DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

Río Puerto Nuevo Flood Control Project

San Juan, Puerto Rico

Bechara Material Management Area

U.S. Army Corps
of Engineers
Caribbean District

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FINDING OF NO SIGNIFICANT IMPACT

Río Puerto Nuevo Flood Control Project
San Juan, Puerto Rico

The U.S. Army Corps of Engineers, Caribbean District (Corps) has conducted a supplemental environmental analysis in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The final Supplemental Environmental Assessment (SEA) dated **DATE OF SEA**, for the Río Puerto Nuevo Flood Control Project in San Juan, Puerto Rico, updates and evaluates the potential effects of the project on the environment, focusing on the placement of materials to be generated during construction from the original considerations in the Project's Final Environmental Impact Statement (EIS) from October 1984.

The Final SEA, incorporated herein by reference, evaluated various alternatives for the placement of clean fill material generated from construction measures that would reduce flood risk and minimize damage to structures, contents, and transportation infrastructure within the Río Puerto Nuevo and Río Piedras watersheds. The Preferred Alternative, Alternative 4, includes the following proposed engineering refinements and design changes:

- Construction of an approximate 56-acre upland material management area for clean fill material with a placement capacity of 1.2 - 1.6 million cubic yards;

- Implementation of a wetland mitigation, associated monitoring and contingency plan in an in-kind and in-watershed mitigation area. The wetland mitigation will consist of about 10 acres of wetland restoration and 9 acres of wetland enhancement to offset 11.4 acres of wetland impacts. Mitigation monitoring and implementation of contingency measures will continue until the required mitigation has been determined to be successful based on the identified criteria within the Wetland Mitigation and Contingency Plan included in Appendix C. Monitoring is expected to last no more than 10 years.

In addition to a "no action" plan, five (5) alternatives were considered. The final array of alternatives for evaluation has the "no action" alternative along with two (2) additional ones: Alternative 3 (construction of a 60-acre upland material management area that impacts 15.6 acres of wetlands) and Alternative 4 (construction of a 56-acre upland material management area that impacts 11.4 acres of wetlands). A more detailed description of the Alternatives is in Section 2.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the Preferred Alternative, Alternative 4, are listed in Table 1.

Table 1: Summary of Potential Effects of the Preferred Alternative, Alternative 4.

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aquatic resources/wetlands	☐	☒	☐
Climatology	☒	☐	☐
Coastal Barrier Resources	☐	☐	☒
Essential Fish Habitat	☒	☐	☐
Fish and wildlife habitat	☒	☐	☐
Flood hazards	☒	☐	☐
Threatened/Endangered species/critical habitat	☒	☐	☐
Historic properties	☒	☐	☐
Other cultural resources	☒	☐	☐
Hazardous, toxic & radioactive waste	☒	☐	☐
Hydrology	☒	☐	☐
Land use	☒	☐	☐
Marine protected mammals	☒	☐	☐
Navigation	☐	☐	☒
Noise levels	☒	☐	☐
Recreational Resources	☒	☐	☐
Public infrastructure	☒	☐	☐
Socioeconomics	☒	☐	☐
Soils	☒	☐	☐
Tribal trust resources	☐	☐	☒
Vegetation	☒	☐	☐
Water quality	☒	☐	☐

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the Preferred Alternative. Best management practices (BMPs) as detailed in the SEA will be implemented, if appropriate, to minimize impacts. Specifically, measures such as implementing standard conservation measures to protect species, preventing erosion and sedimentation, and implementing procedural controls to prevent oil, fuel, or other hazardous substances from entering the air or water will be taken. Furthermore, to address wetland effects, a mitigation and contingency plan will be required, which will involve coordination with resource agencies to design and implement measures that minimize damage to wetland resources and achieve no net loss of wetlands, consistent with the national goal of no net loss of wetland resources.

The Preferred Alternative, Alternative 4 will result in unavoidable adverse impacts to 11.4 acres of degraded wetlands. To mitigate for these unavoidable adverse impacts, the Corps will ensure that the Wetland Mitigation and Contingency Plan (See Appendix C) is implemented in a manner that minimizes damage to wetland resources and promotes the long-term sustainability of these valuable ecosystems. The plan includes measures to prevent pollution and protect water quality, including the use of BMPs for stormwater management and the implementation of a spill prevention and response plan for hazardous substances related to construction equipment and supplies. Measures to protect and restore habitats, including the restoration of 10 acres and enhancement of 9 acres of wetland resources near the project area; these environmental actions will be performed within 5 years from the impacts to the 11.4 acres. The

plan also includes measures to protect air quality, by using clean fuels and the implementation of emission-reducing technologies. Lastly, the plan also includes a monitoring and enforcement program, that encompasses regular monitoring of environmental parameters and the implementation of corrective actions if any non-compliance is detected, to ensure that the mitigation measures are effective and that the project is implemented in accordance with the plan.

Public review of the draft SEA and Finding of No Significant Impact (FONSI) will be completed by **30 June 2025**. All comments submitted during the public review period will be responded to in the Final SEA and FONSI. A 30-day state and agency review of the Final SEA will be completed on **15 August 2025**.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the Preferred Alternative, Alternative 4 may affect, but is not likely to adversely affect (MANLAA) the following federally listed species or their designated critical habitat: the Puerto Rican boa (*Chilabothrus inornatus*) and the Antillean manatee (*Trichechus manatus manatus*). The U.S. Fish and Wildlife Service (FWS) concurred with the Corps' determination on **DATE OF CONCURRENCE LETTER**

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the Preferred Alternative, Alternative 4 will have no effect on the following federally listed species or their designated critical habitat: roseate tern (*Sterna dougallii dougallii*), queen conch (*Aliger gigas*) and palo de rosa (*Ottoschulzia rhodoxylon*).

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that the recommended plan has no potential to affect historic properties.

Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with section 404(b)(1) Guidelines (40 CFR § 230). The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix A - 404(b)(1) Evaluation of the SEA.

A water quality certification pursuant to section 401 of the Clean Water Act will be obtained from the Puerto Rico Department of Natural and Environmental Resources prior to construction. In a letter dated **DATE OF LETTER**, the Government of Puerto Rico stated that the Preferred Alternative appears to meet the requirements of the water quality certification, pending confirmation based on information to be developed during the pre-construction engineering and design phase. All conditions of the water quality certification will be implemented in order to minimize adverse impacts to water quality.

A determination of consistency with the Puerto Rico Coastal Zone Management program pursuant to the Coastal Zone Management Act of 1972 will be obtained from the Puerto Rico Planning Board prior to construction. In a letter dated **DATE OF LETTER**, the Government of Puerto Rico stated that the Preferred Alternative appears to be consistent with state Coastal Zone Management plans, pending confirmation based on information to be developed during the pre-construction engineering and design phase. All conditions of the consistency determination shall be implemented in order to minimize adverse impacts to the coastal zone.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed prior to finalizing this document.

Technical, environmental, economic, and cost effectiveness criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the Preferred Alternative would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____
Date

_____
Charles L. Decker, PMP
Colonel, U.S. Army Corps of Engineers
Caribbean District Commander

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San Juan, Puerto Rico

1 INTRODUCTION

1.1 INTRODUCTION

The Río Puerto Nuevo Flood Control (RPN) Project is a federally authorized project aimed at reducing flooding in the San Juan metropolitan area. The project was initiated in response to a 1978 request from the Governor of Puerto Rico (PR) to the U.S. Army Corps of Engineers (Corps) to conduct a study on flood mitigation measures for the Río Puerto Nuevo watershed. The watershed, which includes the Río Piedras, was experiencing high flows that damaged property and disrupted the functionality of adjacent areas, including the regional wastewater treatment plant.

The project, authorized under the Water Resources Development Act (WRDA) of 1986, involves approximately 11.2 miles of channel improvements to the existing river and its tributaries. The Puerto Rico Department of Natural and Environmental Resources (DNER) is the Non-Federal Sponsor (NFS) for the project. Upon completion, the project is expected to provide flood risk reduction up to the 100-year event, thereby protecting people, property, and the environment.

Construction on the project began in 1995 but was halted in 2012 due to funding constraints. During this period, several components were completed, including the Kennedy Bridge, 1.3 miles of Quebrada Margarita channel excavation, and various channel walls. The project remained incomplete until the Bipartisan Budget Act of 2018 (BBA 2018) (P.L. 115-123) provided funding and authority to proceed with the remaining work.

The outstanding project components have been dispensed into manageable contracts, which are in various stages of design. Some of those contracts have been recently reviewed and found to be in compliance with existing National Environmental Policy Act (NEPA) coverage (USACE 2025). The Corps is currently considering engineering design updates for contracts 4, 6, and 7. In the future, if the Corps decides to propose substantial changes to the project that area relevant to environmental concerns, they will be evaluated as appropriate in accordance with NEPA.

Currently, the Corps is focusing on identifying material management areas for the project, as the previously proposed sites are no longer available and/or practicable. This effort will involve a thorough evaluation of potential environmental impacts and compliance with relevant laws and regulations, including the Clean Water Act (CWA) and the Endangered Species Act (ESA). The identification of suitable new area for material management will

be conducted in accordance with Corps regulations and guidelines and will take into account environmental factors such as wetlands, water quality, and wildlife habitats.

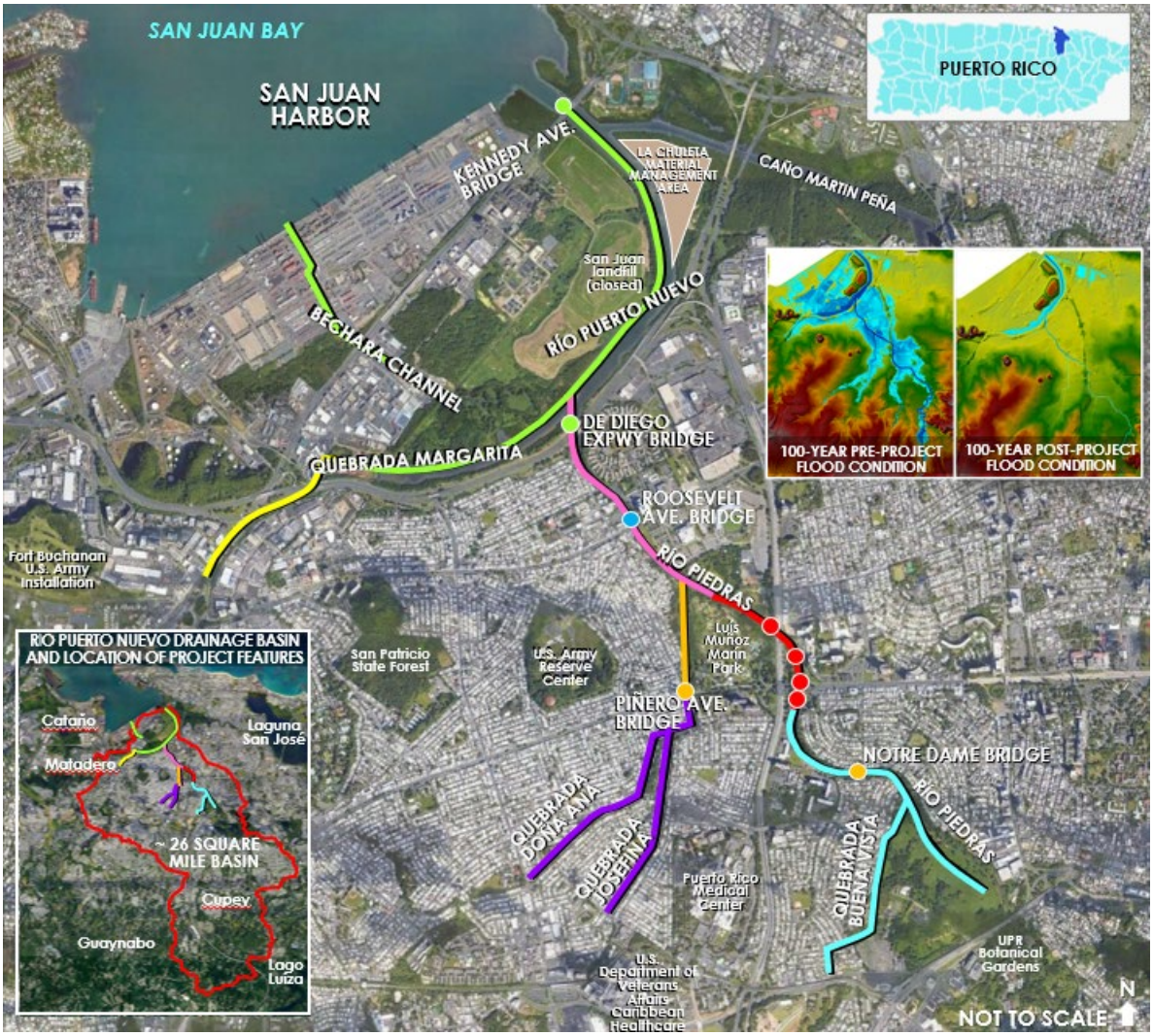

Figure 1-1. Río Puerto Nuevo Flood Control Project. Each colored line indicates a contract (CNT). Green and yellow are completed construction. Blue is CNT 2: Roosevelt bridge; Pink is CNT 3: Río Piedras channel; Red is CNT 4: Las Américas bridges; Orange is CNT 5A/B: Notre Dame and W. Pinero bridges; Light blue is CNT 6: Río Piedras and Buena Vista channels; Purple is CNT 7; Doña Ana and Josefina channels.

