while flatter slopes are too expensive to construct. For most practical breakwaters, the slopes range from 1V:1.5H to 1V:2H. The minimum crest width depends on a number of factors such as rock size but has to be at least three armor units wide. Assuming a crest width of 10 ft and side slopes of 1V:1.5H, the bottom footprint of the breakwater would be 110 ft at the deepest location.

Although the rubblemound breakwater would be effective in minimizing wave action at the ferry terminal location, its major drawbacks are a large bottom footprint and the reduced flushing in the area enclosed by the breakwater. One would also have to make sure that the soil conditions are suitable to support such a large structure.

### ***Sheet-Pile Structure***

A double wall sheet-pile breakwater with sand and/or rock fill could alternatively be used to protect the ferry terminal. Its bottom footprint would be much less than that of a rubblemound breakwater. Its major disadvantages are the reduced flushing in the area enclosed by the breakwater and wave reflection on the seaward side of the breakwater. The reflected waves could create hazardous conditions in the navigation channel adjacent to the proposed ferry terminal site.

### ***Floating Breakwater***

Floating breakwaters are generally less expensive than fixed bottom-connected structures. They allow for better circulation, which improves the water quality in the area behind the breakwater. Their performance in terms of the transmitted wave height depends on the ratio of the breakwater width to wavelength. Most of them are generally effective (transmission coefficient less than 50%) for breakwater widths greater than one-quarter of the wavelength. For a wave with a period of 4.5s in 18 ft of water, this would require a minimum breakwater width of 20 ft. The major problem with the floating breakwaters is that they allow close to 100 % transmission for the long waves ( $T > 6s$ ) associated with extreme storm events. The mooring systems for the floating breakwater and ferries have to be designed to withstand such extreme storm events.

### **REFERENCES**

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- Smith, J.M., Resio, D.T. and Zundel, A.K. 1999. STWAVE: Steady-State Spectral Wave Model. *U.S. Army Waterways Experiment Station Technical Report CHL-99-1*, Vicksburg, MS.

Raritan Bay Bathymetry for Wind-Wave Simulations

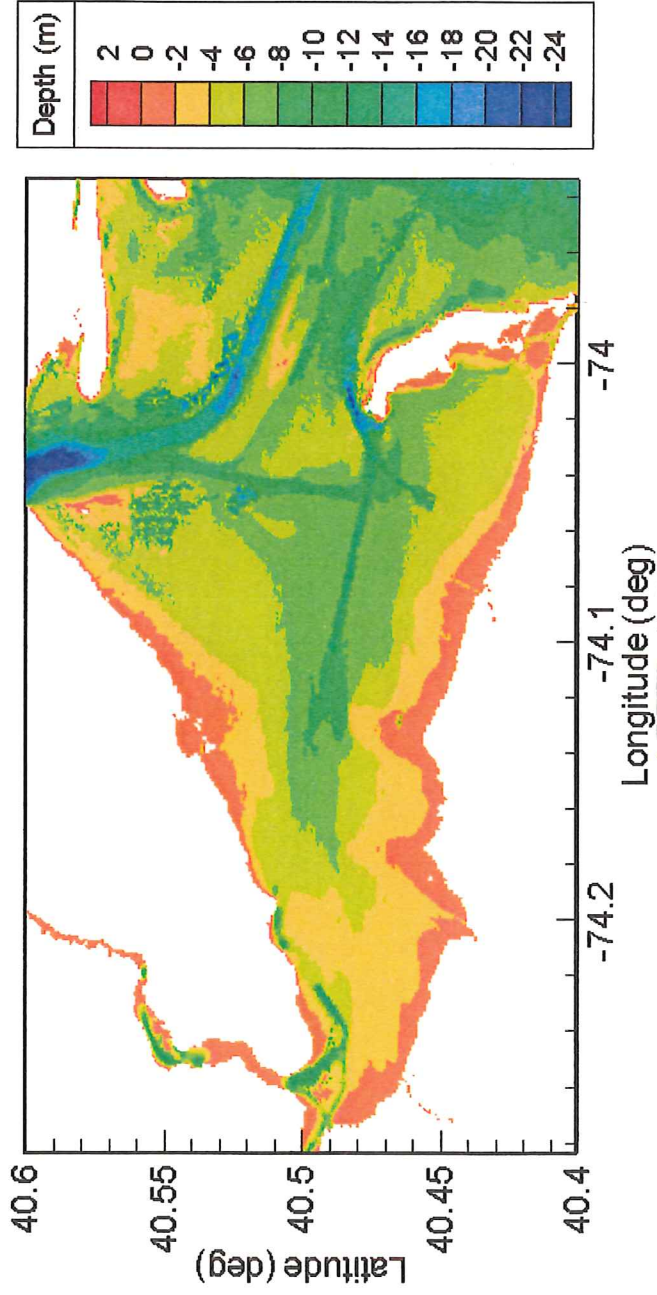


Fig. 2

Predicted Wave Height Distribution for Local Wind-Generated  
Sea State ( $U = 8\text{m/s}$ ,  $\text{Dir} = 90^\circ$ ,  $\text{WL} = 0\text{m}$ )

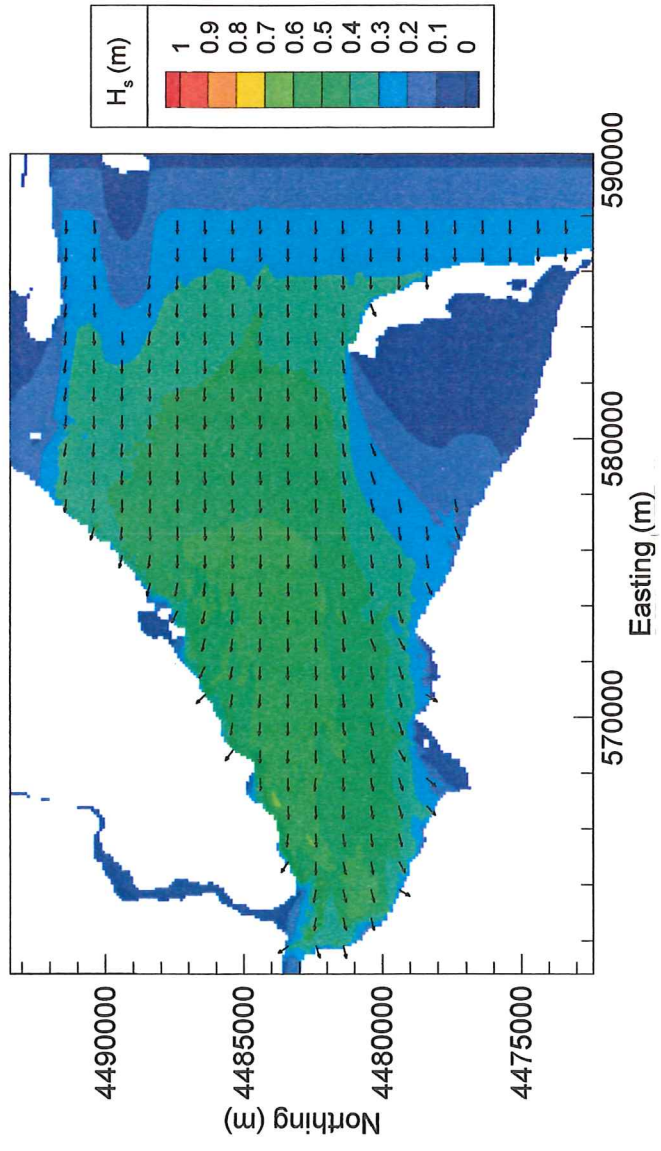


Fig. 3

Predicted Wave Height Distribution for Local Wind-Generated  
Sea State ( $U = 12\text{m/s}$ ,  $\text{Dir} = 60^\circ$ ,  $\text{WL} = 0\text{m}$ )