1.2 PROJECT AUTHORITY

Pursuant to Section 401(a) of the WRDA of 1986 (P.L. 99-662), Congress authorized the construction of the Río Puerto Nuevo Flood Control Project, which consists of flood control improvements to the Río Puerto Nuevo. The authorized project is described in the General Design Memorandum (GDM) dated December 1991. Design improvements are described in the Feature Design Memorandum (FDM) 1 dated November 1992 and the FDM 2 dated November 1999. The Corps validated that the project remains justified in the Continuing Construction Validation Report, Río Puerto Nuevo, Puerto Rico, dated March 2020.

The BBA 2018 (P.L. 115-123), enacted in February 2018, provides funding and authority for the Corps to address the impacts of natural disasters, with a focus on states affected by Hurricanes Harvey, Irma, and María. As part of this legislation, approximately $2.5 billion was appropriated for projects in PR, to be funded at full federal expense. Of this amount, $1.55 billion is allocated for the construction of the remaining portions of the Río Puerto Nuevo Flood Control Project.

1.3 PROJECT LOCATION

The Río Puerto Nuevo drainage basin is situated in the heart of the San Juan Metropolitan Area, along the north coast of PR, and extends southward to the foothills of the central mountains. The basin encompasses an area of approximately 26 square miles, primarily within a highly urbanized region that drains into the San Juan Bay. The river basin comprises the Río Puerto Nuevo, Río Piedras, and several major tributaries, including Quebrada Margarita, Bechara Canal, Quebrada Josefina, Quebrada Doña Ana, and Quebrada Buena Vista (See Figure 1-1 for a detailed illustration).

This Supplemental Environmental Assessment (SEA) will focus on the evaluation of a new potential material management area for the RPN Project. The current material management sites for the project include La Chuleta material management area (MMA) and an Ocean Dredged Material Disposal Site (ODMDS) (See Figure 3-2). Previously the material was to be taken to the ODMDS. However, permitting requirements for disposal at the ODMDS, as of the time of writing this document, limits the material that can be placed there, and La Chuleta MMA does not have the capacity to manage that additional amount of material. In view of these circumstances, an additional site is being proposed for material management. An evaluation of this new site will determine its suitability for material management and potential environmental impacts, as well as their compliance with relevant laws and regulations. The assessment will provide a comprehensive analysis of the potential effects of using a proposed new site, including any potential benefits or drawbacks, and will inform the selection of the most suitable material management strategy for the project.

1.4 PROJECT BACKGROUND AND HISTORY

The construction of the RPN Project was initially authorized by Congress in 1986 for flood control improvements to the Río Puerto Nuevo. Prior to this authorization, an Environmental Impact Statement (EIS) was completed in 1984 to assess the potential impacts of the proposed project under the NEPA. A GDM was subsequently developed, dated December 1991, and revised in April 1992. The GDM was approved by the ASA(CW) on September 4, 1992.

Following the approval of the GDM, an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) were conducted to evaluate the changes incorporated into the GDM. In 2002, an additional EA and FONSI were completed, which assessed changes to the project design, including the construction of a drainage canal through the Bechara Industrial Area and a box culvert under the Río Puerto Nuevo port facilities, as well as the realignment of the Margarita levee.

Initial construction on the project began in 1995 but was halted in 2012 due to funding constraints. The impact of Hurricane María, which made landfall on September 20, 2017, as a Category 4 storm, was significant. The storm's excessive rainfall caused increased flow in the Río Puerto Nuevo, resulting in substantial sediment suspension in upstream areas. Although no flood damage was observed above the waterline in the completed project areas, hydrographic surveys revealed that the eroded sediment settled out in the channel downstream of the De Diego Bridges, affecting both the Río Puerto Nuevo and Margarita channels.

1.5 RELEVANT ISSUES

This SEA builds upon the previous NEPA documents listed below. It evaluates whether changes in the current project scope, new circumstances not previously analyzed, and newly available information contribute to a determination of significantly different environmental effects. The following issues have been identified as relevant and warrant further evaluation: requirement of additional material management areas with a capacity over 1 million cubic yards (cy).

1.5.1 RELATED ENVIRONMENTAL DOCUMENTS

The following NEPA documents are related to the project and are available for download on the Corps' environmental documents website[1], unless otherwise noted:

- Río Puerto Nuevo Survey Report and Environmental Impact Statement, San Juan, PR (October 1984): This initial project study evaluated the project plans under NEPA and presented both structural and non-structural alternatives.
- General Design Memorandum and Environmental Assessment, Río Puerto Nuevo, Puerto Rico (1993): A signed FONSI documented refinements to the project design.
- Environmental Assessment and Finding of No Significant Impact, Flood Control Features for Bechara Industrial Area, Río Puerto Nuevo Flood Control Project, San Juan/Guaynabo, Puerto Rico (January 2002): A FONSI was signed on March 29, 2002, for design changes that included the construction of a drainage canal through the Bechara Industrial Area.

1.6 PURPOSE AND NEED

The primary objective of the authorized RPN Project is to enhance human health and safety, while also providing additional economic benefits, such as recreation and

[1] https://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/

redevelopment opportunities, by reducing flood risk and minimizing damage to structures, contents, and transportation infrastructure within the basin. In achieving this primary objective, the need was identified for an additional material management area, which is the purpose and need for this SEA.

The rapid development within the watershed has resulted in significant soil impermeability, leading to frequent and severe flooding that poses a threat to life, property, public buildings, roads, and commercial facilities. As the project design undergoes refinements, it is essential to evaluate the potential environmental impacts of the project under the NEPA. This SEA examines the potential effects of the project on the environment, focusing on the placement of materials generated during construction.

The 1992 GDM proposed disposing of all material in the ODMDS. Current regulations permit the disposal of only suitable dredged material from Waters of the United States, in the ODMDS. This limits the amount of material that can be placed there. La Chuleta MMA, added to the project in 2022 with a capacity of approximately 346,000 cubic yards (cy), lacks the capacity to manage the amount of material to be generated by the construction. To address this need, a new potential material management site with a capacity between 1.2 and 1.6 million cy is required. The Corps has considered multiple opportunities and has identified alternatives for evaluation, located near the Río Puerto Nuevo (See Figure 2-1). This SEA will assess the feasibility and potential environmental impacts of utilizing these alternatives for material management, including the potential effects on water quality, air quality, and wildlife habitats.

The Corps will determine the viability of utilizing one of the alternatives based on the findings of this SEA. If no significant effects on the human and natural environment are identified, the Corps will sign the FONSI and proceed with the Preferred Alternative. However, if significant effects are detected, the Corps will consider implementing mitigation measures to reduce the effects to a less-than-significant level, prepare a Notice of Intent to develop an EIS, or opt not to implement the Preferred Alternative.

1.7 PUBLIC INTEREST FACTORS

Although the Corps does not issue permits for its own activities, it evaluates its own discharges of dredged or fill material in accordance with 33 CFR § 336.1. This process involves applying all applicable substantive legal requirements, including public notice and opportunity for public hearing. As part of its review, the Corps evaluates the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. All relevant factors must be considered, including their cumulative effects.

The following factors are considered in the Corps' evaluation:

- Natural Environment:
    - Wetlands
    - Vegetation
    - Threatened and Endangered Species

  - Fish and Wildlife Communities
  - Essential Fish Habitat
  - Marine Protected Mammals
  - Coastal Barrier Resources
  - Water Quality
  - Air Quality
  - Noise
  - Hazardous, Toxic, and Radioactive Waste
  - Climatology

- Human Environment:
  - Cultural Resources
  - Aesthetics
  - Recreation
  - Flood Hazards
  - Socioeconomics

The following factors were considered but determined to be not applicable to this project:

- Energy Needs
- Conservation
- Flood Plain Values
- Land Use
- Water Supply and Conservation
- Food and Fiber Production
- Shore Erosion and Accretion

Based on the analysis provided in Section 4 of this SEA, the Corps concludes that the proposed activity is in the public interest.

2 ALTERNATIVES

This section outlines the No Action Alternative and other reasonable alternatives that were considered and either evaluated in detail or eliminated from further analysis. The environmental benefits and drawbacks of each alternative are presented in a comparative format. A more detailed comparison of the alternatives is provided in Section 4 (Environmental Effects), which offers a clear basis for decision-making.

2.1 DESCRIPTION OF ALTERNATIVES

This section describes the alternatives considered for the project, including the No Action Alternative and five (5) Alternatives. The alternatives are evaluated based on their potential environmental impacts and their ability to meet the project's objectives.

2.1.1 ALTERNATIVE 1: NO ACTION (STATUS QUO): ODMDS AND LA CHULETA MMA

The No Action Alternative would result in the RPN Project only using the existing material management sites, the ODMDS and La Chuleta MMA. Placement of material in the ODMDS would be limited to only suitable dredged material and La Chuleta MMA would be limited to its designed capacity of approximately 346,000 cy. The ODMDS is located about 2.2 nautical miles north of the San Juan Harbor entrance and La Chuleta MMA is an undeveloped area located east of road PR-22 and northeast from the closed San Juan landfill (See Figure 3-2).

2.1.2 ALTERNATIVE 2: KENNEDY MATERIAL MANAGEMENT AREA

Alternative 2 involves the use of the Kennedy MMA with the ODMDS and La Chuleta MMA being used as needed. The Kennedy MMA is vegetated area located in the corner where the Bechara Channel flows under the John F. Kennedy Expressway (See Figure 2-1). The site will be cleared of all vegetation, and clean fill material will be brought to the site to be placed. The site would be designed for a placement capacity of 1.2 – 1.6 million cy and it would be filled to an elevation and with side slopes determined by a geotechnical analysis. A perimeter ditch will be constructed around the entire site to collect surface drainage runoff, and the drainage design will include measures to control erosion and sedimentation, such as geotextiles, riprap, or vegetative stabilization. The perimeter ditch will be designed to convey runoff to the Bechara Channel, while minimizing the risk of erosion and sedimentation.

To prevent erosion and sedimentation during construction and after material placement, the site will be constructed and managed with measures to control sedimentation, including the use of silt fences, sediment basins, and other BMPs. The plan will include measures to control invasive species, maintain soil health, and monitor and maintain water quality through regular sampling and testing. After material placement has been completed, the site will be seeded and/or planted with native vegetation and transferred back to the landowner/s.

2.1.3 ALTERNATIVE 3: BECHARA A MATERIAL MANAGEMENT AREA

Alternative 3 involves the use of the Bechara A MMA with the ODMDS and La Chuleta MMA being used as needed. The Bechara A MMA is an approximately 60 acres undeveloped area located west of the closed San Juan landfill and east of the J.F.K. Expressway (See Figure 2-1). The area includes an upland and wetland area. The upland part is directly northeast of a junkyard and southwest of a water treatment plant, and includes approximately 15.6 acres of jurisdictional wetlands that are across the dirt road that divides that undeveloped area (See Figure 3-1). Just like in the previous alternative, the site will be prepared for material placement of about 1.2 – 1.6 million cy by clearing vegetation, placing clean material, and filling to a determined elevation with side slopes based on a geotechnical stability analysis. To prevent erosion and sedimentation, measures such as silt fences, sediment basins, and other BMPs will be implemented along the perimeter ditch conveying runoff to the Bechara Channel. After material placement has been completed, the site will be seeded and/or planted with native vegetation and transferred back to the landowner.

2.1.4 ALTERNATIVE 4: BECHARA B MATERIAL MANAGEMENT AREA

Alternative 4 involves the use of the Bechara B MMA with the ODMDS and La Chuleta MMA being used as needed. Bechara B is within the Bechara A area with approximately 56 acres (See Figure 2-1). It excludes 4.2 acres from the approximate 15.6 acres jurisdictional wetlands in Alternative 3, and just like in Alternative 2, the site will be prepared for material placement of about 1.2 – 1.6 million cy by clearing vegetation, placing clean material, and filling to a determined elevation with side slopes based on a geotechnical analysis. To prevent erosion and sedimentation, measures such as silt fences, sediment basins, and other BMPs will be implemented along the perimeter ditch conveying runoff to the Bechara Channel. After material placement has been completed, the site will be seeded and/or planted with native vegetation and transferred back to the landowner.

2.1.5 ALTERNATIVE 5: BECHARA C MATERIAL MANAGEMENT AREA

Alternative 5 involves the use of the Bechara C MMA with the ODMDS and La Chuleta MMA being used as needed. Bechara C is in the same general area as the Alternative 3, Bechara A MMA. It excludes the wetland area but adds the upland portions southeast to it and southwest of the closed landfill (See Figure 2-1). Also, just like in Alternative 2, the site will be prepared for material placement of about 1.2 – 1.6 million cy by clearing vegetation, placing clean material, and filling to a determined elevation with side slopes based on a geotechnical analysis. To prevent erosion and sedimentation, measures such as silt fences, sediment basins, and other BMPs will be implemented along the perimeter ditch conveying runoff to the Bechara Channel. After material placement has been complete, the site will be seeded and/or planted with native vegetation and transferred back to the landowner.

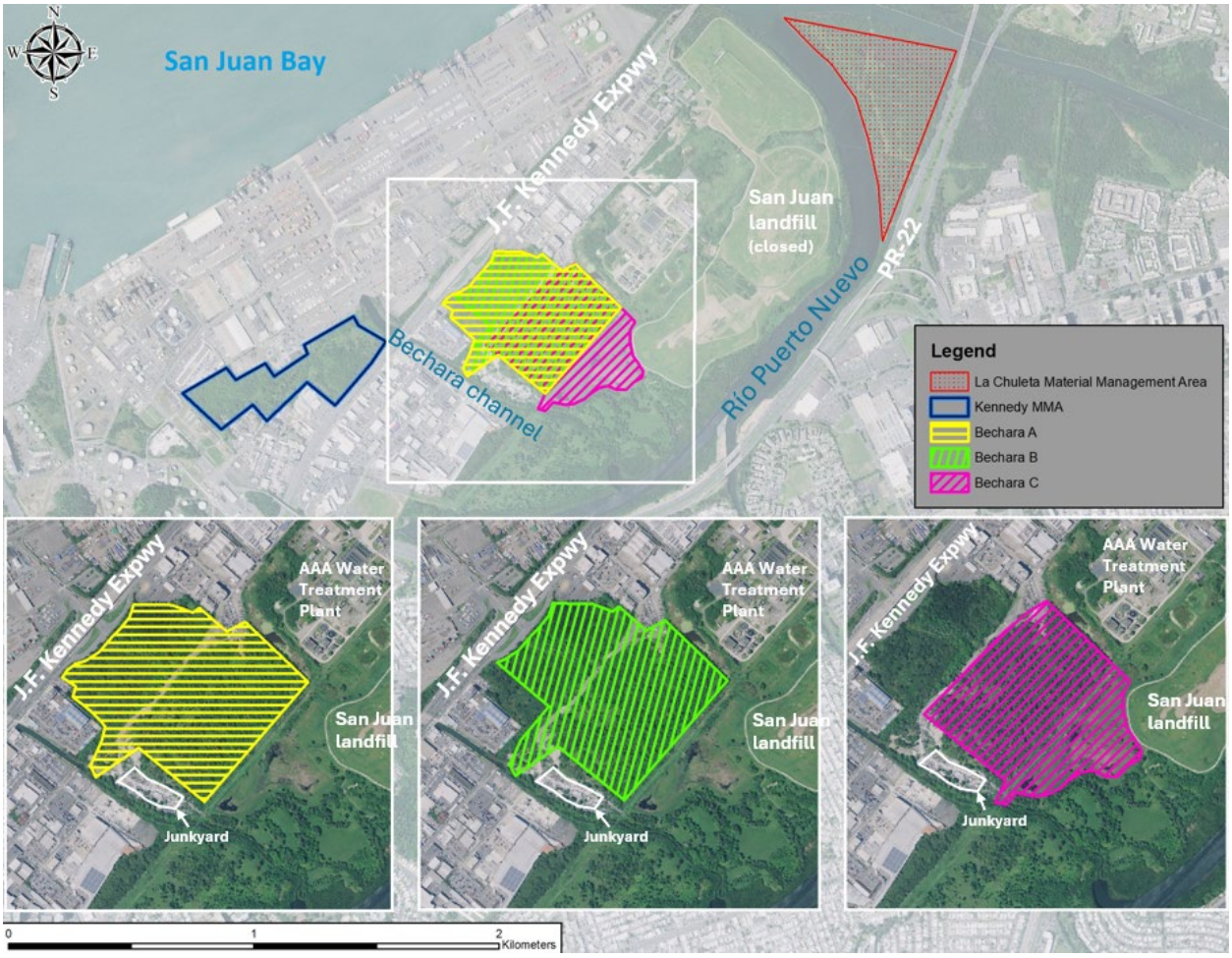

Figure 2-1. Existing MMA, La Chuleta MMA (Red) and MMA Alternatives being evaluated for the RPN Project: Alternative 2-Kennedy (Blue), Alternative 3-Bechara A (Yellow), Alternative 4-Bechara B (Green), Alternative 5-Bechara C (Pink).

2.1.6 ALTERNATIVE 6: LANDFILLS

Alternative 6 involves the use of upland landfills for material management. This alternative would require the transportation of 1.2 – 1.6 million cy of material to nearby landfills. The use of landfills would involve the transport of material by truckload. Under this alternative the ODMDS and La Chuleta MMA would still be used as needed.

2.2 CONSIDERATIONS ELIMINATED FROM DETAILED EVALUATION

Alternative 2, which involves the use of the Kennedy MMA, was eliminated from detailed evaluation due to its potential to induce flooding in nearby areas. The area is considered floodwater retention area, and filling the site with material would compromise its ability to retain floodwater, thereby increasing the risk of flooding in adjacent neighborhoods. In addition, the geometry of the site presents potential construction complications such as designing a perimeter ditch without constraining space availability for placement of material. These concerns, combined with the potential environmental and social impacts

associated with increased flooding, led to the elimination of Alternative 2 from further consideration.

Alternative 5, which involves the use of the Bechara C MMA, was eliminated from detailed evaluation due to the presence of power lines that run through the middle of the site. Relocating the power lines and the required easement area pose significant constraints in design and construction. Retaining the power lines in place effectively divides the area into smaller separate management areas. This increases costs, and reduces material placement capacity, falling short of the required 1.2 - 1.6 million cy MMA capacity. Due to these factors Alternative 5 was eliminated from further consideration.

Alternative 6, which involved the use of landfills for material management, was eliminated from detailed evaluation due to several factors. The San Juan landfills were removed from consideration due to their current full capacity, while other landfills near the San Juan area, such as Toa Baja and Carolina, were deemed non-viable due to limited capacities, environmental concerns, and health risks, with expected closures by 2030 (EPA 2024c). Additionally, other landfills in PR have had closure orders or are at/near capacity. The Humacao landfill on the southeast part of the Island, although available, is not practicable due to considerable distance (approximately 34 miles) from the project site and consequential increase in environmental impacts. The environmental impacts would significantly increase due to the irreversible commitment of resources like gasoline, diesel fuel, and oil for equipment and transportation, and would substantially worsen air quality due to increased fuel combustion. Impacts to transportation roadways would be expected. In addition, the cost estimates for transporting 1.2 - 1.6 million cy of material to the Humacao landfill are about 2.7 times more than constructing, servicing, operating and transporting the material to a Kennedy/Bechara management area. As a result, landfills were eliminated from detailed evaluation as a material management alternative.

2.3 FINAL ARRAY OF ALTERNATIVES

Alternatives being carried forward include Alternatives 1 (No Action (Status quo): ODMDS and La Chuleta MMA), Alternative 3 (Bechara A MMA) and Alternative 4 (Bechara B MMA). Section 4 (Environmental Effects) compares the alternatives in more detail, providing a clear basis for choice to the decision maker and the public.

3 AFFECTED ENVIRONMENT

This section provides an overview of the existing environmental resources that could be affected if any of the alternatives, other than the No Action alternative, would be implemented. The affected environment is described in terms of the human and natural environment. It does not describe the entire existing environment, but only those environmental resources that would be affected by the alternatives if they were implemented. By establishing a baseline of the current environmental conditions, this section provides the foundation for assessing the potential environmental effects of the proposed action and its reasonable alternatives.

The environmental resources that would be affected with the Alternative1: No Action (Status quo): ODMDS and La Chuleta MMA) were not included as these have been addressed, described and assessed in previous environmental documents. For more detailed information and access to these documents visit the Corps' environmental documents website[2] (USACE 2025).

3.1 NATURAL ENVIRONMENT

3.1.1 WETLANDS

The Río Puerto Nuevo basin, located in north central PR, has a diverse range of land uses, from highly urbanized and residential areas to undeveloped upland forests. Within the San Juan Metropolitan area, few natural wetlands remain. The basin encompasses an area of approximately 26 square miles, primarily within a highly urbanized region that drains into the San Juan Bay.

Two (2) potential material management sites are being considered for the project: the Bechara A MMA and Bechara B MMA sites. A wetland delineation was completed in 2023 in the Bechara B site to assess potential wetland impacts (See Appendix D). The Bechara site is bordered by roadways, electric power transmission lines, an industrial park, a water treatment plant, a retired municipal landfill, and the Bechara channel (See Figure 2-1). The site is divided by a gravel road into an upland fill area and a mostly divided wetland, characterized as an estuarine wetland. However, this wetland has been degraded with trash material and it’s surrounded with fill composed of concrete rubble, rocks, soil, home demolition debris, and other trash.

In the Bechara site, the wetland area (approximately 15.6 acres), which is located between the J.F Kennedy Expressway and the gravel road, has a connection to the Bechara channel through a narrow swale/ditch between the junkyard and the car

[2] https://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/

dealership (See Figure 3-1). Smaller no-jurisdictional wetlands were identified in the Bechara site in wetland surveys performed in June 2023 (See Appendix D- Wetland Jurisdictional Determination Delineation report). These smaller wetlands, that total about 0.88 acres, lack the hydrological connection for a wetland jurisdictional determination.

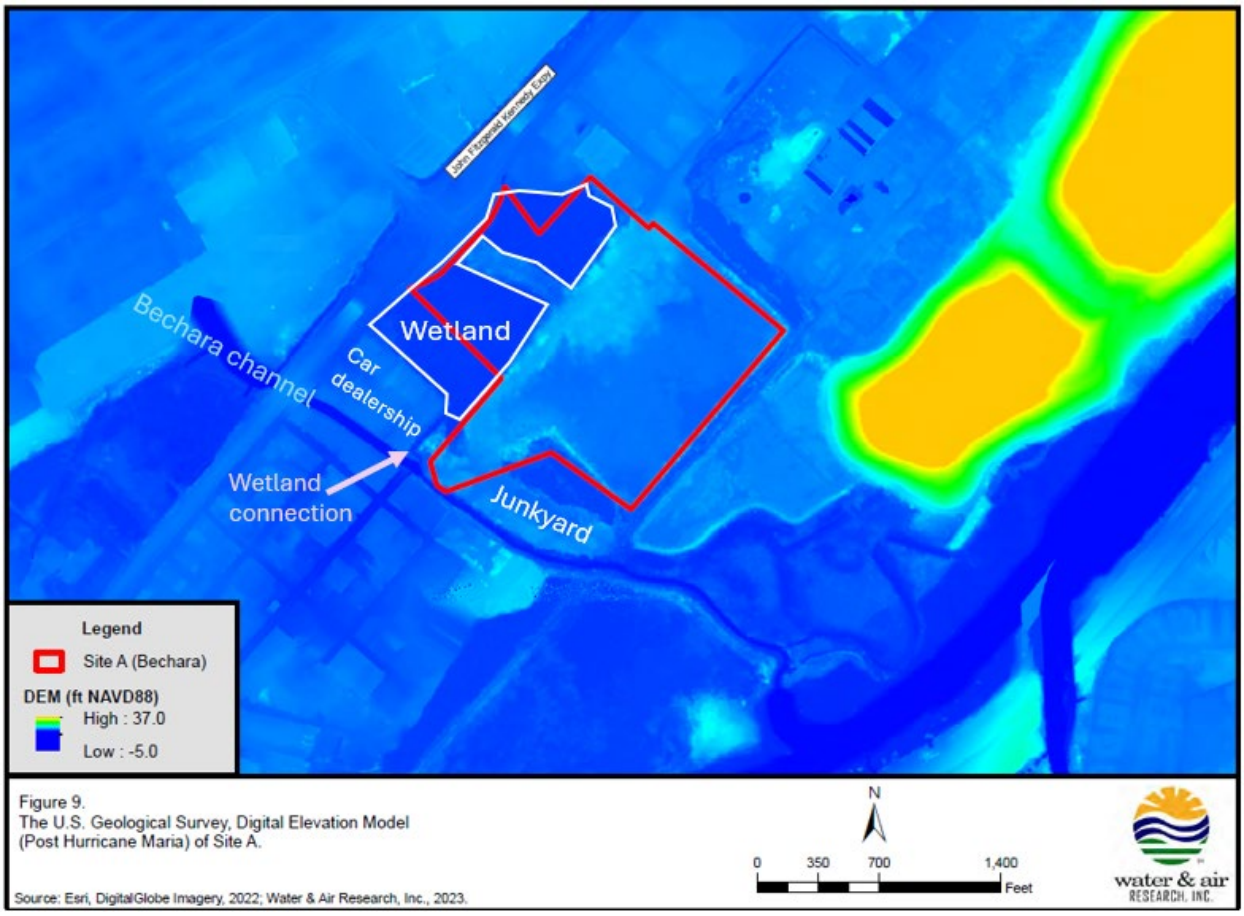

Figure 3-1. Wetland connection to the Bechara channel (Water & Air Research, Inc. 2023) (Original figure altered to depict wetland connection and surrounding features).