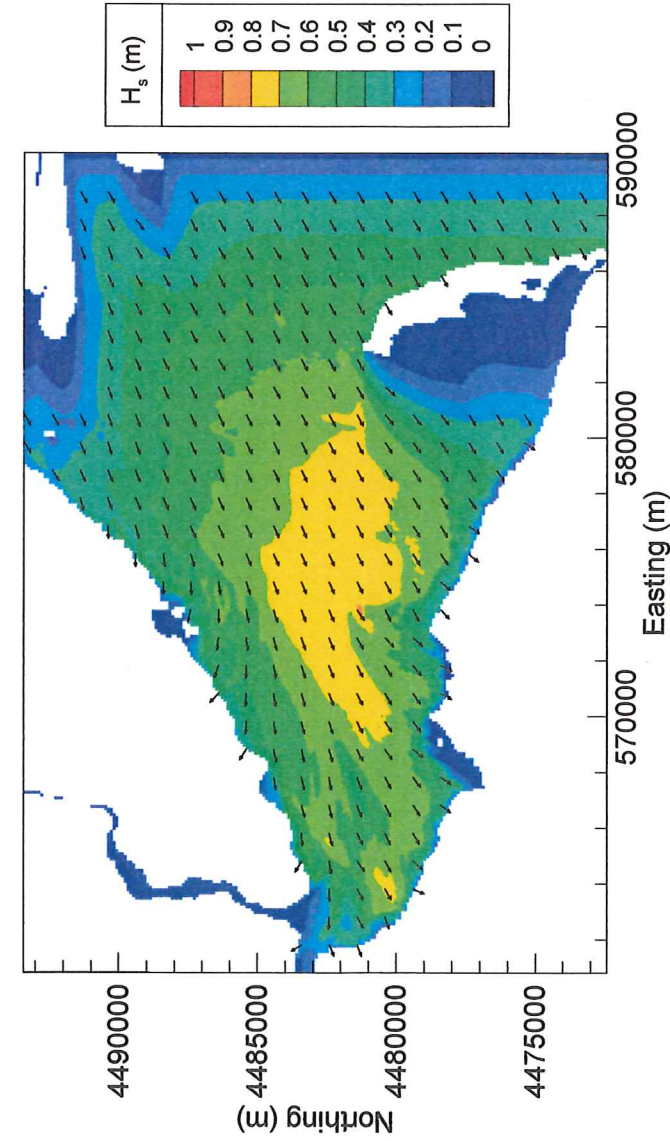


Fig. 4

Bathymetry for Near-Field Wave Transformation Study

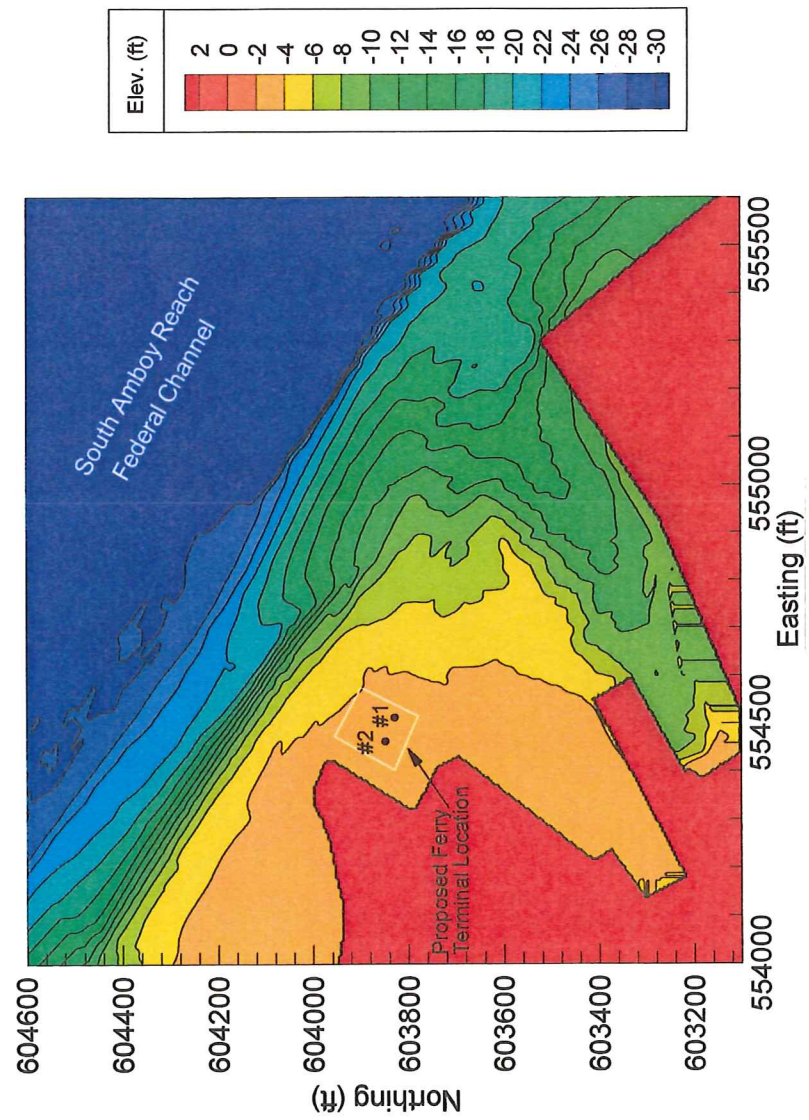


Fig. 5



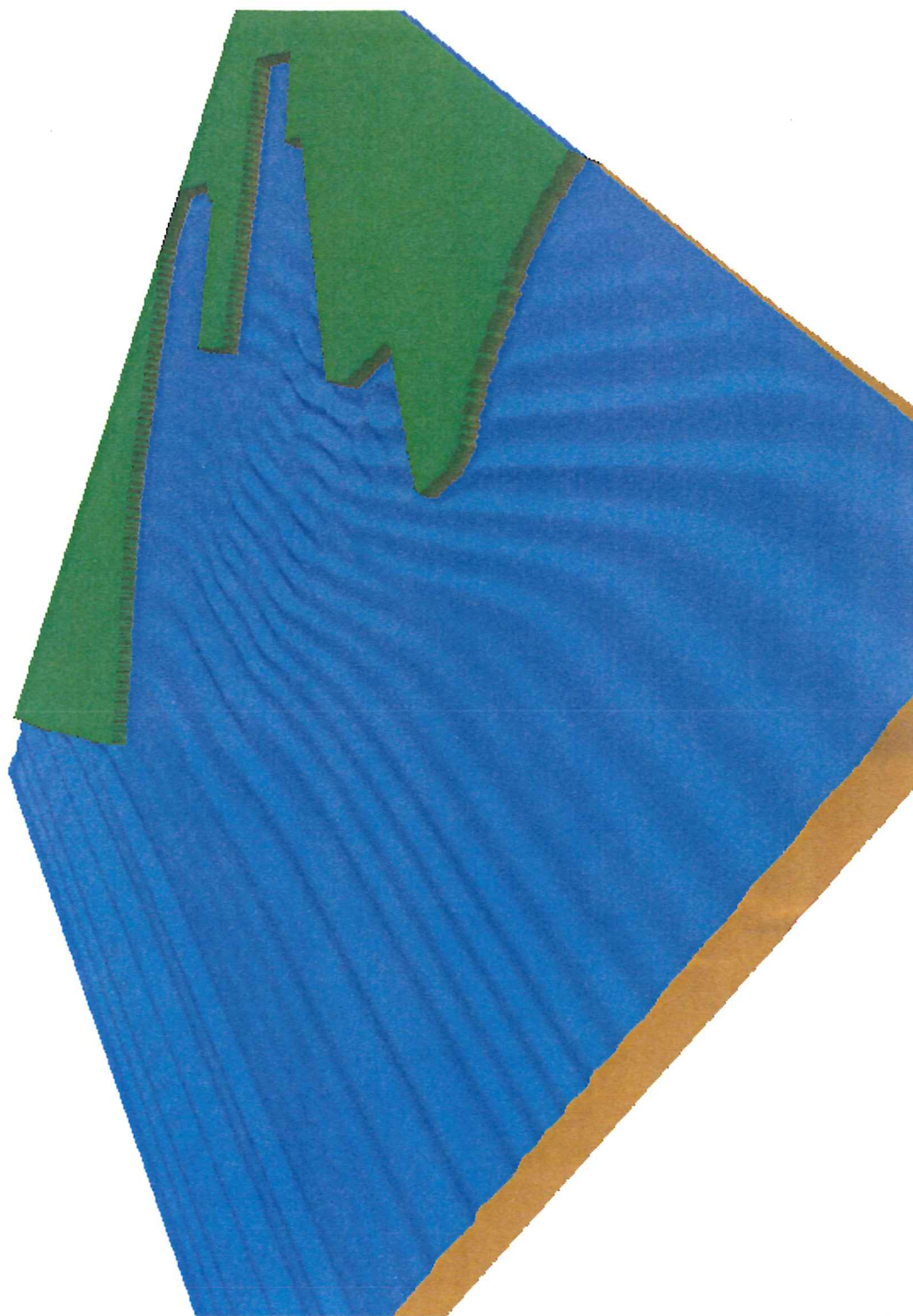


Fig. 6

Normalized Wave Height Distribution for Test Condition  
without Breakwater ( $T_p = 4.7s$ , Dir= East)