3.1.2 VEGETATION

The vegetation at the Bechara B site is characterized by a diverse range of plant species. A recent flora survey (Water & Air Research, Inc. 2023) identified 85 plant species at the Bechara site, with 49% being native to PR. The dominant vegetation types at Bechara include upland forests, saltwater swamp wetlands, and freshwater marsh wetlands. The upland forests are dominated by tree species such as tall albizia (*Albizia procera),* lead tree (*Leucaena leucocephala),* and almond tree (*Terminalia catappa)*, while the saltwater swamp wetlands are characterized by species like black mangrove (*Avicennia germinans),* white mangrove *(Laguncularia racemosa),* and portiatree (*Thespesia populnea)*.

The flora surveys also identified a significant presence of invasive exotic species at the site, with approximately 32 percent of the plant species at Bechara being considered invasive. The most common invasive species at Bechara include napier grass (*Pennisetum purpureum),* ground cherry (*Physalis angulata),* and castor bean (*Ricinus communis)*.

The vegetation at the site provides important ecosystem services, including habitat for wildlife, soil stabilization, and water filtration. However, the presence of invasive exotic species poses a threat to the native vegetation and ecosystem processes.

3.1.3 THREATENED AND ENDANGERED SPECIES

The Corps has previously consulted with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) on the RPN Project, regarding threatened and endangered species listed under the ESA. These species included the yellow-shouldered blackbird, brown pelican (de-listed), sea turtles (Green, Hawksbill, and Leatherback), whales (Humpback, Blue, Finback, Sei, and Sperm), the Puerto Rican boa, corals, and the Antillean manatee.

The Corps updated consultation with the USFWS and NMFS in 2013 and 2014, respectively, to address potential ESA concerns. The Corps has proposed implementation of conservation measures and has concluded that the RPN Project may affect, but not likely to adversely affect (MANLAA), the Antillean manatee, sea turtles, whales, and corals. The Site Management and Monitoring Plan (SMMP) for PR Dredged Material Disposal Sites includes ESA Section 7 consultation for the transport of dredged materials to the ODMDS (EPA and USACE SMMP 2023). It includes determinations for the Nassau grouper, giant manta ray, oceanic whitetip shark, scalloped hammerhead shark and newly designated critical habitat for listed corals in PR, (EPA and USACE SMMP 2023).

TABLE 1. FEDERALLY LISTED T&E SPECIES THAT HAVE BEEN PREVIOUSLY CONSULTED ON FOR THE RPN PROJECT.

Species	Status	Coordinating agency	Past Project Consultation Date(s)	Effect Determination
Yellow shouldered blackbird	Endangered	USFWS	1991, 2013	No Effect (NE)
Brown pelican	De-listed	USFWS	1991	NE
Sea turtles (Green, Hawksbill, Loggerhead, Kemp's Ridley and Leatherback)	Threatened and Endangered	USFWS & NMFS	1992, 2013, 2002, 2010, 2014, 2023 SMMP	MANLAA
Whales (Humpback, blue, finback, Sei, Sperm)	Endangered	USFWS & NMFS	2010, 2014, 2013, 2023 SMMP	MANLAA
Puerto Rican boa	Endangered	USFWS	2013	MANLAA

Corals and DCH	Threatened	NMFS	2010, 2014, 2023 SMMP	MANLAA
Antillean manatee	Threatened	USFWS	2013	MANLAA
Nassau grouper	Threatened	NMFS	2023 SMMP	MANLAA
Oceanic whitetip shark	Threatened	NMFS	2023 SMMP	MANLAA
Giant manta ray	Threatened	NMFS	2023 SMMP	MANLAA
Scalloped hammerhead shark	Endangered	NMFS	2023 SMMP	MANLAA

The list of threatened and endangered (T&E) species developed for this SEA were compiled from USFWS Information for Planning and Consultation (IPaC) official species list (see Appendix F) and the NMFS Endangered Species Act Section 7 Mapper (NMFS 2024).

TABLE 2. ENDANGERED SPECIES THAT HAVE THE POTENTIAL TO OCCUR WITHIN THE PROJECT AREA, THAT MAY NEED A NEW CONSULTATION OR UPDATED CONSULTATION.

Common Name	Scientific Name	Federal Status	Agency
Birds			
Roseate tern	*Sterna dougallii dougallii*	Threatened	USFWS
Mammals			
Antillean manatee	*Trichechus manatus manatus*	Endangered	USFWS
Mollusk			
Queen conch	*Aliger gigas*	Threatened	NMFS
Plants			
Palo de rosa	*Ottoschulzia rhodoxylon*	Threatened	USFWS
Reptiles			
Puerto Rican boa	*Chilabothrus inornatus*	Endangered	USFWS

Roseate tern

The roseate tern (*Sterna dougallii dougallii*) is a bird species listed as threatened under the ESA. As a migratory bird, it arrives at breeding areas in PR and the U.S. Virgin Islands (USVI) in April and departs by October (pers. comm with USFWS October 11, 2022). The species primarily nests on small cays or islets with rocky, grassy, coral rubble, or sand substrates, with documented breeding sites in PR limited to remote

areas in the southwest of the island, including Cayo El Palo, Cayo Media Luna, Cayo Turrumote, in the east of some Cays surrounding Culebra Island, and in Vieques Island (USFWS 2010 - 5yr Review). While not nesting, the roseate tern can be observed in mixed flocks of seabirds, feeding, and loafing in bays, shorelines, or open ocean.

The primary causes of nesting mortality for the roseate tern are predation and abandonment, followed by large storms. Given the species' specific breeding and nesting habits, the likelihood of encountering the roseate tern in areas outside of its documented breeding sites is low. In the case of the Bechara area, the roseate tern is unlikely to be present, as these areas do not match the species' preferred breeding and nesting habitats. Although the project area is within the range of the Caribbean population of the roseate tern, the Corps has determined that it is unlikely that the species will occur in the project area, and therefore, the project would have no effect on the roseate tern. This conclusion is supported by the fact that sightings of the roseate tern in the area are rare, with only one documented sighting in October 2023 in Paseo de la Princesa, northern San Juan Harbor, which is outside of the Bechara area.

In the context of NEPA, the roseate tern has no designated critical habitat and it presence in the Bechara area is considered unlikely, and therefore, the species is not expected to be affected by the project in this area.

Antillean manatee

The Antillean manatee (*Trichechus manatus manatus*) is a subspecies of the West Indian manatee, listed as Endangered under the ESA.

The Antillean manatee is found in the warm, shallow waters of the Caribbean Sea, including PR, and can be encountered in a variety of habitats, including mangrove forests, seagrass beds, and coral reefs. As an herbivore, the manatee feeds on seagrasses, algae, and other aquatic vegetation, and can grow up to 13 feet in length and weigh up to 1,300 pounds. The species is vulnerable to a range of threats, including habitat loss, entanglement in fishing gear, and collisions with boats. Steps would be taken to minimize or mitigate impacts to the species. This includes ensuring that any proposed in-water work actions do not harm or harass manatees, and that measures are taken to protect and conserve their habitats.

In the context of the project area of the Bechara site, the likelihood of affecting the Antillean manatee is considered low. The project area is not located in a known manatee habitat. Additionally, the project activities are not expected to result in significant disturbances to the marine environment, such as increased boat traffic or habitat destruction, that could potentially harm or harass manatees. However, as a precautionary measure, the project will still consider the potential for manatees to be present in manatee accessible water areas during in-water work construction. To minimize any potential impacts, the project could implement conservation measures such as instructing construction personnel on the presence of manatees and the importance of avoiding collisions, as well as implementing protocols for surveying the work area for manatees and avoiding entanglement in siltation barriers.

Designated critical habitat for the Antillean manatee is outside the Bechara area. The Condado Lagoon and the Boca Vieja cove are the closest designated critical habitat areas (See Figure 3-2). Activities related to Bechara will have no effects on designated critical habitat for the Antillean manatee.

Queen conch

The queen conch (*Aliger gigas*) is a large, slow-moving marine mollusk that is listed as a threatened species under the ESA. It can grow up to 12 inches in length and live up to 30 years, making it one of the longest-living invertebrates in the ocean. queen conchs are found in warm, shallow waters in the Caribbean Sea, typically inhabiting seagrass beds, coral reefs, and rocky crevices. They are herbivores, feeding on algae and seagrasses, and play an important role in maintaining the balance of their ecosystems. The queen conch is a significant species in the marine ecosystem, and its decline is a concern due to overfishing, habitat loss, and other human impacts.

The queen conch has no designated critical habitat and it is unlikely to be present in the Bechara area, which is primarily a mangrove habitat dominated by black and white mangroves, that are further upland and at a higher elevation than the red mangroves. While mangroves can provide important habitat for a variety of marine species, they are not typically associated with queen conch populations. The queen conch prefers seagrass beds, coral reefs, and other habitats with abundant algae and seagrasses, which are not characteristics of the Bechara area. The Bechara area is not suitable habitat for queen conch, therefore, it is very unlikely for queen conch to be present in the proposed project area. This project has no effects on the species or its habitat.

Palo de rosa

The palo de rosa (*Ottoschulzia rhodoxylon*) is a small evergreen tree that is native to PR. Its biology is characterized by its limited distribution and rarity, making it a unique and fascinating species. The palo de rosa is typically found in forests with high precipitation, well-drained soil, and a moderate to high level of sunlight conditions, which are essential for its survival.

In terms of its range, the palo de rosa is known to occur in the western part of PR, specifically in the Maricao, Guánica, Susúa, and Cambalache Commonwealth Forests. These forests provide the necessary habitat characteristics for the species to thrive, including high levels of rainfall and unique soil conditions.

Given the specific habitat requirements of the palo de rosa, it is unlikely to be present in the Bechara area. This is because the Bechara area has different habitat characteristics, such poorly drained soils, and varying levels of sunlight, which are not suitable for the palo de rosa. Additionally, the palo de rosa is typically found in areas with a specific set of associated species, and the Bechara area may not have the same composition of species, further reducing the likelihood of the palo de rosa being present. Overall, the unique biology and specific habitat requirements of the palo de rosa make it

unlikely to be found in areas that do not match its known range and habitat characteristics. This project will not have effects on the species or its habitat.

Puerto Rican boa

The Puerto Rican boa (*Chilabothrus inornatus*) is an endangered reptile species that inhabits a diverse range of terrestrial and arboreal habitats in PR. As a habitat generalist, the species can be found in various environments, including rocky areas, forests, plantations, and even urban and rural areas. They are known to thrive in areas with dense vegetation, such as karst and mangrove forests, and are often found near cave entrances, where they prey on bats. Puerto Rican boas are primarily arboreal, spending most of their time in trees, and can grow up to two meters in length, with a lifespan of 20 to 30 years.

The species is most commonly found in the northwestern karst region of PR, where the unique landscape dominated by soluble rock leads to the formation of caves and sinkholes. However, they can also be found in rainforests and plantations, and are capable of swimming and slithering over the ground. The Puerto Rican boas prefer habitats with large vegetation clumps, canopy cover, litter depth, and woody material, as well as areas with large trees and forest landcover (USFWS 2022). While it is possible that the species may be present in the project area, it is likely to be an uncommon occurrence, as the project area of Bechara site is within a highly developed urban areas and the species tend to avoid urban and grassland landcover.

In the context of NEPA, the Puerto Rican boa has no designated critical habitat, and therefore there's no designated critical habitat that would be affected in the project area. However, considering its potential presence in the project area, measures will be incorporated into the proposed action to minimize any potential impacts to the species. These measures would include informing project personnel about the potential presence of boas, marking project boundaries to avoid habitat degradation, and conducting surveys to detect boas before construction activities. Additionally, inspecting debris piles for boas can help minimize the risk of casualties. If a boa is found, activities should stop, and the boa should not be captured or relocated unless by permitted individuals or authorized personnel. By implementing these conservation measures, the project can reduce the risk of affecting Puerto Rican boas and ensure compliance with relevant laws and regulations, including the ESA.

3.1.4 FISH AND OTHER WILDLIFE COMMUNITIES (OTHER THAN T&E SPECIES)

The project area, located within San Juan, is home to a diverse range of fish and wildlife species. The nearby waters and wetlands support a variety of bird species, including shorebirds, cormorants, pigeons, ducks, herons, geese, and gulls. Although the project area is unlikely to provide habitat for birds protected under the Migratory Bird Treaty Act, as indicated by the USFWS IPaC (2025), several bird species were documented during surveys at the potential project site.

Mammals found on the island include bats and rats. The community has expressed concern for the *Palaemon pandliformis*, also known as the grass shrimp or potitina

shrimp, which was reported to be abundant in the river in 2008 (Lugo et al. 2011). The grass shrimp is a small, clear species that serves as a detritivore and is highly abundant in Caribbean rivers and estuaries. As an indicator species, its presence suggests good water quality in the estuarine system.

Fauna surveys conducted at the potential project site (Water and Air Research, Inc. 2023; Appendix D) documented eight amphibian species at Bechara. The majority of the documented amphibians at Bechara (57%) are native to PR. However, non-native species, such as the bullfrog (*Rana catesbeiana*) and pig frog (*R. grylio*), were also detected.

The project area's channel, with low water flow and a channel bottom above the tide line, is unlikely to provide preferred habitat for fish species due to the lack of consistent flow from the main channel and limited shallow water habitat. The absence of a hydraulic connection to the main channel also restricts species movement past this location.

A total of 35 bird species were documented at the Bechara site, with 86% of the species identified at Bechara being native to PR. Evidence of breeding activity was observed for eight bird species at Bechara. While no species protected under the Migratory Bird Treaty Act were identified, the Puerto Rican oriole (*Icterus portoricensis*) is listed as a species of conservation concern by the USFWS (2021).

Only three mammal species were observed at the project sites: the velvety free-tailed bat (*Molossus molossus*), rats, and a feral dog. Non-native reptile species, including the green iguana (*Iguana iguana*) and red-eared slider (*Trachemys scripta elegans*), were also observed. Although no spectacled caimans (*Caiman crocodilus*) were observed during the surveys, residents and a groundskeeper reported encounters with this non-native species within or near the on-site wetlands. A documented sighting of a spectacled caiman on the Río Piedras (iNaturalist 2022), which is hydrologically connected to both sites, suggests the potential presence of this species in the area.

3.1.5 ESSENTIAL FISH HABITAT

This section describes the existing conditions of Essential Fish Habitat (EFH) within the Bechara area in San Juan. EFH is defined as those waters and substrate necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires federal agencies to consult with the NMFS for activities that may affect EFH.

The NMFS and the Caribbean Fisheries Management Council (CFMC) oversee the managed species and their habitats that may be present within the project area. The data from NMFS EFH Mapper intersects with the Bechara channel area as EFH for the adult blue marlin (*Makaira nigricans*), the adult and juvenile white marlin (*Kajikia albidus*), and sailfish (*Istiophorus platypterus*) and all life stages of the Caribbean reef shark (*Carcharhinus perezi*) (NMFS 2025).

3.1.6 MARINE PROTECTED MAMMALS

The proposed action may potentially affect marine protected mammals, including manatees, whales, and dolphins, which are protected under the Marine Mammal Protection Act (MMPA) (Public Law 92-522). The Bechara area is not located in a known manatee habitat, and the species is not commonly found in the area. Therefore, the likelihood of affecting an Antillean manatee is considered low. The San Juan Bay area and the ODMDS, located 2.2 nautical miles north of the San Juan Bay, are also areas where whales, such as humpback whales (*Megaptera novaeangliae*) and other marine mammals, including dolphins (Delphinidae), may be present.

The potential presence of these marine mammals in the project area requires consideration of measures to minimize or mitigate any potential impact to individual animals. As part of the existing project, to avoid collisions with manatees and other marine mammals, vessels traveling to and from the ODMDS would be required to operate at slow speeds, particularly in areas with known or suspected marine mammal presence. Additionally, as part of the existing project and the proposed project area activities, marine observers would be present during water work to monitor for marine mammals and implement measures to avoid disturbing or injuring them. These measures would be implemented in accordance with the MMPA and would be designed to minimize the potential for adverse effects on marine mammals.

3.1.7 COASTAL BARRIER RESOURCES

The Coastal Barrier Resources Act (CBRA) (Public Law 97-348) aims to protect coastal barriers, which are dynamic coastal ecosystems that provide important habitat for various species and help to protect coastal communities from storms and erosion. Under CBRA, certain areas are designated as Coastal Barrier Resources System (CBRS) units which are prohibited from certain federal expenditures. However, based on the project location, it is expected that there will be no effects on CBRS units as a result of the proposed project in the Bechara area. The closest CBRS unit is approximately 2.5 nautical miles west of the San Juan Harbor entrance, and the Bechara area is located within the San Juan Bay area, more than 3 nautical miles away from the Harbor entrance (See Figure 3-2). As a result, the project is not expected to impact any CBRS units, and no further consultation or analysis under CBRA is required. The project's location and design do not pose a risk to coastal barrier resources, and the focus can be on other environmental considerations, such as the potential impacts on mangrove wetlands and other species in the area.

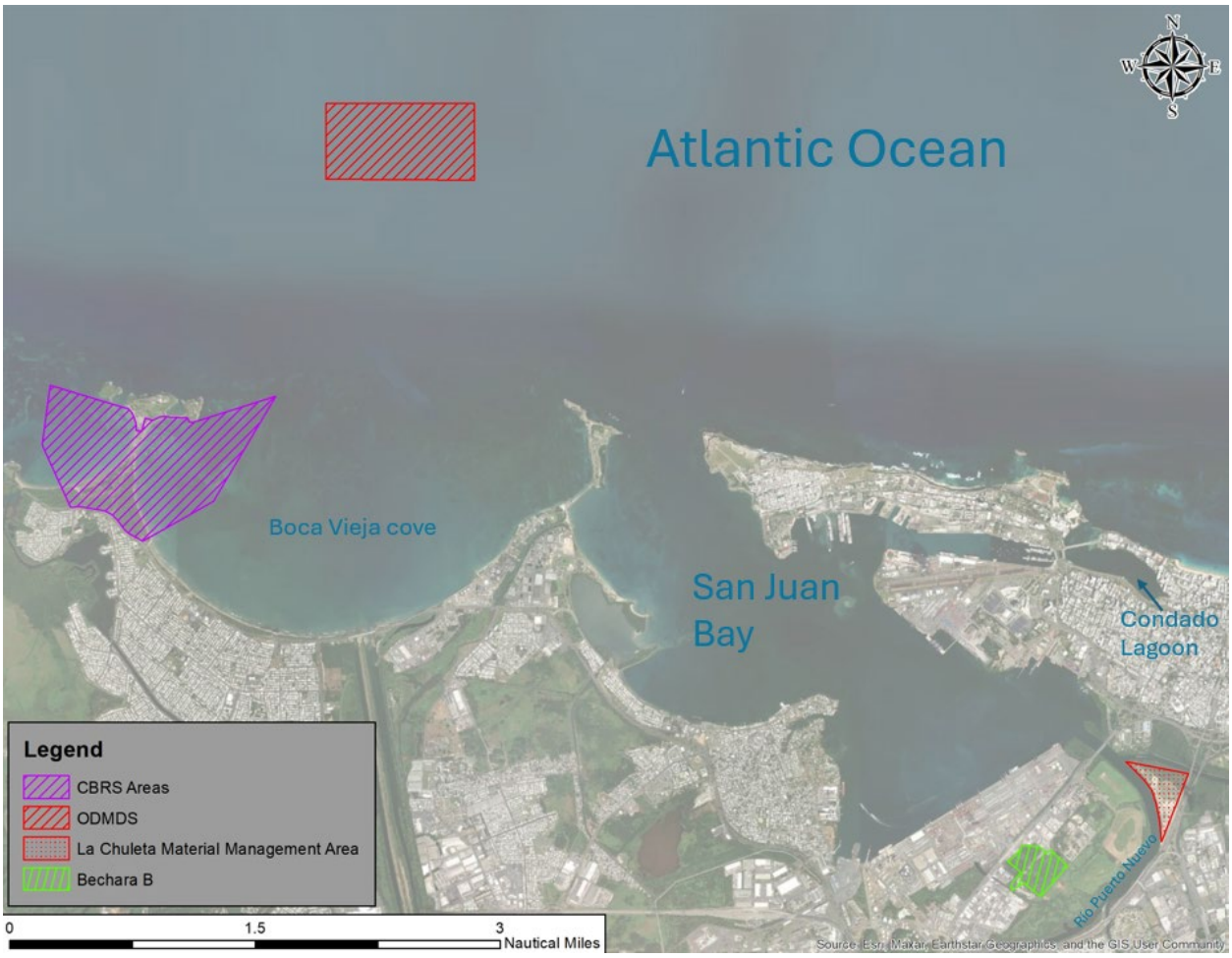

Figure 3-2. Approximate locations of the approved and existing material management sites (Red), ODMDS and La Chuleta MMA; closest CBRS unit (Purple), PR-86P; Preferred Alternative, Alternative 4- Bechara B MMA (Green); Designated Critical Habitat for the Antillean manatee: Boca Vieja cove and Condado Lagoon.

3.1.8 WATER QUALITY

The Río Puerto Nuevo and Río Piedras are freshwater rivers located within urban environments that flow into the San Juan Bay. The water flow of these rivers, along with their numerous tributaries, is heavily influenced by rainfall and storm events. The steep gradient in the uplands causes velocity flows to increase rapidly after such events, leading to erosion, turbid water, and degradation of water quality. Additionally, the water quality is potentially affected by adjacent land uses.

According to the Puerto Rico 2024 305(b) and 303(d) Integrated Report, the water quality conditions within the project area are characterized by frequent exceedances of water quality standards. The report highlights the potential sources of pollution in the Río Puerto Nuevo and Río Piedras watersheds, including urban runoff/storm sewers, confined animal feeding operations, landfills, and onsite wastewater systems. The report also identifies the water quality parameters that have been exceeded, including nutrients, heavy metals,

and pathogens, indicating a need for continued efforts to improve water quality and reduce pollutant loads in the Río Puerto Nuevo and Río Piedras watersheds.

In accordance with the PR Water Quality Standards, this information will be considered in the evaluation of potential environmental impacts associated with the proposed project. The project's potential effects on water quality will be assessed, and measures to mitigate any adverse impacts will be identified.

3.1.9 AIR QUALITY

The Clean Air Act (CAA) (42 USC § 7401 et seq.) requires federal actions to conform to an approved state implementation plan (SIP) designed to achieve or maintain an attainment designation for air pollutants, as defined by the National Ambient Air Quality Standard (NAAQS) (40 CFR Parts 50-58). The NAAQS establishes standards for criteria pollutants, including carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM2.5 and PM10), volatile organic compounds (VOC), and lead (Pb), to protect public health and welfare.

The project area, located within the PR Air Quality Control Region (AQCR), is subject to these regulations. According to the United States Environmental Protection Agency (EPA), the Municipality of San Juan, where the project area is situated, has been designated as a nonattainment area for SO_2 from 2018 through 2024 (EPA 2022). SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). The primary source of SO_2 emissions in the area is the burning of fossil fuels by power plants and industrial facilities, which release significant amounts of SO_2 into the atmosphere. Additional sources of emissions include large vehicles and equipment that burn high-sulfur fuel, as well as other industrial processes.

Emissions of particulate matter (PM), nitrogen oxides (NOx), and VOCs are also present in the project area, primarily due to industrial activities, vehicle traffic, and other human-related sources. These emissions can contribute to the formation of ground-level ozone and fine particulate matter, which can have adverse effects on human health and the environment (EPA, 2020).

The General Conformity Rule (40 CFR Parts 51 and 93) implements the CAA requirements for actions occurring in air quality nonattainment areas. Section 176(c) of the CAA requires that Federal agencies assure that their activities are in conformance with Federally approved CAA state implementation plans for geographical areas designated as “non-attainment” and “maintenance” areas under the CAA (40 CFR Part 93).

Greenhouse gas (GHG) emissions have been regulated under the Section 202(a) of the CAA since the EPA’s Endangerment Finding in 2009. This finding concluded that the buildup of GHGs in the atmosphere pose a threat to public health and welfare. In 2022, the United States’ total gross greenhouse gas emissions were 6,343.2 million metric tons of carbon dioxide equivalent (MMT CO_2e). Total gross U.S. emissions decreased by 3.0 percent from 1990 to 2022, down from a high of 15.2 percent above 1990 levels in 2007.

Gross emissions increased from 2021 to 2022 by 0.2 percent (14.4 MMT CO_2e). Net emissions (including sinks) were 5,489.0 MMT CO_2e. in 2022. Overall, net emissions increased by 1.3 percent from 2021 to 2022 and decreased by 16.7 percent from 2005 levels. Between 2021 and 2022, the increase in total greenhouse gas emissions was driven largely by an increase in CO_2 emissions from fossil fuel combustion across most end-use sectors due in part to increased energy use from the continued rebound of economic activity after the height of the COVID-19 pandemic. In 2022, CO_2 emissions from fossil fuel combustion increased by 1.0 percent relative to the previous year and were 1.1 percent below emissions in 1990. Carbon dioxide emissions from natural gas use increased by 5.2 percent (84.8 MMT CO_2e) from 2021, while CO_2 emissions from coal consumption decreased by 6.1 percent (58.6 MMT CO_2e) from 2021 to 2022. The increase in natural gas consumption and associated emissions in 2022 is observed across all sectors except U.S. Territories, while the coal decrease is due to reduced use in the electric power sector. Emissions from petroleum use also increased by 0.9 percent (19.0 MMT CO_2e) from 2021 to 2022. Carbon sequestration from the Land Use, Land-Use Change, and Forestry (LULUCF) sector offset 14.5 percent of total emissions in 2022 (EPA, 2024).