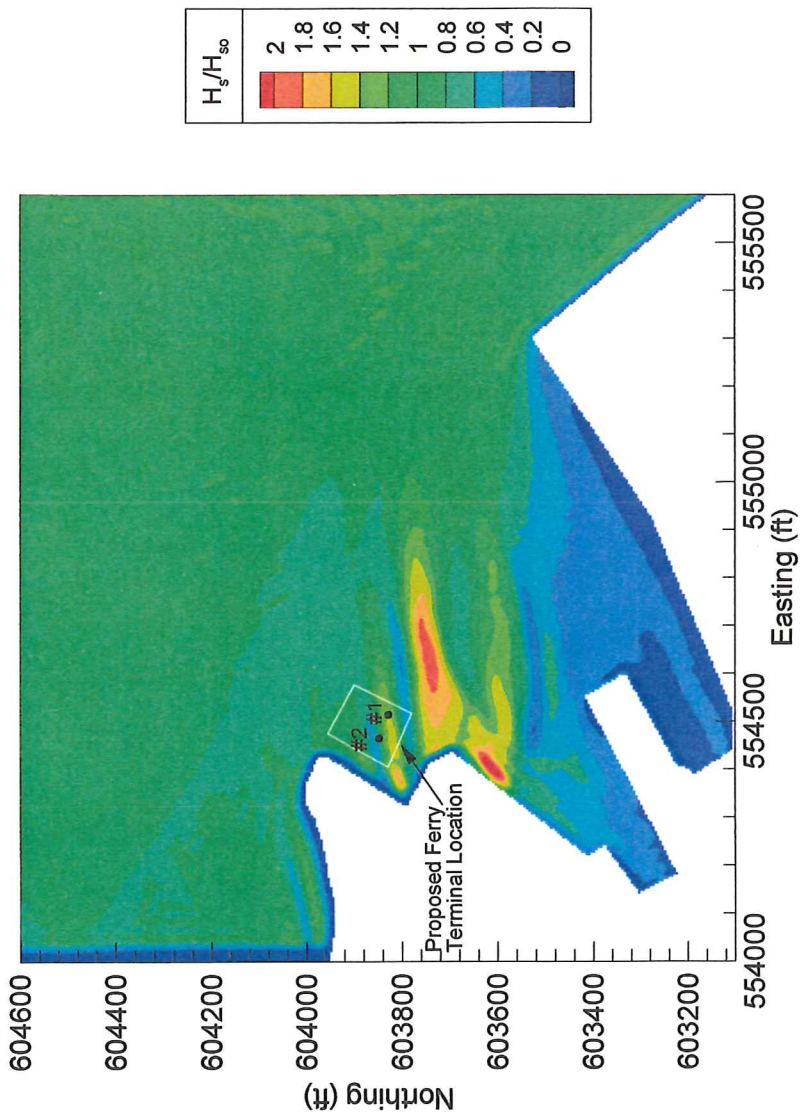


Fig. 7

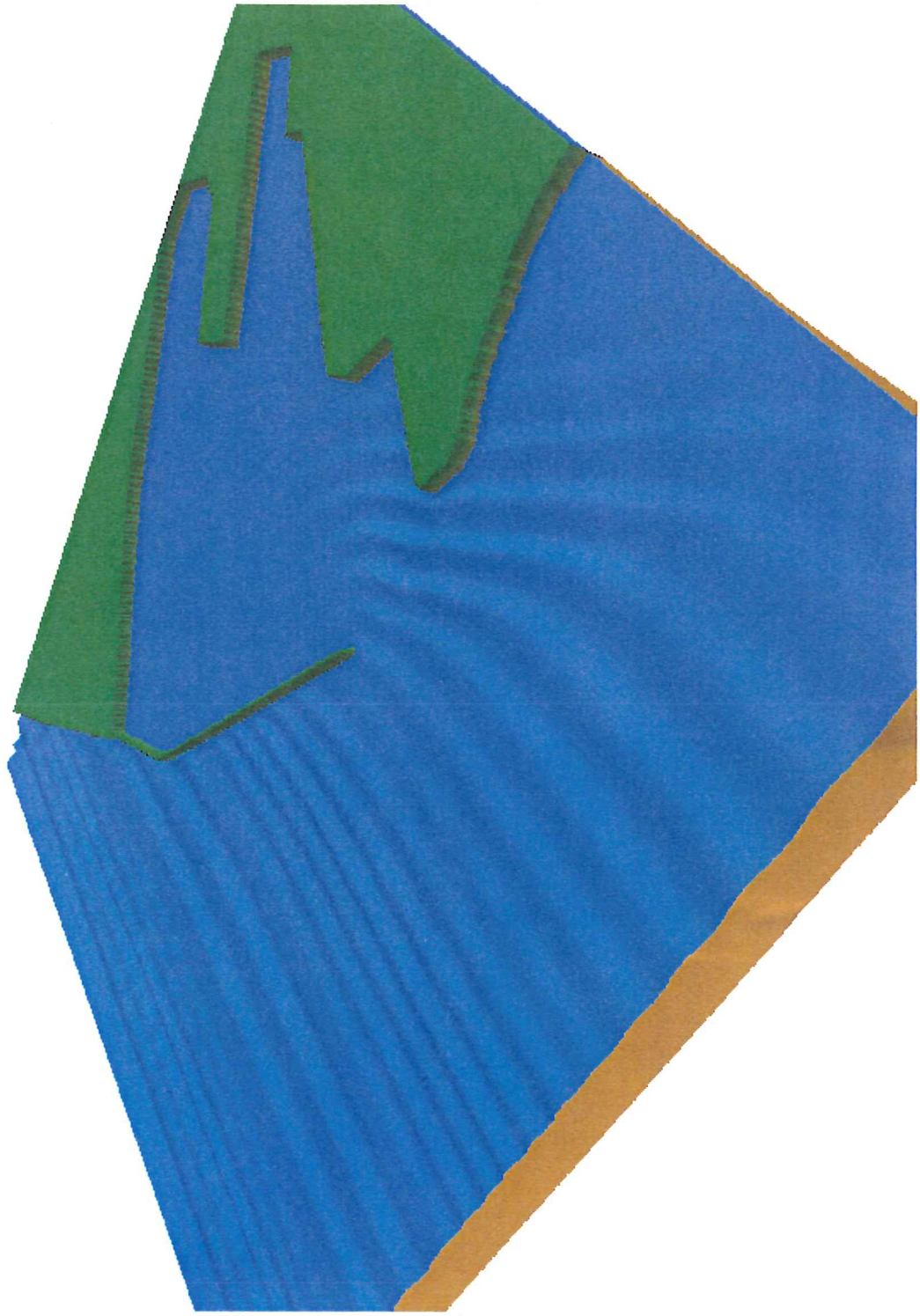


Fig. 8

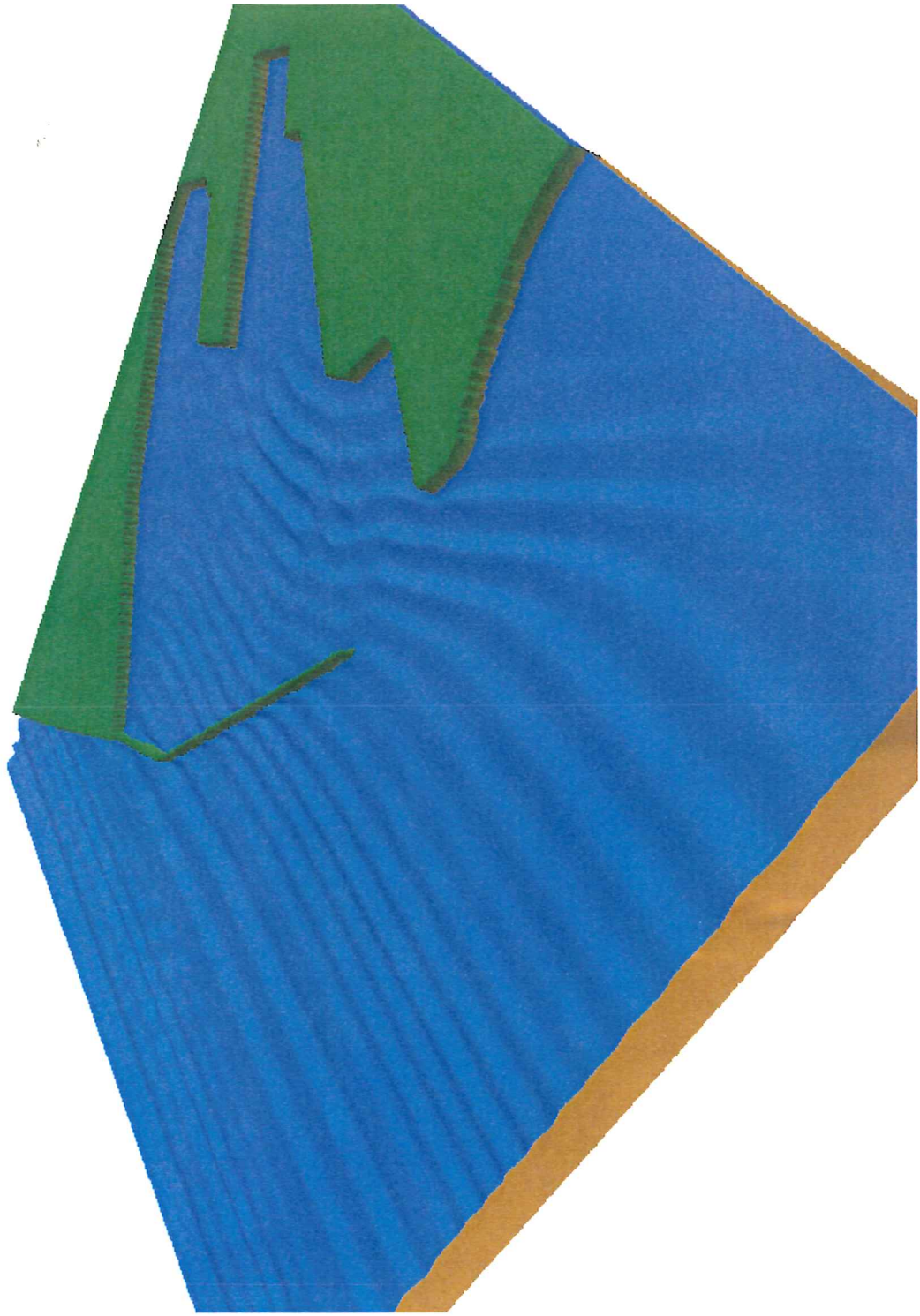


Fig. 9

Normalized Wave Height Distribution for Test Condition  
with 700-ft long Fixed Breakwater ( $T_p = 4.7s$ , Dir= East)

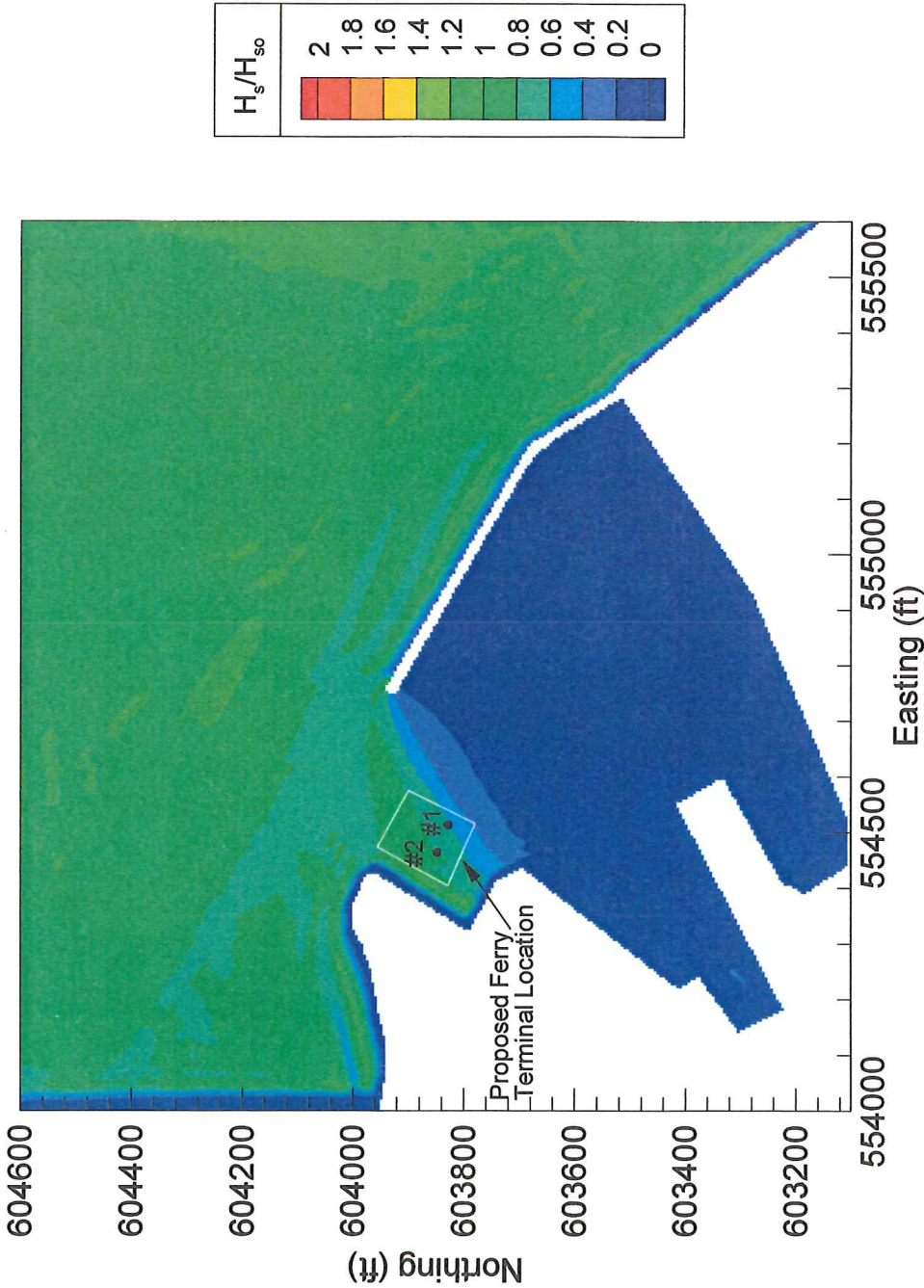


Fig. 10

Normalized Wave Height Distribution for Test Condition  
with 780-ft long Fixed Breakwater ( $T_p = 4.7s$ , Dir= East)

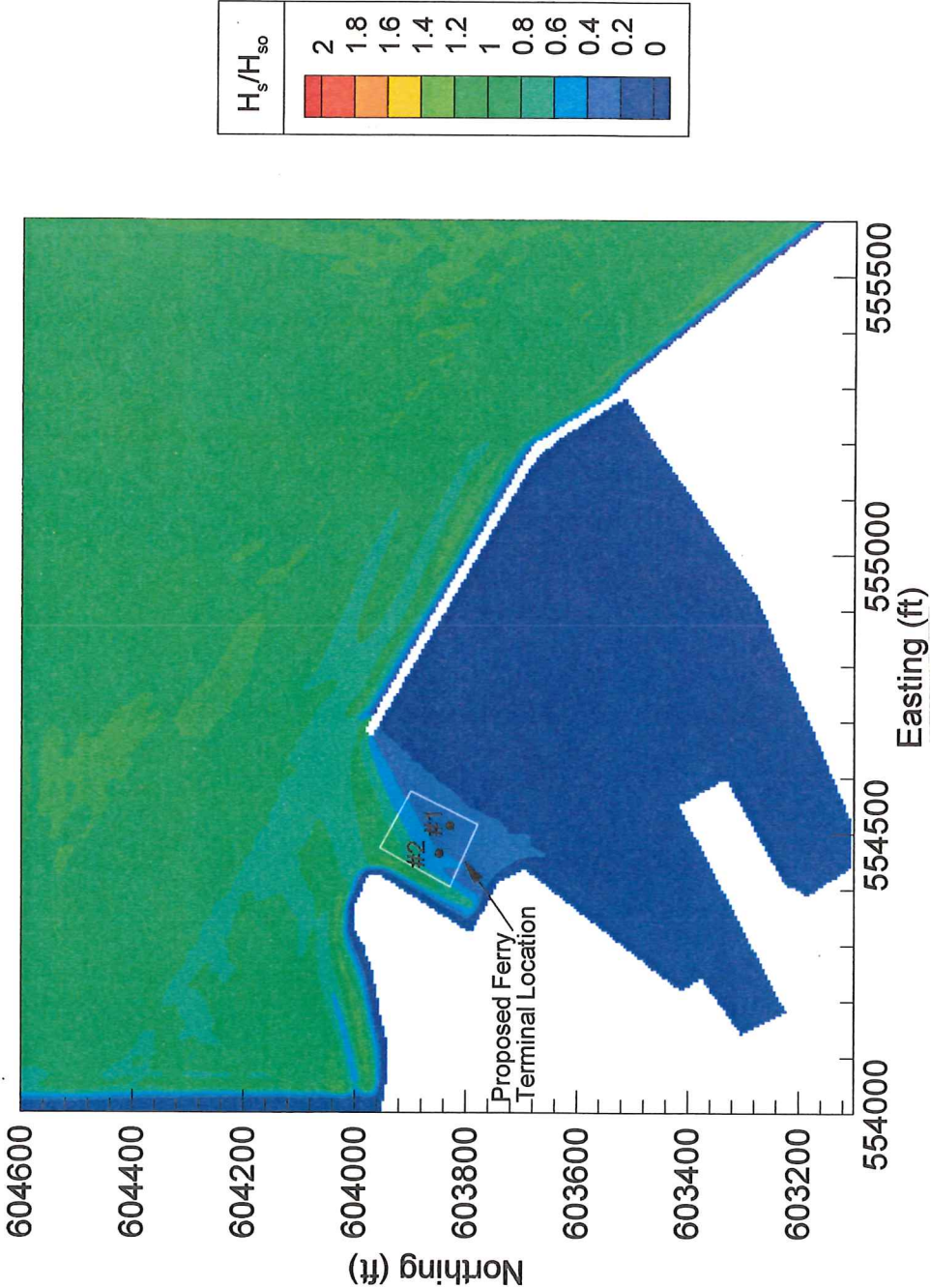


Fig. 11

Normalized Wave Height Distribution for Test Condition  
 with 850-ft long Fixed Breakwater ( $T_p = 4.7s$ , Dir= East)