Puerto Rico ranks 19th among the Latin American and Caribbean counties with the highest CO_2 emissions. Industry, energy supply, and transportation sectors dominate the contribution of the Puerto Rico net GHG emissions. There is some uncertainty about the current level of greenhouse gas emissions in Puerto Rico. Estimates range from approximately 25 million $MtCO_2e$ emitted in 2018 to 46 million $MtCO_2e$ emitted in 2013. Despite the large range, these estimates represent less than 1 percent of the total CO_2 emitted in 2019 in the U.S. Based on population estimates for Puerto Rico in 2018 and 2019, total emission estimates would represent an approximate range of per capita emissions rates of between 7.4 and 12.8 $MtCO_2e$ per year. U.S. per capita emissions in 2018 were approximately 20.2 Mt CO_2e resulting in an estimated rate that is between 1.6 and 2.7 times higher than Puerto Rico. Historically, the energy, transportation, and industry sectors have been the primary CO_2 emitters in Puerto Rico. From 1990 to 2005, Puerto Rico's gross CO_2 emissions increased by 80 percent. However, since that time emissions have declined by about 42 percent. Per capita emissions have declined as well, although at a lower rate since some of the decline in absolute emissions is associated with population loss (PRCCC 2022).

3.1.10 NOISE

The existing ambient noise conditions in the Bechara project area are characterized as moderate to high, primarily due to the highly urbanized setting of the region. The project area is surrounded by a dense network of roads and highways, which generates significant levels of noise from heavy traffic, including passenger vehicles, trucks, and construction equipment. Additionally, the urban environment is home to a wide range of anthropogenic noise sources, such as industrial activities, commercial operations, and residential areas, which contribute to the overall noise levels in the area.

The natural environment also plays a role in shaping the ambient noise conditions in the project area. The surrounding physical and biological environment, including the Río

Puerto Nuevo and Río Piedras, can generate noise from natural sources such as water flow, wind, and wildlife. However, the dominant noise sources in the project area are anthropogenic in nature, and the urban setting is the primary driver of the moderate to high ambient noise levels.

The ambient noise levels in the project area can be expected to vary throughout the day, with peak noise levels typically occurring during rush hour periods and other times of high traffic activity. The noise levels may also be influenced by other factors, such as construction activities, special events, and emergency response situations. Overall, the existing ambient noise conditions in the Bechara project area are characterized by a complex mix of anthropogenic and natural noise sources, resulting in moderate to high noise levels that are typical of urban environments.

The potential impacts of the project on noise levels in the area will be assessed in accordance with the applicable federal regulations. The assessment will consider the potential for increased noise levels during construction activities, as well as the potential for long-term impacts on noise levels in the area. Measures to minimize or mitigate adverse noise impacts will be identified and implemented as necessary.

3.1.11 HAZARDOUS, TOXIC OR RADIOACTIVE WASTE

The Bechara project area has been evaluated for potential Hazardous, Toxic, or Radioactive Waste (HTRW) concerns. The Bechara site is located in an industrial zone and has a history of various uses, including placement of fill and staged material, dumping and a former firing range area. A car junkyard is also located in a parcel adjacent to the southwest corner of the property, with a closed landfill and a water treatment plant in closed proximity (See Figure 2-1). Geotechnical investigations and environmental assessments revealed on-site and off-site Recognized Environmental Conditions (RECs) that may indicate potential environmental concerns (See Appendix D). To address those concerns a Phase II Baseline Environmental Assessment was conducted in 2024.

The Final Phase II Baseline Environmental Assessment (BEA) report (See Appendix D), completed in November 2024, documented the presence of silty sand fill material, stiff clay, and clayey sand at the surface down to a depth of approximately 20 ft below land surface. The results of the soil boring samples indicate concentrations exceeding EPA industrial soil Risk-Based Screening Levels (RSL) for only lead in one location at a depth of 6-7 ft, polychlorinated biphenyls in one location at a depth of 7-8 ft, and arsenic in several locations at varying depths.

The NFS will provide lands free of hazardous substances for placement of material.

3.1.12 CLIMATOLOGY

Climatology is the scientific study of Earth’s climate. Natural processes and human actions have been identified as affecting the climate. However, increasing greenhouse gas (GHG) concentrations in the atmosphere resulting from human activity since the 19th century, such as fossil fuel combustion, deforestation, and other activities, are believed

to be a major factor in impacts to climate conditions. Increases in the concentrations of GHGs, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), in the atmosphere during the last 100 years have trapped additional solar radiation, intensifying the natural greenhouse effect and resulting in an increase in global average temperature at an average rate of 0.17 F per decade since 1901 (USEPA, 2021).

CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are the principal GHGs emitted which contribute to the rise in global air temperatures since the 1800s. Emissions of CO_2 and N_2O are largely byproducts of fossil fuel combustion, while CH_4 results from off-gassing, natural gas leaks from pipelines and industrial processes, and incomplete combustion associated with agricultural practices, landfills, energy providers, and other industrial facilities. Fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which have much higher potential for heat absorption than CO_2 are byproducts of certain industrial processes. Conversely, CO_2 sinks include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, and are two of the largest reservoirs of CO_2 sequestration.

3.2 HUMAN ENVIRONMENT

3.2.1 CULTURAL RESOURCES

The Bechara MMA project area is located within the greater San Juan region, an area rich in history and heritage. The region is home to a diverse range of cultural resources, including archaeological sites, historic structures, and historic districts that represent the precolonial inhabitants, Spanish settlement and development, and twentieth-century development in PR. The Bechara site historically consisted of open water and wetlands based on 1930's aerial photography and soil logs. By 1967 the area underwent significant disturbance and alteration (See Figure 3-2). No historic structures are present at the Bechara site, and the historic presence of wetlands and subsequent cut and fill activities preclude the existence of historic properties within the study area.

Figure 3-3. Historical satellite imagery of the Bechara area.

3.2.2 AESTHETICS

The aesthetics of the Bechara project area refer to the visual resources present in the area. The project area is characterized by densely vegetated sites with little topographic relief, providing "green space" within the greater San Juan metropolitan area. However, the site is not considered a Critical Wildlife Area by the DNER or the USFWS, and it is currently filled with debris. The Bechara site is surrounded by a mix of industrial and urban features. The northern portion of the site is bounded by roadways, including the J.F. Kennedy Expressway and Kennedy service road, as well as an industrial park with storage buildings, a car dealership parking lot, and a water treatment plant. The southern portion of the site is bordered by electric power transmission lines and is adjacent to disturbed, non-forested, undeveloped land, including a closed landfill. The southwestern portion of the site abuts a small portion of the Río Puerto Nuevo (also known as Bechara Channel). A gravel road bisects the site from northeast to southwest, ending in an automobile junkyard and used car parts dealer, which would be outside the proposed project area. A residential structure is located near the project site boundary, and the north and east portions of the site are bounded by large parking lots.

3.2.3 RECREATIONAL RESOURCES

The Bechara project area currently lacks recreational resources that are accessible and usable by the public. The material management site is not explicitly off-limits to the public, but it is not designed or maintained for recreational use. The dense vegetation present at the site limits accessibility and usability, making it unsuitable for recreational activities. In summary, the existing recreational resources in the Bechara project area are limited, and the site is not currently used for recreational purposes. The proposed project will consider the potential impacts on recreational resources.

3.2.4 FLOOD HAZARDS

The Bechara project area, located within the San Juan Metropolitan Area, is prone to severe flooding. Filled material previously placed at the Bechara area currently cuts off the natural overland flow of water, causing local flooding at the Zona Portuaria exit of the Kennedy Expressway. This existing condition exacerbates the flood hazard in the area, which poses a significant threat to the population and economic activity. The Río Puerto Nuevo basin and its tributaries, to which the Bechara area is part of, are susceptible to flash flooding due to inadequate channel capacity, flow limitations at bridges, increased stormwater runoff from impervious surfaces, and flood storage losses resulting from intense urbanization encroachments into the floodplain. According to the Federal Emergency Management Agency (FEMA), the Bechara site is designated as a Special Flood Hazard Area (SFHA) zone AE (FEMA 2024), indicating that the area is expected to be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year, also known as the base flood or 100-year flood.

As mentioned above, the current conditions at the Bechara project area cuts off the natural overland flow of water, causing local flooding. This exacerbates the flood hazard in the area, and it will be essential to address this issue in the design of the material

management area. The proposed project will include measures to allow drainage to occur around the site, mitigating flooding impacts and reducing the risk of local flooding.

Climate-related effects are expected to exacerbate flood hazards in the Bechara area, with projected changes in precipitation, temperature, and sea level. Warmer temperatures are anticipated to lead to more intense precipitation events, while sea level rise is expected to increase the frequency and severity of coastal flooding. Specifically, for the San Juan Bay area, where the Bechara project is located, sea level is projected to rise by up to 10 inches by 2030 and up to 39 inches by 2100, according to the National Oceanic and Atmospheric Administration (NOAA) (NOAA 2022). Additionally, the region is expected to experience more frequent and intense rainfall events, with a potential increase of up to 20% in precipitation intensity by 2050, as reported by the Intergovernmental Panel on Climate Change (IPCC) (PRCCC 2013). These changes will likely increase the flood risk in the Bechara area, making it essential to consider these factors in the evaluation of potential environmental impacts associated with the proposed project.

The flood hazard conditions in the project area, including the potential impacts of climate-related effects, will be carefully evaluated to ensure that the proposed project does not increase flood risk or damage to surrounding properties and infrastructure. The project's design and implementation will take into account the need for flood resilience and adaptation, incorporating measures to mitigate the effects of flooding and protect the community and environment from the anticipated changes in precipitation, temperature, and sea level.

3.2.5 SOCIOECONOMICS

The San Juan Metropolitan area, which encompasses the Bechara project area, has a diverse socioeconomic profile. According to the 2020 United States Census Bureau, the San Juan Metro area has a total population of 342,259 persons, with a predominantly Hispanic or Latino population, accounting for 97.9% of the total population. The majority of the population, 84.8%, is 18 years or older. The median household income in the San Juan Metro area is $26,111, with 39.5% of persons living below the poverty line and an unemployment rate of 9.8% (U.S. Census Bureau, 2020).

In the specific area surrounding the Bechara project site, the population is estimated to be part of the larger San Juan Metro area. The local economy in the project area is supported by various businesses and attractions, including the Plaza Las Américas, a major shopping mall with several retail stores and restaurants, which serves as an important source of revenue for the local economy. The nearby Hiram Bithorn Stadium hosts various events, including baseball games, concerts, carnivals, and expos, further contributing to the local economy.

The project area is also served by a local hospital, located just west of the area, which provides essential healthcare services to the community. The presence of these

businesses and attractions highlights the importance of considering the socioeconomic impacts of the proposed project on the local community and economy.

4 ENVIRONMENTAL EFFECT

This section provides the scientific and analytic basis for comparing the alternatives carried forward, as required by the NEPA (33 CFR § 230). The analysis is organized by resource topic, as described in Section 3 (Affected Environment), and presents the potential effects of each alternative on the existing conditions. This evaluation includes determining anticipated direct, indirect, and cumulative effects of the alternatives on the human environment.

The NEPA implementing regulations (33 CFR § 230) define effects or impacts as changes to the human environment that are reasonably foreseeable and have a reasonably close causal relationship to the alternatives. The potential effects of the alternatives are described using the following terms:

- **Beneficial**: A positive change in the condition or appearance of the resource, or a change that moves the resource toward a desired condition.
- **Adverse**: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

The intensity, or severity, of the potential impact is rated as follows:

- **Negligible Effect**: Change to the resource or discipline is barely perceptible, not measurable, and confined to a small area.
- **Minor Effect**: Change to the resource or discipline is perceptible, measurable, and localized.
- **Moderate Effect**: Change is clearly detectable and could have an appreciable effect on the resource or discipline; or the effect is perceptible and measurable throughout the study area.
- **Major Effect**: Change to the resource or discipline is substantial, highly noticeable, and would occur on a regional scale.

The duration of the potential impact is rated as follows:

- **No Duration**: No effect.
- **Temporary**: Effects generally occur during construction and are expected to end by the completion of construction, with resources recovering to their pre-construction conditions.
- **Short-term**: Effects generally occur during construction and for a limited time thereafter, generally less than two years, by the end of which the resources recover to their pre-construction conditions.
- **Long-term**: Effects last beyond the construction period, and the resources may not regain their pre-construction conditions for a longer period.

The resource categories analyzed in this section are presented in the subsequent subsections. The potential effects of each alternative on these resources are described below.

4.1 NATURAL ENVIRONMENT

4.1.1 WETLANDS

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, there would be No Effect to wetlands, as there are no wetlands within the scope of the alternative. The intensity of the potential impact is rated as negligible, and the duration is rated as no duration, as there would be no change to the wetland resources.

The No Action Alternative would not result in any adverse effects to wetlands, and therefore, would not require any mitigation measures. The alternative would maintain the existing conditions, and no wetland resources would be impacted.

Alternative 3: Bechara A Material Management Area

Under this alternative, significant long-term adverse impacts to wetlands are anticipated. The Bechara site, which was determined to have jurisdictional wetlands during a 2023 wetland delineation (Water & Air Inc. 2023), would experience substantial changes. The site of this Alternative contains an approximate 15.6 acres of jurisdictional wetlands, which would be affected by the proposed material management activities.

The intensity of the potential impact is rated as major, as the changes to the wetland would be substantial and highly noticeable. The duration of the potential impact is rated as long-term, as the effects would last beyond the construction period, and the resources may not regain their pre-construction conditions for a longer period.

The proposed activities would involve the complete clearance of vegetation, and the placement of clean fill from various contracts for storage or reuse. Although vegetation would be seeded and/or replanted at the site after material placement has been complete, the initial disturbance and alteration of the wetland ecosystem would still occur.

The significant impacts to this wetland would be mitigated and therefore rendered insignificant as a result of implementing a proposed mitigation and contingency plan. The Corps will coordinate with resource agencies on the design and implementation of the mitigation measures to avoid, minimize, or compensate for the adverse environmental impacts.

Alternative 4: Bechara B Material Management Area

This alternative would result in significant impacts to wetlands, similar to those described in Alternative 3, but with a smaller area of jurisdictional wetland being affected, totaling an approximate 11.4 acres (Water & Air Inc. 2023). The intensity and duration of the potential impacts would also be similar, with major and long-term adverse effects anticipated. As with Alternative 3, a mitigation and contingency plan would rendered insignificant the wetland impacts and would be required to compensate for the adverse environmental impacts. The Corps would coordinate with resource agencies on the

design and implementation of the mitigation and contingency measures, with the goal of minimizing damage to wetland resources and achieving no net loss of wetlands. The mitigation and contingency plan would be developed in accordance with the national goal of no net loss of wetland resources (USACE and EPA 2008), and would include measures to protect, reserve, conserve, and restore wetland resources.

4.1.2 VEGETATION

The analysis of the alternatives' effects on vegetation is based on the existing conditions described in Section 3.1.2, which highlights the diverse range of plant species at the Bechara site, including 85 plant species with 49% being native to PR. However, the presence of invasive exotic species poses a threat to the native vegetation and ecosystem processes.

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, there would be no effect on vegetation, as this alternative does not involve any changes to the existing conditions that would impact vegetation.

Alternative 3: Bechara A Material Management Area

This alternative would result in a moderate adverse effect on vegetation at the proposed material management site, due to the clearing of dense vegetation and the loss of species and habitat. The duration of this adverse effect is rated as long-term, as the Bechara A MMA will operate for years after completing the construction of the MMA. However, vegetation will be seeded and/or planted, and it will also naturally reestablish, reducing the intensity of the adverse effect.

Alternative 4: Bechara B Material Management Area

The effects of Alternative 4 on vegetation would be similar to those of Alternative 3, with a moderate adverse effect anticipated due to the clearing of vegetation at the material management site. As with Alternative 3, the vegetation will be seeded and/or planted, and it will naturally reestablish reducing the intensity of the adverse effect. The duration of this adverse effect is rated as long-term, however, once the area is vegetated it will provide beneficial effects.

4.1.3 THREATENED AND ENDANGERED SPECIES

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, there may be temporary minor impacts to T&E species. Use of the existing material management site may have temporary minor impacts to T&E species. La Chuleta MMA has been constructed already, therefore, vegetation and trees have been removed. During maintenance and operations there may be the potential presence of the Puerto Rican boa due to the proximity to potential habitat areas. However, the Corps will include applicable Terms and Conditions in the project plans and specifications, including Puerto Rican boa Conservation Measures, to avoid any direct

harm to the species. All other species have a "no effect" determination based on their lack of presence in the area.

Use of the ODMDS may have temporary minor impacts to T&E species due to the potential interaction of vessels with species along the way. Overall, this RPN Project MANLAA, the following species:

- Sea turtles
- Whales
- Corals
- Antillean manatees
- Nassau grouper
- Giant manta ray
- Scalloped hammerhead
- Puerto Rican boa

Alternative 3: Bechara A Material Management Area

TABLE 3. EFFECT DETERMINATIONS FOR SPECIES THAT WERE IDENTIFIED BY USFWS IPAC WITH THE POTENTIAL TO BE IN THE PROJECT AREA.

Common Name	Scientific Name	Corps' effect determination
Roseate tern	*Sterna dougallii dougallii*	NE
Antillean manatee	*Trichechus manatus manatus*	MANLAA
Queen conch	*Aliger gigas*	NE
Palo de rosa	*Ottoschulzia rhodoxylon*	NE
Puerto Rican boa	*Chilabothrus inornatus*	MANLAA

The proposed action at the Bechara site has been evaluated for potential impacts on threatened and endangered species.

Roseate tern

The roseate tern (*Sterna dougallii dougallii*) is a threatened bird species listed under the ESA. Based on the species' specific breeding and nesting habits, the likelihood of encountering the roseate tern in the Bechara area is low. The project area does not match the species' preferred breeding and nesting habitats, and sightings of the roseate tern in the area are rare. Therefore, the Corps has determined that the project would have no effect on the roseate tern.

Palo de rosa

The palo de rosa (*Ottoschulzia rhodoxylon*) is a small evergreen tree that is native to PR and listed as endangered under the ESA. The species is typically found in forests with high precipitation, well-drained soil, and moderate to high levels of sunlight. Given the specific habitat requirements of the palo de rosa, it is unlikely to be present in the Bechara area, which has different habitat characteristics. Therefore, the Corps has determined that the project would have no effect on the palo de rosa.

Queen conch

The queen conch (*Aliger gigas*) is a threatened species under the ESA, typically found in warm, shallow waters in the Caribbean Sea, inhabiting seagrass beds, coral reefs, and rocky crevices. However, the Bechara area is primarily a mangrove habitat. Furthermore, this mangrove habitat is dominated by black and white mangroves, which are further upland and at a higher elevation than the red mangroves making it an even less desirable habitat for queen conch. Given the habitat preferences of the queen conch and the mangrove habitat in the Bechara area, it is unlikely to be present. Therefore, it is determined that the proposed project in the Bechara area would have no effect on the queen conch or its habitat.

Antillean manatee

The Antillean manatee (*Trichechus manatus manatus*) is a subspecies of the West Indian manatee, listed as endangered under the ESA. The species is found in the warm, shallow waters of the Caribbean Sea, including PR. While the project area is not located in a known manatee habitat, there is potential for them to be present in manatee accessible water areas during in-water work construction in the Bechara channel. To minimize potential impacts, the project would include conservation measures such as informing project personnel about the potential presence of manatees, implement protocols for surveying the work area. Additionally, the contractor could also maintain a log of manatee sightings and incidents. Therefore, the likelihood of affecting the Antillean manatee is considered low, and the project may affect, but is not likely to adversely affect the Antillean manatee.

Puerto Rican boa

The Puerto Rican boa (*Chilabothrus inornatus*) is an endangered reptile species that inhabits a diverse range of terrestrial and arboreal habitats in PR. The species is primarily found in the northwestern karst region of PR but can also be found in rainforests and plantations. While it is possible that the species may be present in the project area, it is likely to be an uncommon occurrence. The Corps has determined that the project may affect, but is not likely to adversely affect the Puerto Rican boa. To minimize potential impacts, the project would include conservation measures such as informing project personnel about the potential presence of boas, marking project boundaries to avoid habitat degradation, and conducting surveys to detect boas before construction activities.

In accordance with the NEPA and the ESA, the Corps has considered the potential effects of the proposed action on threatened and endangered species. The project has been

designed to minimize potential impacts on listed species, and conservation measures have been included to ensure compliance with relevant laws and regulations.

Alternative 4: Bechara B Material Management Area

Under this Alternative 4, the evaluated potential effects of the proposed action on threatened and endangered species in the Bechara area are the same as Alternative 3. The species of concern are the roseate tern (*Sterna dougallii dougallii*), palo de rosa (*Ottoschulzia rhodoxylon*), queen conch (*Aliger gigas*), Antillean manatee (*Trichechus manatus manatus*), and Puerto Rican boa (*Chilabothrus inornatus*).

The Corps has determined that the project would have no effect on the roseate tern, palo de rosa and queen conch, as the project area does not match the species' preferred habitats. For the Antillean manatee and Puerto Rican boa, the project may affect, but is not likely to adversely affect determination, as the likelihood of affecting these species is considered low.

To minimize potential impacts on these species, the project would include conservation measures such as informing project personnel about the potential presence of these species, marking project boundaries to avoid habitat degradation, and conducting surveys to detect these species before construction activities.

4.1.4 FISH AND OTHER WILDLIFE COMMUNITIES (OTHER THAN T&E SPECIES)

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, the existing conditions at the ODMDS and La Chuleta MMA would continue, with no changes to the current management practices. The effects on fish and other wildlife communities would be negligible, as the current conditions would persist. The grass shrimp, if present in the area, would continue to inhabit the area, and the existing vegetation would provide habitat for various bird species, including the Puerto Rican oriole, a species of conservation concern. The temporary adverse effects associated with the removal of vegetation and construction activities under the material management options would not occur under this alternative. Therefore, the No Action Alternative would result in no effect on fish and other wildlife communities.

Alternative 3: Bechara A Material Management Area

The Bechara A MMA would result in temporary minor adverse effects on fish and other wildlife communities during construction. The removal of vegetation and alteration of the channel would displace species temporarily. However, with the restoration and enhancement of wetlands, those species would return to the area. The effect on bird species would be minor and temporary, as the material placed in the area would be planted and vegetated, and wetlands would be restored and enhanced. This would provide a suitable habitat for bird species, including the Puerto Rican oriole.

Restoration efforts would be associated with this alternative and aimed to reverse adverse impacts of human activity and restore ecological resources, including fish and wildlife

habitats. This would improve degraded ecosystem function and structure, and the restoration of wetlands and aquatic systems would be part of this effort. By restoring wetland hydrology, and native aquatic vegetation, the alternative would contribute to the life cycle of fish and wildlife populations and the improvement of water quality.

Alternative 4: Bechara B Material Management Area

The effects on fish and other wildlife communities under Alternative 4 would be similar to those described for Alternative 3. The construction activities would result in temporary minor adverse effects, but the restoration and enhancement of wetlands would lead to the return of displaced species. The effect on bird species would be minor and temporary, as the area would be planted and vegetated, and wetlands would be restored and enhanced, providing a suitable habitat for bird species.

Restoration efforts would be associated with this alternative, similar to Alternative 3, and would be aimed to reverse adverse impacts of human activity and restore ecological resources, including fish and wildlife habitats.

4.1.5 ESSENTIAL FISH HABITAT

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The No Action Alternative would not involve any changes to the existing conditions within the Bechara area in San Juan. As a result, there would be no potential effects to EFH from this alternative. The existing mangroves and tidally influenced areas would continue to provide habitat for a diverse range of marine species. No consultation with NMFS would be required for this alternative, as there would be no federal action that may affect EFH.

Alternative 3: Bechara A Material Management Area

The proposed action may affect, but is not likely to adversely affect EFH. The EFH area is a degraded landward wetland in the Bechara site dominated by black and white mangroves. This is not the type of habitat conducive to the presence of adults or juveniles of blue marlin, white marlin, sailfish and Caribbean reef shark. In the existing wetlands conditions Caribbean reef shark pups are not expected to use the area for shelter and/or food supply.

Although no adverse impacts to EFH are expected, the Corps will still implement measures to minimize any potential effects on the environment. These measures include the restoration and enhancement of wetlands in the Bechara area, which will help to maintain or improve the overall quality and quantity of EFHs in the area.

Alternative 4: Bechara B Material Management Area

This alternative, similar to Alternative 3, may affect, but is not likely to adversely affect EFH and although no adverse impacts to EFH are expected, the Corps will still implement measures to minimize any potential effects on the environment.

4.1.6 MARINE PROTECTED MAMMALS

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action alternative, the proposed new material management area would not be constructed, and the existing conditions in the Bechara area would remain unchanged. The Corps has previously consulted with the USFWS and NMFS regarding the use of the ODMDS and La Chuleta MMA. The SMMP for PR Dredged Material Disposal Sites, updated in 2023, includes consultation for the transport of dredged materials to the ODMDS (EPA and USACE SMMP 2023). The use of the ODMDS may affect, but not likely to adversely afect marine protected mammals, corals and measures to minimize or mitigate any potential impact to individual animals would be implemented.

Alternative 3: Bechara A Material Management Area

Under Alternative 3, similar to the analysis in the T&E Species section for the Antillean manatee, the likelihood of affecting the Antillean manatee is considered low. However, the potential presence of these marine mammals in the project area of the Bechara channel requires consideration of measures to minimize or mitigate any potential impact to individual animals. Therefore, the conservation measures mentioned in the T&E Species section for the Antillean manatee would be implemented to minimize the risk of adverse effects on the individuals.

Alternative 4: Bechara B Material Management Area

Under Alternative 4, similar to Alternative 3, the likelihood of affecting the Antillean manatee is considered low. However, to minimize potential impacts, the project would implement conservation measures to protect individual animals during construction activities by the Bechara channel area.