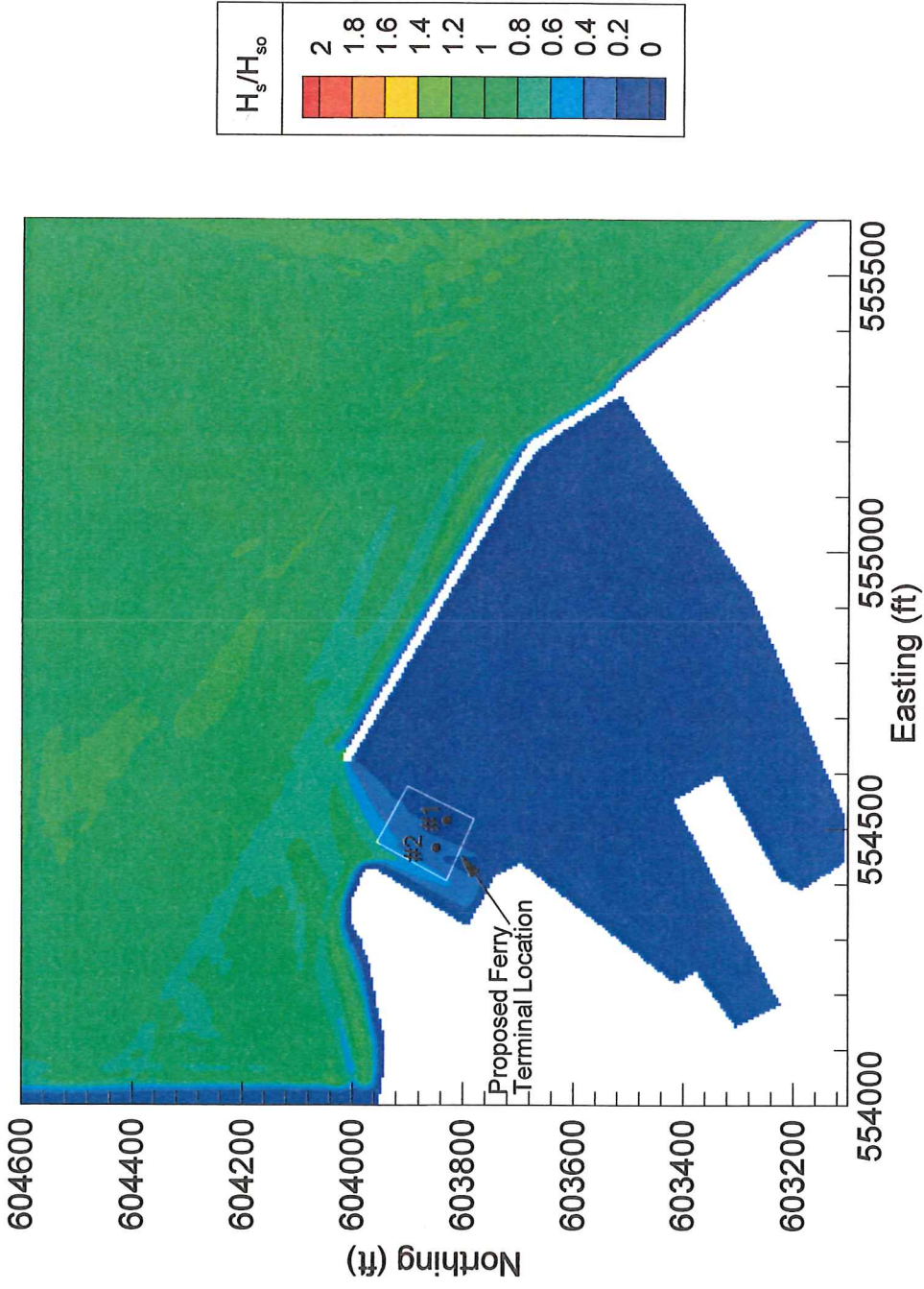


Fig. 12

Normalized Wave Height Distribution for Test Condition  
with 780-ft long Floating Breakwater ( $T_p = 4.7s$ , Dir= East)

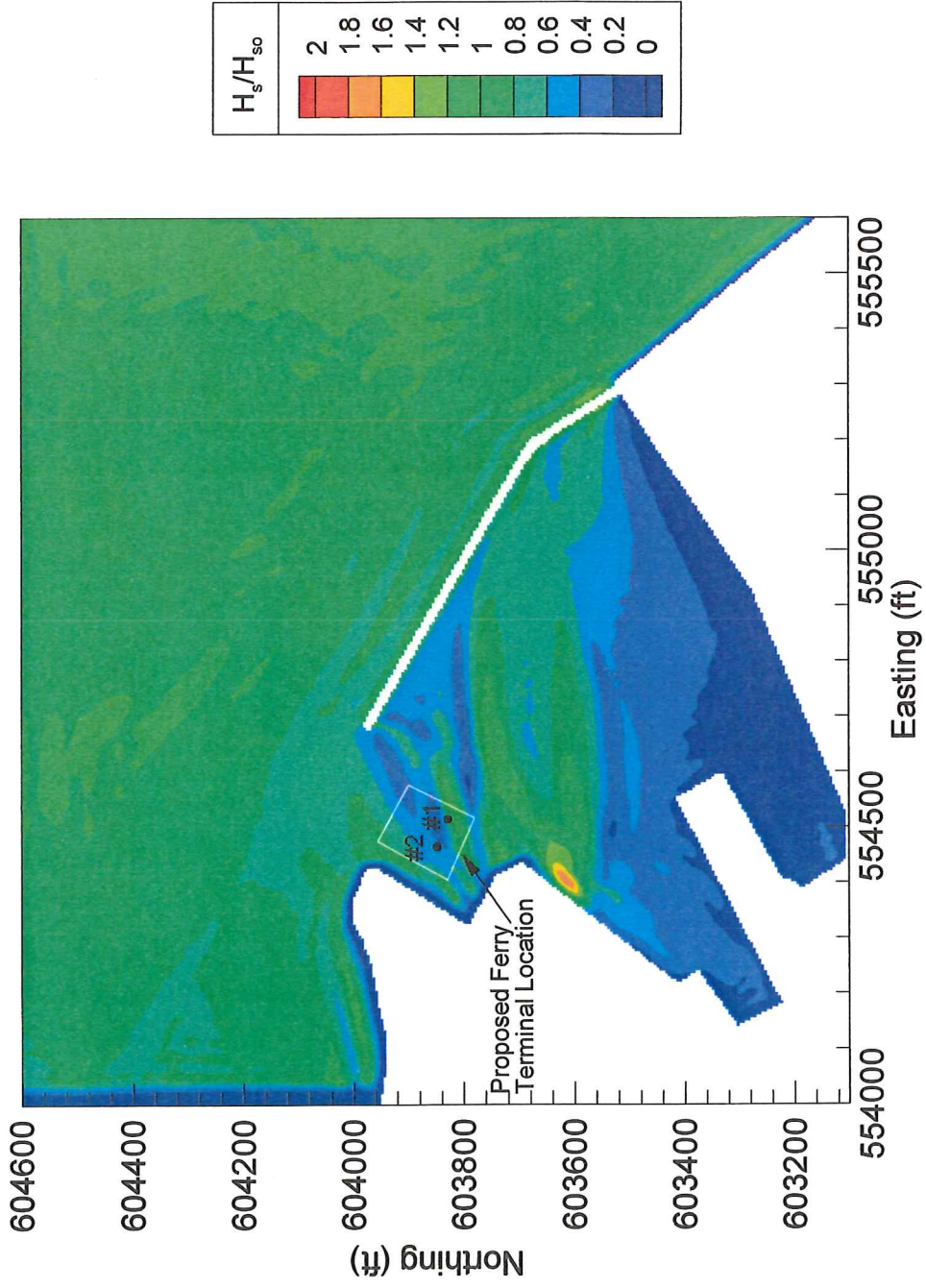


Fig. 13



Normalized Wave Height Distribution for Test Condition  
 with 850-ft long Floating Breakwater ( $T_p = 4.7s$ , Dir= East)

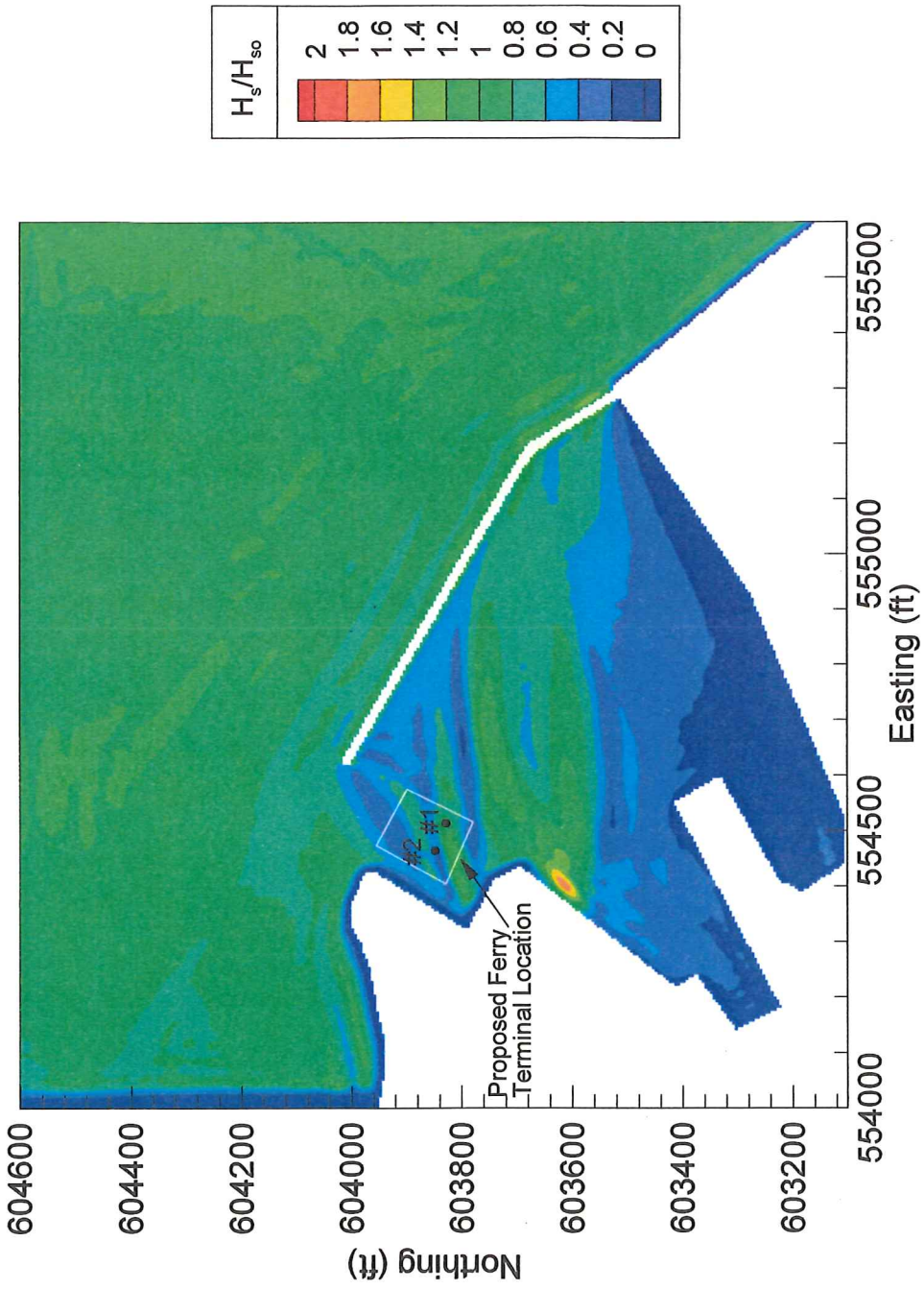


Fig. 14

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**APPENDIX E**  
**PUBLIC INVOLVEMENT**

---

**PUBLIC NOTICES:**

**8 February 2001**

**Public Meeting**



Potomac-Hudson Environmental, Inc.

RECEIVED

JAN 29 2001

166 John Street, P.O. Box 7, South Amboy, NJ 08879 (732) 525-3100 FAX: 525-9254  
136 W. 16th Street, P.O. Box 1206, New York, NY 10011 (212) 243-3574 FAX: 645-4634

25 January 2001

Stanley Marcinczyk  
Business Administrator  
City Hall  
140 North Broadway  
South Amboy, New Jersey 08879

**Re: Public Information Meeting  
Environmental Assessment of the Ferry Transportation Center**

Dear Stan:

As we discussed this date, I am proposing a "Public Information Meeting" to be held on 8 February 2001, between the hours of 4:00 pm – 8:00 pm.

I have attached a proposed announcement that should be placed in the local newspapers and any other means by which the City uses to make the public aware of an upcoming meeting.

The activities I would ask you to be responsible for include:

- arrangement for a location for the meeting;
- arrangement to use City's audio equipment to record meeting; and
- public notification of the meeting.

Once we have the location of the meeting identified, either you or I can place the announcement in the papers. Let me know which option you prefer.

In addition, the announcement needs to be specifically mailed to the following organizations:

- (i) Middlesex County Cultural & Heritage Commission  
841 Georges Road  
North Brunswick, NJ 08902  
Anna M. Aschkenes  
732-745-4489

Scientists • Planners • Engineers

Offices in the New York and Washington, D.C. metropolitan areas

- (ii) Sayreville Historical Society  
425 Main Street  
PO Box 18  
Sayreville, NJ 08872  
Helen Boehm, President  
732-257-0893
  
- (iii) South Amboy Historical Society  
109 Feltus Street  
South Amboy, NJ 08879  
Joseph Wojcieckowski

We need to stay pretty close in our coordination of this meeting. Please call me with any questions or information.

Thank you.

Sincerely,



David R. Draper  
Environmental Manager

**Notice of Public Information Meeting**

**Environmental Assessment/Section 4(f) and  
Section 106 of the National Historic Preservation Act Coordination  
For the Proposed  
South Amboy Ferry Terminal and Access Road**

A public information meeting on the subject project will be held on 8 February 2001 between the hours of 4:00 pm to 8:00 pm at the South Amboy \_\_\_\_\_, South Amboy, NJ. The meeting will be held under the provisions of 40 CFR Parts 1500-1508 (NEPA); and 36 CFR Part 800.2(c), 800.3, and 800.4 (Protection of Historic Places).

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The purpose of the meeting is to provide a status report on the identification of historic properties which may be affected by the proposed project. Comments and information are sought from the consulting parties and the public on historic sites and structures in and around the project area.

Z 194 172 821

US Postal Service  
Receipt for Certified Mail

No Insurance Coverage Provided.  
Do not use for International Mail. (See reverse)

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Street & Number	10910 Felton St.	
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Postage	\$ 1.90	
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt Showing to Whom & Date Delivered	1.40	
Return Receipt Showing to Whom, Date, & Addressee's Address		
TOTAL Postage & Fees	\$ 3.64	
Postmark or Date		

PS Form 3800, April 1995

Z 194 172 823

US Postal Service  
Receipt for Certified Mail

No Insurance Coverage Provided.  
Do not use for International Mail. (See reverse)

Sent to	Mallard Cultural Heritage	
Street & Number	841 Kenner St.	
Post Office, State, & ZIP Code	New Orleans, LA 70112	
Postage	\$ 1.90	
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt Showing to Whom & Date Delivered	1.40	
Return Receipt Showing to Whom, Date, & Addressee's Address		
TOTAL Postage & Fees	\$ 3.64	
Postmark or Date		

PS Form 3800, April 1995

Z 194 172 822

US Postal Service  
Receipt for Certified Mail

No Insurance Coverage Provided.  
Do not use for International Mail. (See reverse)

Sent to	Jaysville Historical Society	
Street & Number	403 Main Street	
Post Office, State, & ZIP Code	Jaysville, NY 13152	
Postage	\$ 1.90	
Certified Fee		
Special Delivery Fee		
Restricted Delivery Fee		
Return Receipt Showing to Whom & Date Delivered	1.40	
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Fold at line over top of envelope to the right of the return address.

Fold at line over top of envelope to the right of the return address.



# City of South Amboy

140 North Broadway • South Amboy, New Jersey 08879

Phone: 732-525-5933

Fax: 732-727-0650

Stanley R. Marcinczyk  
Business Administrator

January 29, 2001

## CERTIFIED MAIL

Sayreville Historical Society  
425 Main Street  
P. O. Box 18  
Sayreville, NJ 08872  
Re: Helen Boehm, President

Dear Ms. Boehm:

Enclosed find copy of official Notice of Public Information Meeting, the subject matter of which is generally described in said notice.

Very truly yours,

STANLEY MARCINCZYK  
City Business Administrator

cc: Dave Draper  
Mayor  
Council





# City of South Amboy

140 North Broadway • South Amboy, New Jersey 08879

Phone: 732-525-5933

Fax: 732-727-0650

Stanley R. Marcinczyk

*Business Administrator*

January 29, 2001

## CERTIFIED MAIL

Middlesex County Cultural & Heritage Commission

841 Georges Road

North Brunswick, NJ 08902

Attn: Anna M. Aschkenes

Dear Ms. Aschkenes:

Enclosed find copy of official Notice of Public Information Meeting, the subject matter of which is generally described in said notice.

Very truly yours,

STANLEY MARCINCZYK  
City Business Administrator

cc: Dave Draper  
Mayor  
Council



# City of South Amboy

140 North Broadway • South Amboy, New Jersey 08879

Phone: 732-525-5933

Fax: 732-727-0650

Stanley R. Marcinczyk  
Business Administrator

January 29, 2001

## CERTIFIED MAIL

South Amboy Historical Society  
109 North Feltus Street  
South Amboy, NJ 08879  
Re: Joseph Wojcieckowski

Dear Mr. Wojcieckowski:

Enclosed find copy of official Notice of Public Information Meeting, the subject matter of which is generally described in said notice.

Very truly yours,

STANLEY MARCINCZYK  
City Business Administrator

cc: Dave Draper  
Mayor  
Council

## **NOTICE OF PUBLIC INFORMATION MEETING**

### **Environmental Assessment /Section 4(f) and Section 106 of the National Historic Preservation Act Coordination For the Proposed South Amboy Ferry Terminal and Access Road**

A public information meeting on the subject project will be held on 8 February 2001 between the hours of 4:00 p.m. and to 8:00 p.m. at the South Amboy Senior Resource Center, 108 South Stevens Avenue, South Amboy, NJ. The meeting will be held under the provisions of 40 CFR Parts 1500-1508 (NEPA); and 36 CFR Part 800.2(c), 800.3, and 800.4 (Protection of Historic Places).

In summary, the Ferry Project consists of the rehabilitation of the Conrail bridge over Main Street, construction of a left-turn jughandle and access road from the bridge to the waterfront, construction of a terminal building, and construction of ancillary waterfront facilities to support operation of a high speed ferry to New York. Waterfront activities include installation of new bulkhead, dredging, and construction of piers and docks.

The purpose of the meeting is to provide a status report on the identification of historic properties which may be affected by the proposed project. Comments and information are sought from the consulting parties and the public on historic sites and structures in and around the project area.

**MEMORANDUM**

TO: MARY LOU DEBLIS, RECREATION DIRECTOR  
FROM: STANLEY MARCINCZYK, CITY BUSINESS ADMINISTRATOR  
DATE: JANUARY 29, 2001  
RE: PUBLIC INFORMATION MEETING

+++++

As part of State and Federal requirements associated with the TEA-21 Grant, we need to conduct a Public Information Meeting.

To that end, the Senior Resource Center will be the site for said meeting.

A series of announcements are likewise required. To that end, the enclosed notice should be announced on the City's Public Access Channel beginning no later than February 1, 2001.

All other notices (newspapers) will be handled by my office or that of the City Clerk.

The Department of Public Works will assist in "setting up" the meeting room for this event. Additional information will follow.

cc: Mayor  
Dave Draper  
Jerry Garnett, Superintendent of Public Works  
City Council  
File

\*\*\*\*\*  
 \* P.01  
 \* TRANSACTION REPORT  
 \* JAN-30-01 TUE 08:47 AM  
 \* DATE START RECEIVER TX TIME PAGES TYPE NOTE M# DP  
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**CITY OF SOUTH AMBOY**

**140 N Broadway**

**South Amboy, New Jersey 08879**

**Phone: 732-525-5933**

**FAX: 732-727-0650**

**John T. O'Leary  
 Mayor  
 Stanley Marcinczyk  
 City Business Administrator**

**FACSIMILE TRANSMITTAL SHEET**

TO: <i>Dave Draper</i>	FROM: <i>Stan Marcinczyk</i>
COMPANY:	DATE: <i>1/30/01</i>
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER: <i>6</i>
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

Page 3 of 3

**Notice of Public Information Meeting****Environmental Assessment/Section 4(f) and  
Section 106 of the National Historic Preservation Act Coordination  
For the Proposed  
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**Potomac-Hudson  
Environmental, Inc.**

---

**Potomac-Hudson Environmental, Inc.**

166 John Street, P.O. Box 7, South Amboy, NJ 08879 (732) 525-3100 FAX: 525-9254  
136 W. 16th Street, P.O. Box 1206, New York, NY 10011 (212) 243-3574 FAX: 645-4634

25 January 2001

Stanley Marcinczyk  
Business Administrator  
City Hall  
140 North Broadway  
South Amboy, New Jersey 08879

**Re: Public Information Meeting  
Environmental Assessment of the Ferry Transportation Center**

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Anna M. Aschkenes  
732-745-4489

Scientists • Planners • Engineers

Offices in the New York and Washington, D.C. metropolitan areas

Page 2 of 3

(ii) Sayreville Historical Society  
425 Main Street  
✓ PO Box 18  
Sayreville, NJ 08872  
Helen Boehm, President  
732-257-0893

(iii) South Amboy Historical Society  
109 Feltus Street  
South Amboy, NJ 08879  
Joseph Wojcieckowski

We need to stay pretty close in our coordination of this meeting. Please call me with any questions or information.

Thank you.

Sincerely,



David R. Draper  
Environmental Manager



### POTOMAC-HUDSON ENVIRONMENTAL, INC.

136 W. 16th. Street  
Suite 3E, POB 1206  
New York, NY  
(212) 243-3574  
FAX 645-4634

✓ 166 John Street  
POB 7  
South Amboy, NJ  
(732) 525-3100  
FAX 525-9254

4833 Rugby Avenue  
Suite 100  
Bethesda, MD  
(301) 907-9078  
FAX 907-3446

Date: 26 January 01

Please deliver the following page(s) to:

Name:

Fax No.:

(1) STAN MALLINZSK

727-0650

(2) \_\_\_\_\_

(3) \_\_\_\_\_

Client/Project: FERRY - INFORMATION MTNG

The original of this facsimile will be sent by:  ordinary mail  express mail

This will be the only form of delivery of this document

This correspondence is from:

Name: DANS DRAPER

Number of pages (including cover letter): 4

Notes/Messages:

PE

## **NOTICE OF PUBLIC INFORMATION MEETING**

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CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO:	<i>The Amboy Beacon</i>	FROM:	<i>Stan Marcinczyk</i>
COMPANY:		DATE:	<i>1/30/01</i>
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URGENT     FOR REVIEW     PLEASE COMMENT     PLEASE REPLY     PLEASE RECYCLE

NOTES/COMMENTS:

*Please publish once in the next available edition. Thank you.  
Any questions, please call.*

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CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

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COMPANY: DATE: *1/30/01*

FAX NUMBER: TOTAL NO. OF PAGES INCLUDING COVER: *2*

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\*\*\*\*\*  
 \* P. 01  
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**CITY OF SOUTH AMBOY**  
 140 N Broadway  
 South Amboy, New Jersey 08879  
 Phone: 732-525-5933 FAX: 732-727-0651

*John T. O'Leary*  
 Mayor  
*Stanley Marcinczyk*  
 City Business Administrator

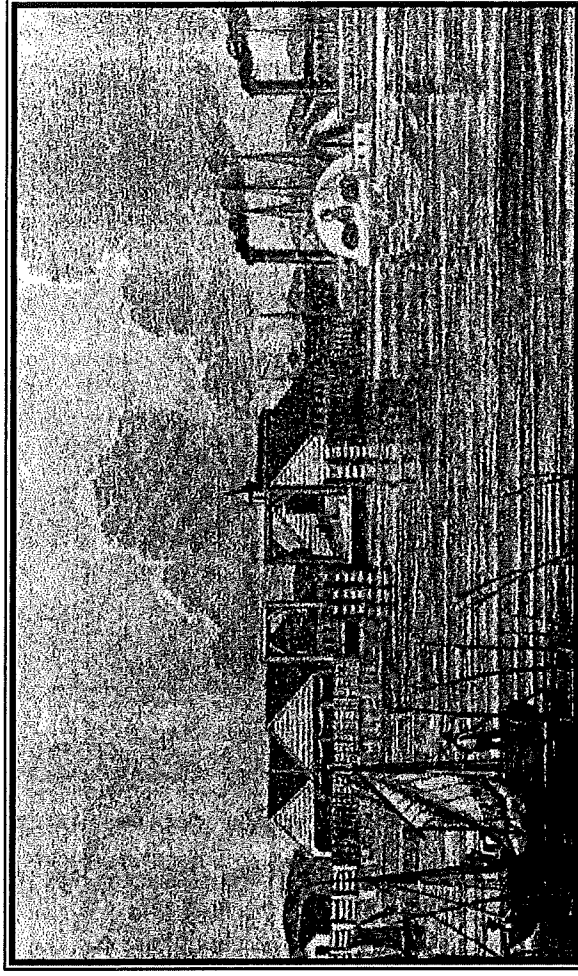
FACSIMILE TRANSMITTAL SHEET

TO: <i>The Home News Tribune</i>	FROM: <i>Stan Marcinczyk</i>
COMPANY:	DATE:
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
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RE:	YOUR REFERENCE NUMBER:

SOUTH AMBOY FERRY PROJECT  
PUBLIC INFORMATION MEETING  
FEBRUARY 8, 2001

SIGN-IN INFORMATION	ADDRESS	PHONE NUMBER	CONTACT PERSON (Optional)
STAN MARCINIEWICZ	140 No. Bodway St	732-525-5933	
MIKE WILDAY	151 Conlogue Ave	(732) 727-0670	
JOHN SZATKOWSKI	340 HENRY ST	732-525-0134	
Marylou DeBlis	269 2nd St, SA	732-721-5617	
BILL SKOTCHDOPOPE	3141 BORDENTOWN AVE	732-727-8000	
MICHAEL McCLINTOCK	3141 BORDENTOWN AVENUE	732 727-8000	
B. Judith Leitch	8 Weber Terr.	732-721-8016	
FRANK HENDERSON	SANVILLE HO. Society	732-244-8703	
JAMES SCHULTZ	NSHA	732-442-8600	
Pat Shannon	93 Popok Rd.	732-727-0765	
John Mc Kern	165 Main St	732 727-9076	
E. Busiada	39, Swain St.	732-727-7132	
Allan Russell	431 Henry St	732 721-7759	
KEVIN RILEY	273 N Stevens Ave	732- <del>727</del> -36-007	

# PROPOSED SOUTH AMBOY FERRY TERMINAL AND ACCESS ROAD



Source: Cunniffham, John T. *Railroads in New Jersey*. 1997.

An 1850s woodcut showing the Camden and Amboy Railroad wharves in South Amboy, New Jersey.

**For more information contact:**

Lauralee Rappleye-Marsett  
New Jersey Department of Transportation  
1035 Parkway Avenue, CN 600  
Trenton, NJ 08625

Phone: (609) 530-2990

SECTION 106 OF THE  
NATIONAL HISTORIC PRESERVATION ACT OF 1966  
(AS AMENDED)



## BACKGROUND

The National Historic Preservation Act of 1966 sets out procedures for ensuring that important historic properties are taken into account when federally-funded or authorized undertakings are planned.

The South Amboy Ferry Terminal Project falls under the provisions of Section 106 of the National Historic Preservation Act because part of the funding for the project comes from the Federal Highway Administration.

## WHAT IS SECTION 106?

Section 106 requires federal agencies to take into account the effect of any undertaking on historic properties (districts, sites, structures, buildings, or objects) that are included in or are eligible for the National Register of Historic Places. The National Register is the official list of the country's important historic properties. Properties can be determined to be "eligible" for the National Register before they have been formally entered onto it.

## THE SECTION 106 PROCESS

The way in which federal agencies' responsibilities are carried out is set out in federal regulation 36CFR Part 800: Protection of Historic Properties. Federal agencies are particularly required to "seek and consider the views of the public." There are several stages to the Section 106 process, and the following is a brief summary:

**1. Federal agency determines that the project (or "undertaking") falls under Section 106.**

**2. Consultation begins with the State Historic Preservation Office.** Other consulting parties are also identified and invited to participate. Public meetings like this one are part of the consultation process, as is defining the area of potential effect (APE).

The federal agency is responsible for defining the APE, reviewing existing information on historic properties, and seeking additional information on the location of historic properties. The APE is being defined through the use of maps

and visual analysis of the area around the proposed Ferry Terminal and Access Road.

**3. Historic properties are identified.** The South Amboy project is about to begin the identification stage of the Section 106 process. Currently:

- Background research has been undertaken on the project site, which has been determined to be eligible for the National Register as part of the Camden and Amboy Railroad Historic District. The site was the northern terminus of one of the first railroads in the United States, built in the 1830s.

- Archaeologists, historians, and architectural historians will undertake more research to find out if there are important physical remains of buildings or structures relating to the railroad or if there are historically important buildings near the project that might be affected by it.

**4. Historic properties are evaluated.** Not all historic properties are eligible for the National Register, and each property has to be evaluated against written criteria of significance. We already know that the historic district is eligible, but we don't yet know if there are individ-

ual properties that may also be eligible. This will be done through archaeological excavations and architectural surveys in the near future.

**5. The effects of the undertaking are assessed.** One important question we must ask is will the proposed Ferry Terminal Project adversely affect (i.e., harm or damage) properties on or eligible for the National Register? If the effects are adverse, the federal agency is responsible for resolving those effects. At this point, we do not know if the project will adversely affect any historic properties.

**6. Adverse effects are resolved.** If the project does have adverse effects on any historic properties, these must be resolved. The federal agency then consults with the State Historic Preservation Office and the other consulting parties to find alternatives to the undertaking which will avoid, minimize or mitigate the adverse effects. These can include redesign of the project or extensive documentation and research on historic properties that will be affected.

The ways in which adverse effects are to be dealt with are set out in a Memorandum of Agreement.

**PUBLIC NOTICES:**

**27 June 2001  
Public Meeting**



**Potomac-Hudson Environmental, Inc.**

166 John Street, P.O. Box 7, South Amboy, NJ 08879 (732) 525-3100 FAX: 525-9254  
136 W. 16th Street, P.O. Box 1206, New York, NY 10011 (212) 243-3574 FAX: 645-4634

18 June 2001

**RECEIVED**

**JUN 18 2001**

Stanley Marcinczyk  
Business Administrator  
City Hall  
140 North Broadway  
South Amboy, New Jersey 08879

**Re: Public Information Meeting  
Environmental Assessment of the Ferry Transportation Center**

Dear Stan:

As we discussed this date, I am proposing a "Public Information Meeting" to be held on 27 June 2001, between the hours of 4:00 pm – 7:00 pm.

I have attached a proposed announcement that should be placed in the local newspapers and any other means by which the City uses to make the public aware of an upcoming meeting.

As with the previous public meeting, the activities I would ask you to be responsible for include:

- arrangement for a location for the meeting;
- arrangement to use City's audio equipment to record meeting; and
- public notification of the meeting.

Once we have the location of the meeting identified, either you or I can place the announcement in the papers. Let me know which option you prefer.

In addition, the announcement needs to be specifically mailed to the following organizations:

- (i) Middlesex County Cultural & Heritage Commission  
841 Georges Road  
North Brunswick, NJ 08902  
Anna M. Aschkenes  
732-745-4489

**Scientists • Planners • Engineers**

Offices in the New York and Washington, D.C. metropolitan areas

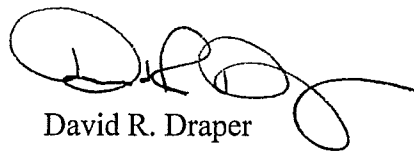
(ii) Sayreville Historical Society  
425 Main Street  
PO Box 18  
Sayreville, NJ 08872  
Helen Boehm, President  
732-257-0893

(iii) South Amboy Historical Society  
109 Feltus Street  
South Amboy, NJ 08879  
Joseph Wojcieckowski

Please call me with any questions or information.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "David R. Draper", with a large, stylized flourish extending to the right.

David R. Draper

**Notice of Public Information Meeting**

**Environmental Assessment/Section 4(f) and  
Section 106 of the National Historic Preservation Act Coordination  
For the Proposed  
South Amboy Ferry Terminal and Access Road**

A public information meeting on the subject project will be held on 27 June 2001 between the hours of 4:00 pm to 7:00 pm at the South Amboy Senior Citizens Center, South Amboy, NJ. The meeting will be held under the provisions of 40 CFR Parts 1500-1508 (NEPA); and 36 CFR Part 800.2(c), 800.3, and 800.4 (Protection of Historic Places).

In summary, the Ferry Project consists of the provision of site access across Main Street using a reconstructed ConRail Bridge, construction of a left-turn jughandle and access road from the bridge to the waterfront, construction of a terminal building, and construction of ancillary waterfront facilities to support operation of a high speed ferry to New York. Waterfront activities include installation of new bulkhead, dredging, and construction of piers and docks.

The purpose of the meeting is to provide a status report on the identification of historic properties that may be affected by the proposed project. Comments and information are sought from the consulting parties and the public on historic sites and structures in and around the project area.

CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: *The Home News Tribune* FROM: *Stan Marcinczyk*  
COMPANY: DATE:

FAX NUMBER: TOTAL NO. OF PAGES INCLUDING COVER:

PHONE NUMBER: SENDER'S REFERENCE NUMBER:

RE: YOUR REFERENCE NUMBER:

URGENT  FOR REVIEW  PLEASE COMMENT  PLEASE REPLY  PLEASE RECYCLE

NOTES/COMMENTS:

*Please publish once in the Thursday, February 1st, 2001 edition. Please send bill & proof of publication to attn: Mary Sue Felice. Thank you.*

*P.O # 0130*

CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: The Home News FROM: Stan Marcinczyk  
 COMPANY: Tribune DATE: 6/19/01  
 FAX NUMBER: \_\_\_\_\_ TOTAL NO. OF PAGES INCLUDING COVER: \_\_\_\_\_  
 PHONE NUMBER: \_\_\_\_\_ SENDER'S REFERENCE NUMBER: 2  
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- URGENT     FOR REVIEW     PLEASE COMMENT     PLEASE REPLY     PLEASE RECYCLE

NOTES/COMMENTS:

Please publish once in the  
 Thursday, 6/21/01 edition  
 of the paper. Send proof +  
 bill to attn: Mary Sue Felice  
 P.O# 0619

CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: <i>Mary Lou</i>	FROM: <i>Linda</i>
COMPANY:	DATE: <i>6/19/01</i>
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER: <i>2</i>
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RE:	YOUR REFERENCE NUMBER:

URGENT     FOR REVIEW     PLEASE COMMENT     PLEASE REPLY     PLEASE RECYCLE

NOTES/COMMENTS:

*Mr. Marcinczyk asked that you place this notice on the cable channel and mark this date on the Center's calendar.*

*Thanks*



TRANSACTION REPORT

P. 01

JUN-19-2001 TUE 02:35 PM

DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
JUN-19	02:34 PM	5250048	1'13"	2	SEND	OK	818	

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CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: <i>Bill George</i>	FROM: <i>STAN MARCINCZYK</i>
COMPANY:	DATE: <i>6/19/01</i>
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P. 01

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JUN-19	02:35 PM	3161221	44"	2	SEND	OK	819	

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CITY OF SOUTH AMBOY

140 N Broadway

South Amboy, New Jersey 08879

Phone: 732-525-5933

FAX: 732-727-0650

John T. O'Leary

Mayor

Stanley Marcinczyk

City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: <i>Mary Lou</i>	FROM: <i>Lida</i>
COMPANY:	DATE: <i>6/19/01</i>
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER: <i>2</i>
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 \* TOTAL : 45S PAGES: 2  
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**CITY OF SOUTH AMBOY**  
 140 N Broadway  
 South Amboy, New Jersey 08879  
 Phone: 732-525-5933 FAX: 732-727-0650

*John T. O'Leary*  
 Mayor  
*Stanley Marcinczyk*  
 City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: <i>Mary Lou</i>	FROM: <i>Lisa</i>
COMPANY:	DATE: <i>6/19/01</i>
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER: <i>2</i>
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RE:	YOUR REFERENCE NUMBER:

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 \* TRANSACTION REPORT  
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**CITY OF SOUTH AMBOY**  
 140 N Broadway  
 South Amboy, New Jersey 08879  
 Phone: 732-525-5933 FAX: 732-727-0650

*John T. O'Leary*  
 Mayor  
*Stanley Marcinczyk*  
 City Business Administrator

FACSIMILE TRANSMITTAL SHEET

TO: *The Home News* FROM: *Stan Marcinczyk*  
 COMPANY: *Tribune* DATE: *6/19/01*  
 FAX NUMBER: TOTAL NO. OF PAGES INCLUDING COVER: *2*  
 PHONE NUMBER: SENDER'S REFERENCE NUMBER:  
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# HOME NEWS TRIBUNE

CLASSIFIED LEGAL ADVERTISING  
TEL (732)246-5668  
FAX (732)565-7469

## ***FAX CONFIRMATION***

*Thank you for your recent fax which was*

**Received (Date, Time): 2001-06-19 14:58:07**  
**AdFAX receipt number: 016J0128.001**  
**Pages received: 2**

Your notice will be published on the next available publication date unless otherwise requested.

<b>Date of Publication</b>	<b>Deadline</b>
Monday	Friday, 10:30am
Tuesday	Friday, 4:30pm
Wednesday	Monday, 4:30pm
Thursday	Tuesday, 4:30pm
Friday	Wednesday, 4:30pm
Saturday	Thursday, 4:30pm
Sunday	Thursday, 4:30pm

*We look forward to continuing to serve you,  
our customer, in the future.*

# Affidavit of Publication

Publisher's Fee \$34.98

Affidavit Charge \$16.00

State of New Jersey } ss.

MIDDLESEX COUNTY

Personally appeared PAT HENEGHAN

of the **Home News Tribune**, a newspaper printed in Freehold, NJ and published in NEPTUNE, in said County and State, and of general circulation in said county, who being duly sworn, depose and saith that the advertisement of which the annexed is a true copy, has been published in the said newspaper 1 (ONE) times, once in each issue, as follows

6/21/01,

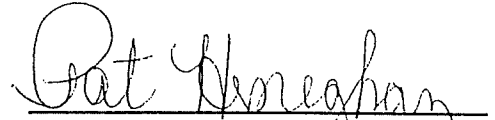
A.D., 2001

KATHLEEN M. ROCHELLE

Notary Public of New Jersey

My Commission Expires Jan. 27, 2005

Notary Public of New Jersey



Sworn and subscribed before me this

21st day of June, A.D., 2001

CITY OF SOUTH AMBOY

Notice of Public Information Meeting Environmental Assessment/Section 4(f) and Section 106 of the National Historic Preservation Act Coordination For the Proposed South Amboy Ferry Terminal and Access Road

A public information meeting on the subject project will be held on June 27, 2001 between the hours of 4:00 p.m. to 7:00 p.m. at the South Amboy Senior Citizens Center, South Amboy, NJ. The meeting will be held under the provisions of 40 CFR Parts 1500-1508 (NEPA); and 36 CFR Part 800.2(c), 800.3, and 800.4 (Protection of Historic Places).

In summary, the Ferry Project consists of the provisions of site access across Main Street using a reconstructed ConRail Bridge, construction of a left-turn jughandle and access road from the bridge to the waterfront, construction of a terminal building and construction of ancillary waterfront facilities to support operation of a high speed ferry to New York. Waterfront activities include installation of new bulkhead, dredging, and construction of piers and docks.

The purpose of the meeting is to provide a status report on the identification of historic properties that may be affected by the proposed project. Comments and information are sought from the consulting parties and the public on historic sites and structures in and around the project area. (S34.98) 24136

RECEIVED  
JUN 27 2001



# City of South Amboy

140 North Broadway • South Amboy, New Jersey 08879

Phone: 732-525-5933

Fax: 732-727-0650

Stanley R. Marcinczyk  
Business Administrator

June 19, 2001

Sayreville Historical Society  
425 Main Street  
Sayreville, NJ 08872  
Attn: Helen Boehm, President

Dear Ms. Boehm:

Enclosed please find a Notice advertising a "Public Information Meeting" to be held on Wednesday, June 27, 2001 from 4 p.m. to 7 p.m. at the South Amboy Senior Citizens Center, 108 South Stevens Avenue, South Amboy, NJ 08879.

Very truly yours,

STANLEY MARCINCZYK  
City Business Administrator



# City of South Amboy

140 North Broadway • South Amboy, New Jersey 08879

Phone: 732-525-5933

Fax: 732-727-0650

**Stanley R. Marcinczyk**  
Business Administrator

June 19, 2001

South Amboy Historical Society  
109 Feltus Street  
South Amboy, NJ 08879  
Attn: Joseph Wojcieckowski

Dear Mr. Wojcieckowski:

Enclosed please find a Notice advertising a "Public Information Meeting" to be held on Wednesday, June 27, 2001 from 4 p.m. to 7 p.m. at the South Amboy Senior Citizens Center, 108 South Stevens Avenue, South Amboy, NJ 08879.

Very truly yours,

STANLEY MARCINCZYK  
City Business Administrator

(S)





# City of South Amboy

140 North Broadway • South Amboy, New Jersey 08879

Phone: 732-525-5933

Fax: 732-727-0650

**Stanley R. Marcinczyk**  
Business Administrator

June 19, 2001

Middlesex County Cultural & Heritage Commission  
841 Georges Road  
North Brunswick, NJ 08902  
Attn: Anna M. Aschkenes

Dear Ms. Aschkenes:

Enclosed please find a Notice advertising a "Public Information Meeting" to be held on Wednesday, June 27, 2001 from 4 p.m. to 7 p.m. at the South Amboy Senior Citizens Center, 108 South Stevens Avenue, South Amboy, NJ 08879.

Very truly yours,

  
STANLEY MARCINCZYK  
City Business Administrator 

## **Notice of Public Information Meeting**

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SOUTH AMBOY FERRY

PUBLIC INFORMATION MEETING

27 JUNE 01

<u>NAME</u>	<u>ADDRESS</u>	<u>PHONE</u>
Carol Lukie	100 O'Leary Blvd, #409	721- <del>5629</del> 1167
William Heffron	7 Newark Ave Spotswood, NJ 08884	(732) 723-1190
FRANK KRZYWIZINSKI	110 N. BROADWAY	721-3005

CEK

## **1.0 INTRODUCTION**

This Public Information Meeting is held under the provisions of 40 CFR Parts 1500-1508 (NEPA); and 36 CFR Part 800.2(c), 800.3, and 800.4 (Protection of Historic Places).

The purpose of this meeting is to provide a status report on the identification of historic properties which may be affected by the proposed project and to obtain comments and information from the consulting parties and the public on historic sites and structures in and around the project area.

## **2.0 DESCRIPTION OF THE PROPOSED ACTION**

The project action consists of the construction of an upland access roadway, parking area, and ferry terminal; and in-water marine improvements to accommodate the operation of up to three ferry vessels. The marine improvements include dredging of the ferry basin, slips, and access channel, construction of a breakwater and associated slips for the ferry and support vessels, and installation of new bulkhead. A summary of the project components is provided below and illustrated on Figure 3-1, Proposed Action Alternative.

### **Main Street Crossing**

The Main Street crossing would utilize the part of the reconstructed "ConRail" overpass (Note: The reconstruction of the overpass is proceeding independently of the development of the ferry operation). The access road leading to the overpass across Main Street would require a new signalized intersection at Main Street, including acceleration and deceleration lanes along Main Street and a left turn jug handle.

### **Access Roadway and Parking Area**

Access to the proposed ferry terminal would require the construction of an approximately 2,500-linear foot access roadway linking Main Street with the ferry terminal. The two-lane access road plus shoulders would cross Main Street via the ConRail overpass and continue towards the proposed ferry terminal and parking area following the route of an existing unpaved roadway used by vehicles associated with McCormick Aggregate, a sand and gravel facility.

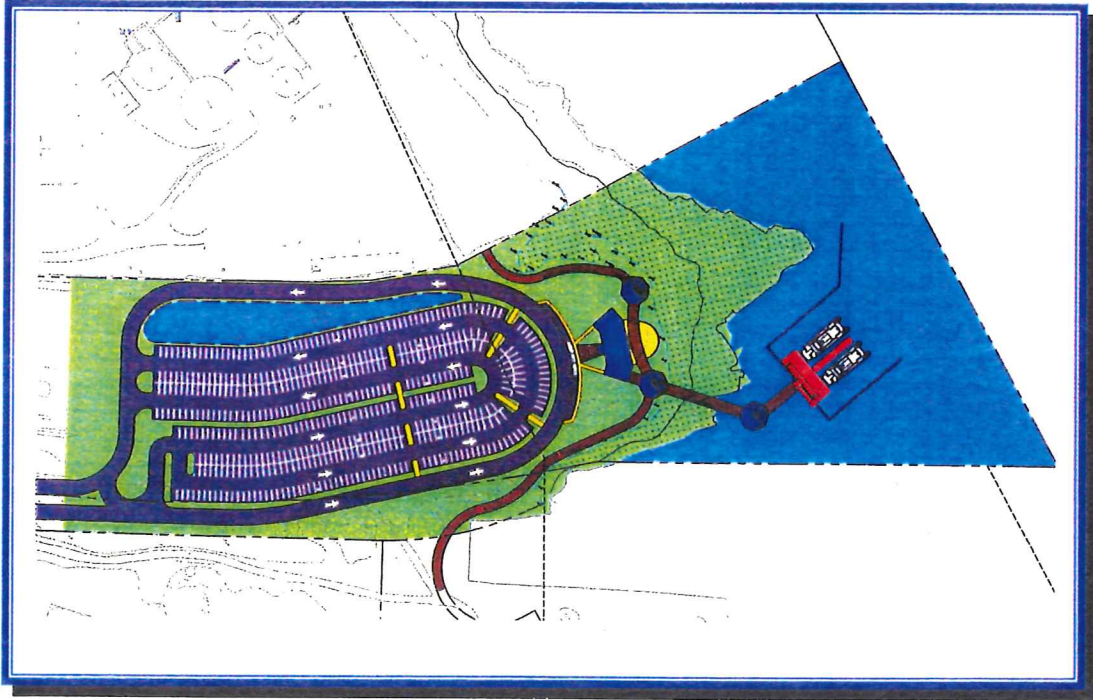
The paved at-grade parking area would be designed to accommodate approximately 500 cars.

### **Ferry Terminal**

The ferry terminal building would entail the construction of an approximately 10,000 sf facility to accommodate both terminal offices and ticket sales. Access to the ferry docks, which are located in a deeper water area to be dredged as part of this project, would be along an elevated walkway from the mainland to the dock.

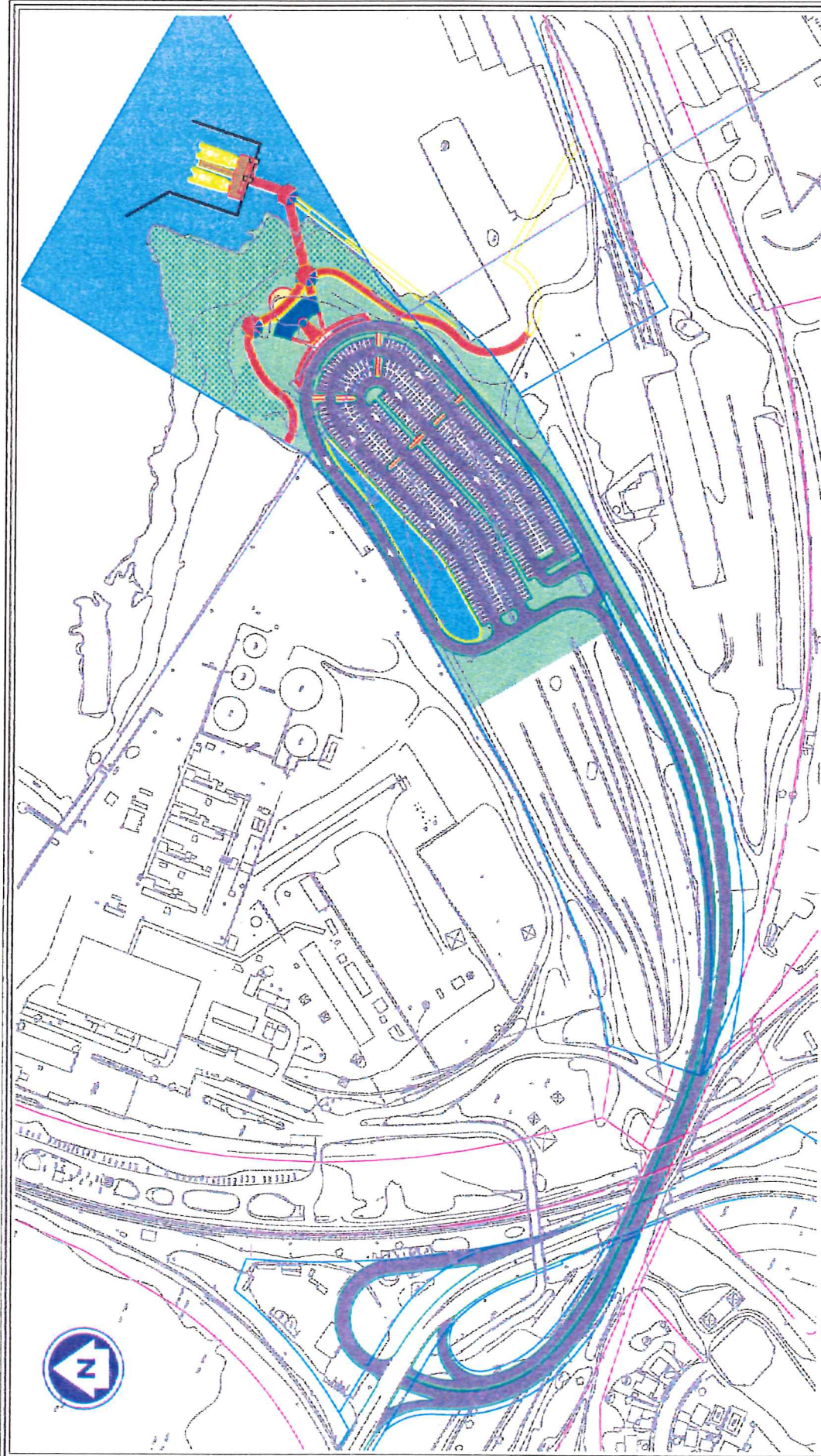
# PUBLIC INFORMATION MEETING

**Environmental Assessment/Section 4(f) and  
Section 106 of the National Historic Preservation Act Coordination  
For the Proposed  
South Amboy Ferry Terminal and Access Road**



27 JUNE 2001





**Figure 3-1**

**Proposed Action Alternative**  
**South Amboy Ferry Terminal Project**  
**City of South Amboy, New Jersey**

<p><b>Potomac-Hudson Environmental, Inc.</b>  <b>Scientists</b>          Planners          Engineers</p> <p>130 W. 18th Street          Suite 3E, POB 1208          New York, NY 10011</p> <p>22 Clarendon Avenue          Jersey City, NJ 07310</p>	<p><b>AS SHOWN</b></p> <p>SCALE</p> <p>35,0413</p> <p>PROJECT #</p> <p>FILE</p> <p>E:\projects\southamboyferry\temp\proj\ ferry\east.dwg</p>	<p>PO Box 7          1600 1st Ave          South Amboy, NJ 08870</p> <p>DATE          June 2001</p> <p>DRAWN BY          MDS</p> <p>REVIEWED BY          MIM</p> <p>SOURCE          CME Associates</p>
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APPROXIMATE SCALE  
(IN FEET)

## **Dredging and Dredged Material Disposal**

Approximately 36,000 cy of sediments have been estimated to be dredged to provide sufficient depths within the ferry basin, slips, and access channel. All dredged material would be disposed in an upland location.

## **Breakwater**

An approximately 900-foot breakwater would be installed to provide protection for the ferry operation and associated basin. Hydrographic modeling has been undertaken to simulate the wave fetch and energy anticipated at the ferry facility and this information has formed the basis for determining the breakwater size and composition. Several alternative designs have been evaluated, but a floating-type breakwater is proposed.

## **Bulkhead and Slips**

Approximately 2,200-linear feet of bulkhead would be installed within the ferry basin, including replacement of approximately 1,200 feet of degraded bulkhead and 1,000 feet of new bulkhead. The ferry dock would be designed for two ferry slips.

## **Public Access**

A 14-foot wide public access walkway is proposed to extend along the waterfront. In the vicinity of the ferry terminal building, a central overlook with flanking viewing gazebos would be provided.

## **Future Development**

It is anticipated that a future phase of the project would include construction of a retail/restaurant complex adjacent to the ticket sales office and a recreational marina within the ferry basin.

## **2.0 UPDATE ON THE HISTORICAL ASPECTS OF THE PROJECT AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT OF 1966 (AS AMENDED)**

Since the last public meeting held on 7 February 2001, research and field investigations have been continuing with the objective of identifying significant historic features within the project area of effect, and assessing possible impacts of the proposed ferry terminal and associated infrastructure upon them

### **Consultation with State Historic Preservation Office (SHPO)**

There has been agreement from the SHPO on the Area of Potential Effect (APE) of the project, which has enabled research to go ahead. A meeting has been held with a representative of SHPO to discuss in more detail the likely significance of individual structures and archaeological features within the APE. The importance of the area as part of the Camden and Amboy Railroad National Historic District has been emphasized in these discussions. A phased approach to the APE is being developed which divides the overall project area into three parts. The first part is the area specifically identified for new road access, parking and the ferry terminal.

### **Identification of Historic Properties**

Historical research has continued to assemble information about the property, which has changed considerably since the first railroad buildings were erected in the 1830's. A major episode in the history of the site was the explosion on May 19th 1950 at the explosives pier, which damaged many buildings on the site and in South Amboy itself.

The two major standing structures immediately to the south of the project area are thawing plants. Coal trains were driven into these long buildings and steam, produced in boilers heated by coal-fired furnaces, was forced up through the floors under the coal wagons to thaw the coal in the winter months before it was shipped. The southern of the two buildings was probably built in the First World War, and the larger northern one in World War II. They are rare examples of this type of facility and may be the only examples in New Jersey.

Other than these two buildings there are very few above-ground features from the Railroad era. Remains of some of the tracks are present in places, and a few lamp posts and other railroad features have been identified. At the shoreline there are substantial remains of piers and lengths of revetment walling. In this area a number of the distinctive stone blocks used as rail ties in the early years of the Camden and Amboy Railroad have been located. These items are certainly historically significant and should be salvaged and preserved, perhaps by incorporation into landscaping treatments at the new terminal.

The early 20th century Pennsylvania Railroad reinforced concrete bridge which carried the railroad over Main Street and the present New Jersey Transit coast line is a significant historic property by reason of its function as part of the Historic District. Engineering studies indicate that this structure cannot feasibly be renovated or restored and that a replacement will be



required. Such replacement is proposed to occur independently of the proposed development of the ferry operation.

Efforts to identify the location, preservation and significance of archaeological resources in the project area have involved additional research in two areas. Historical research is concentrating on the identification of historic photographs of the terminal area which will supplement the information so far identified from historic maps. Aerial photographs from the 1940's and later have also been used to document the change and eventual decline of the site.

Archaeological research is progressing by stages. A series of 12 archaeological test pits were excavated by backhoe in early June. The pits were opened to examine the foundations of railroad buildings known to form historic maps. The tests revealed that some foundations were present, although preservation was uneven.

At the present time a geophysical survey has been initiated to supplement this information. Geophysical devices such as ground-penetrating radar and magnetometers can "see" under the ground and will give a clearer overall view of the state of preservation railroad era foundations.

### **Evaluation of Historic Properties**

While the whole project area falls within the historic district, not all the historic features within the district will be equally significant. Criteria are being developed to classify resources in terms of their importance based on age, integrity and function. For instance, well preserved features of the early Camden and Amboy period would certainly be considered significant.

### **Resolving Adverse Effects**

The main identified adverse effects will be on the current railroad bridge, which will be separately coordinated with the State, and possibly on early railroad features at the waterfront. It is intended to develop proposals for the bridge replacement that will entail recordation of the existing structure and the use of design elements in the new bridge which will be compatible with the old one and with the district as a whole. The features at the waterfront will be subjected to detailed survey and plans will be developed for further documentation and salvage of important items. As the significance of other archaeologically-surviving railroad features becomes clearer, it will be possible to develop treatment policies for these. These treatment policies may more intensive archaeological documentation, recordation during development, or possible adjustment to the design of the project if highly significant items are identified

# PROPOSED SOUTH AMBOY FERRY TERMINAL AND ACCESS ROAD



Source: Cunningham, John T. *Railroads in New Jersey*. 1997.

An 1850s woodcut showing the Camden and Amboy Railroad wharves in South Amboy, New Jersey.

## **For more information contact:**

Lauralee Rappleye-Marssett  
New Jersey Department of Transportation  
1035 Parkway Avenue, CN 600  
Trenton, NJ 08625

Phone: (609) 530-2990

**SECTION 106 OF THE  
NATIONAL HISTORIC PRESERVATION ACT OF 1966  
(AS AMENDED)**

## BACKGROUND

The National Historic Preservation Act of 1966 sets out procedures for ensuring that important historic properties are taken into account when federally-funded or authorized undertakings are planned.

The South Amboy Ferry Terminal Project falls under the provisions of Section 106 of the National Historic Preservation Act because part of the funding for the project comes from the Federal Highway Administration.

## WHAT IS SECTION 106?

Section 106 requires federal agencies to take into account the effect of any undertaking on historic properties (districts, sites, structures, buildings, or objects) that are included in or are eligible for the National Register of Historic Places. The National Register is the official list of the country's important historic properties. Properties can be determined to be "eligible" for the National Register before they have been formally entered onto it.

## THE SECTION 106 PROCESS

The way in which federal agencies' responsibilities are carried out is set out in federal regulation 36CFR Part 800: Protection of Historic Properties. Federal agencies are particularly required to "seek and consider the views of the public." There are several stages to the Section 106 process, and the following is a brief summary:

**1. Federal agency determines that the project (or "undertaking") falls under Section 106.**

**2. Consultation begins with the State Historic Preservation Office.** Other consulting parties are also identified and invited to participate. Public meetings like this one are part of the consultation process, as is defining the area of potential effect (APE).

The federal agency is responsible for defining the APE, reviewing existing information on historic properties, and seeking additional information on the location of historic properties. The APE is being defined through the use of maps

and visual analysis of the area around the proposed Ferry Terminal and Access Road.

**3. Historic properties are identified.** The South Amboy project is about to begin the identification stage of the Section 106 process. Currently:

- Background research has been undertaken on the project site, which has been determined to be eligible for the National Register as part of the Camden and Amboy Railroad Historic District. The site was the northern terminus of one of the first railroads in the United States, built in the 1830s.

- Archaeologists, historians, and architectural historians will undertake more research to find out if there are important physical remains of buildings or structures relating to the railroad or if there are historically important buildings near the project that might be affected by it.

**4. Historic properties are evaluated.** Not all historic properties are eligible for the National Register, and each property has to be evaluated against written criteria of significance. We already know that the historic district is eligible, but we don't yet know if there are individ-

ual properties that may also be eligible. This will be done through archaeological excavations and architectural surveys in the near future.

**5. The effects of the undertaking are assessed.** One important question we must ask is will the proposed Ferry Terminal Project adversely affect (i.e., harm or damage) properties on or eligible for the National Register? If the effects are adverse, the federal agency is responsible for resolving those effects. At this point, we do not know if the project will adversely affect any historic properties.

**6. Adverse effects are resolved.** If the project does have adverse effects on any historic properties, these must be resolved. The federal agency then consults with the State Historic Preservation Office and the other consulting parties to find alternatives to the undertaking which will avoid, minimize or mitigate the adverse effects. These can include redesign of the project or extensive documentation and research on historic properties that will be affected.

The ways in which adverse effects are to be dealt with are set out in a Memorandum of Agreement.

---

**APPENDIX F**  
**LIST OF PREPARERS**

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## **LIST OF PREPARERS**

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