4.1.7 COASTAL BARRIER RESOURCES

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The No Action Alternative would result in no potential effects to the existing Coastal Barrier Resources.

Alternative 3: Bechara A Material Management Area

Alternative 3 would result in no potential effects to the existing Coastal Barrier Resources.

Alternative 4: Bechara B Material Management Area

Alternative 4 would result in no potential effects to the existing Coastal Barrier Resources.

4.1.8 WATER QUALITY

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, the existing management areas would continue to be used, and the project would comply with the existing Water Quality Certificate (WQC) issued on 11 June 1993. The WQC has a turbidity requirement of 10 Nephelometric Turbidity Unit (NTUs). To ensure compliance with this requirement, turbidity and erosion control measures, turbidity monitoring, and best management practices would be implemented. These measures would help to minimize the potential impacts on water quality, including increases in turbidity and suspended solids. The No Action Alternative would not result in significant changes to the existing water quality conditions, and the project would continue to operate within the parameters established by the existing WQC.

Alternative 3: Bechara A Material Management Area

Under Alternative 3, a new WQC would be requested for the construction of the new material management area. The new WQC is expected to have a turbidity compliance requirement of 10 NTUs, as stipulated in the PR Water Quality Standards Regulation (DNER 2022). To ensure compliance with this requirement, turbidity and erosion control measures, turbidity monitoring, and BMPs would be implemented, similar to those used in Alternative 1. The construction of the new material management area may result in short-term increases in turbidity during the construction phase; however, water quality is expected to quickly return to pre-construction conditions following completion of construction.

Alternative 4: Bechara B Material Management Area

Under Alternative 4, the same measures would be implemented as in Alternative 3, including the request for a new WQC and the implementation of turbidity and erosion control measures, turbidity monitoring, and best management practices. The Bechara B Alternative is also expected to result in short-term increases in turbidity during the construction phase, but water quality is expected to quickly return to pre-construction conditions following completion of construction. The potential impacts of this Alternative on water quality would be similar to those expected under Alternative 3.

4.1.9 AIR QUALITY

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The No Action Alternative would result in minor, temporary adverse impacts on air quality due to emissions from transportation and operations of the existing management areas. Although, the Municipality of San Juan is designated as a non-attainment area for SO_2, according to EPA NAAQS (EPA 2024d). The main and most significant source of SO_2 emissions in the San Juan area are the power plants and industrial facilities. Heavy equipment has the potential to be a source of SO_2, however, the use of Ultra Low Sulfur Diesel (ULSD) fuel in heavy equipment, as required by Federal diesel standards since

2014, would minimize SO_2 emissions. Additional measures such as idling restrictions, diesel equipment reduction, and the use of best available technology could further reduce emissions. After construction is completed, air quality is expected to revert to background levels, with no significant long-term impacts on air quality. The construction of the project would minimally alter existing conditions, and no significant quantities of criteria pollutants, including PM, nitrogen oxides (NOx), and VOCs, would be emitted.

No construction emissions will be generated under Alternative 1. The continued use of the ODMDS and La Chuleta MMAs will generate GHG emissions that have not been quantified for this analysis. There will be no impacts to the 15.6 acres of wetlands under the No Action Alternative.

Wetlands play an important but complex role in the global carbon cycle, contributing to greenhouse gas regulation through carbon sequestration. Wetlands may serve as carbon sinks because they store large amounts of carbon in aboveground biomass (e.g., forested wetlands) and soils (e.g., peatlands and coastal marshes); however, wetlands can also emit significant quantities of CH_4, and N_2O to the atmosphere. The US Army Corps of Engineers Net Emissions Analysis Tool (NEAT) calculates different rates of GHG production and sequestration based on the type of aquatic ecosystem. Using the US Fish and Wildlife Service (USFWS) Wetland Mapping Tool, it was determined that existing wetlands within the Bechara area are categorized as Marine & Estuarine – Forested & Shrub. The period of analysis for this study is 50 years, from 2029 to 2079. Annual and lifetime values for CO_2 sequestration and CH_4 and N_2O production were calculated. Annual and project lifetime emissions, based on the 15.6 acres of existing wetlands, are summarized in Table 4 (See Appendix H for analysis).

Table 4. Estimated GHG Emissions Calculated for the Existing Wetlands in the Bechara MMA

GHG	Wetlands Loss (Ac)	Annual Emissions Production (MT/yr)	Lifetime Emissions Production (MT)	Lifetime Emissions (MT CO_2e)
CO_2	15.6	-14.54	-727.06	-727.06
CH_4	15.6	0.05	2.71	67.80
N_2O	15.6	0.02	0.91	270.33

Total lifetime wetland emissions for No Action Alternative are estimated to be -388.93 MT CO_2e, which reflects the CO_2 sequestration and production of CH_4 and N_2O from the 15.6 acres of existing wetlands.

Alternative 3: Bechara A Material Management Area

The Bechara A alternative would have temporary adverse impacts to air quality due to construction emissions. The use of ULSD fuel and implementation of emission-reducing measures would minimize SO_2 emissions. The project would not significantly alter existing air quality conditions, and emissions of criteria pollutants, including PM, NOx, and VOCs, would be negligible. The Bechara alternative would conform to the approved SIP and the NAAQS requirements.

Temporary adverse impacts from GHG emissions will occur during the construction of Alternative 3, which includes the placement of dredge material from the Río Puerto Nuevo into the Bechara A MMA, which includes approximately 15.6 acres of jurisdictional estuarine forested wetlands that will be impacted.

Construction is anticipated to last approximately two years and would result in a temporary increase in GHG emissions during that time, consisting primarily of CO_2 generated by internal combustion engines burning diesel fuel. Fuel estimates were based on a construction cost estimate prepared by USACE in 2023. The cost estimate was based on filling the Bechara B MMA, which is approximately 6.5% smaller than the Bechara A MMA. Fuel volumes to construct Alternative 3 were assumed to be 6.5% greater than the Bechara B MMA cost estimate, for purposes of this analysis. A quantitative analysis of construction-related GHG emissions was conducted and the results are summarized in Table 5 (See Appendix H for analysis).

Table 5. Estimated GHG Emissions for Construction of Alternative 3

GHG	Amount of Fuel (gal)	Emissions Factor (g/gal)	Total Produced (MT)	CO_2e (MT)
CO_2	370,098	10,210.00	3,778.70	3,778.70
CH_4	370,098	1.01	0.37	9.34
N_2O	370,098	0.94	0.35	103.67

Total short-term construction emissions for Alternative 3 are estimated to be 3,891.72 MT CO2e. Following completion of construction, no O&M emissions are anticipated.

Annual and lifetime values for the loss of CO_2 sequestration and CH_4 and N_2O production were calculated. Annual and project lifetime emissions, based on the loss of 15.6 acres of wetlands, are summarized in Table 6 (See Appendix H for analysis).

Table 6. Estimated GHG Emissions Calculated for the Loss of Wetlands Under Alternative 3

GHG	Wetland Loss (Ac)	Annual Emissions Production (MT/yr)	Lifetime Emissions Production (MT)	Lifetime Emissions (MT CO_2e)
CO_2	15.6	24.09	1,204.33	1,204.33
CH_4	15.6	-1.33	-66.65	-1,666.15
N_2O	15.6	-0.02	-1.15	-341.34

Total lifetime wetland emissions for Alternative 3 are estimated to be -803.16 MT CO_2e, which reflects the loss of CO_2 sequestration and production of CH_4 and N_2O from the 15.6 acres of existing wetlands.

Net emissions were calculated using the NEAT model and are defined for this project as the short-term GHG emissions generated during construction plus the long-term (50-year) impact of filling in wetlands and the subsequent loss of carbon sequestration capability. Lastly, the lifetime GHG emissions for the No Action Alternative were subtracted from the total to yield the net emissions. O&M emission for the No Action Alternative are unknown so the net emissions are likely over-estimated. Net emissions for Alternative 3 are summarized in Table 7 (See Appendix H for analysis).

Table 7. Net Emissions Summary for Alternative 3

GHG	Construction GHG Emissions (MT)	50-Year Wetland GHG Emissions (MT)	No Action Wetland Emissions (MT)	Net Project Emissions (MT)
CO_2	3,778.70	1,204.33	-727.06	5,710.09
CH_4	0.37	-66.65	2.71	-68.98
N_2O	0.35	-1.15	0.91	-1.70
CO_2e	3,891.72	-803.16	-388.93	3,477.49

Alternative 4: Bechara B Material Management Area

The Bechara B alternative would have temporary adverse impacts to air quality due to construction emissions. The project would not significantly alter existing air quality conditions, and emissions of criteria pollutants, including PM, NOx, and VOCs, would be

negligible. The Bechara B alternative would comply with the General Conformity Rule (40 CFR Parts 51 and 93) and the CAA requirements for actions occurring in air quality nonattainment areas. The project would be designed to minimize air quality impacts and ensure conformance with the NAAQS standards, protecting public health and welfare.

Temporary adverse impacts from GHG emissions will occur during the construction of Alternative 4, which includes the placement of dredge material from the Río Puerto Nuevo into the 65-acre Bechara B MMA, which includes approximately 11.4 acres of jurisdictional estuarine forested wetlands that will be impacted.

Construction is anticipated to last approximately two years and would result in a temporary increase in GHG emissions during that time, consisting primarily of CO_2 generated by internal combustion engines burning diesel fuel. Fuel estimates were based on a construction cost estimate prepared by USACE in 2023. A quantitative analysis of construction-related GHG emissions was conducted and the results are summarized in Table 8 (See Appendix H for analysis).

Table 8. Estimated GHG Emissions for Construction of Alternative 4

GHG	Amount of Fuel (gal)	Emissions Factor (g/gal)	Total Produced (MT)	CO_2e (MT)
CO_2	347,510	10,210.00	3,548.07	3,548.07
CH_4	347,510	1.01	0.35	8.77
N_2O	347,510	0.94	0.33	97.34

Total short-term construction emissions for Alternative 4 are estimated to be 3,654.19 MT CO2e. Following completion of construction, no O&M emissions are anticipated.

Alternative 4 includes impacts to approximately 11.4 acres of wetlands. Using the US Fish and Wildlife Service (USFWS) Wetland Mapping Tool, it was determined that existing wetlands within the Bechara area are categorized as Marine & Estuarine – Forested & Shrub. The period of analysis for this study is 50 years, from 2029 to 2079. Annual and lifetime values for the loss of CO_2 sequestration and CH_4 and N_2O production were calculated. Annual and project lifetime emissions, based on the loss of 11.4 acres of wetlands, are summarized in Table 9 (See Appendix H for analysis).

Table 9. Estimated GHG Emissions calculated for the Loss of Wetland and Aquatic Habitats.

GHG	Wetland Loss (Ac)	Annual Emissions Production (MT/yr)	Lifetime Emissions Production (MT)	Lifetime Emissions (MT CO_2e)
CO_2	11.4	17.66	883.18	883.18
CH_4	11.4	-0.98	-48.87	-1,221.84
N_2O	11.4	-0.02	-0.84	-250.32

Total lifetime wetland emissions for Alternative 4 are estimated to be -588.99 MT CO_2e, which reflects the loss of CO_2 sequestration and production of CH_4 and N_2O from the 11.4 acres of existing wetlands.

Net emissions were calculated using the NEAT model and are defined for this project as the short-term GHG emissions generated during construction plus the long-term (50-year) impact of filling in wetlands and the subsequent loss of carbon sequestration capability. Lastly, the lifetime GHG emissions for the No Action Alternative were subtracted from the total to yield the net emissions. O&M emission for the No Action Alternative are unknown so the net emissions are likely over-estimated. Net emissions for Alternative 4 are summarized in Table 10 (See Appendix H for analysis).

Table 10. Net Emissions Summary for Alternative 4

GHG	Construction GHG Emissions (MT)	50-Year Wetland GHG Emissions (MT)	No Action Wetland Emissions (MT)	Net Project Emissions (MT)
CO_2	3,548.07	883.18	-727.06	5,158.31
CH_4	0.35	-48.87	2.71	-51.23
N_2O	0.33	-0.84	0.91	-1.42
CO_2e	3,654.19	-588.99	-388.93	3,454.15

4.1.10 NOISE

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The No Action Alternative would result in temporary adverse impacts on noise due to heavy equipment noise created from transportation and operations of the existing management areas. However, the noise levels would continue to be characterized as moderate to high, primarily due to the highly urbanized setting and the presence of a dense network of roads and highways. The noise levels would vary throughout the day, with peak levels during rush hour periods and other times of high traffic activity. As there would be no construction activities, the noise levels would not be affected by temporary construction noise. The No Action Alternative would seek to comply with the Government of PR Noise Control Contamination Regulation.

Alternative 3: Bechara A Material Management Area

The Bechara A alternative would involve construction activities in Commercial and Industrial zones. However, the construction noise would be temporary and would comply with the Government of PR Noise Control Contamination Regulation. The noise levels during construction would be higher than the existing ambient noise levels, but would return to the existing conditions after construction is completed. The Bechara alternative would not significantly alter the existing noise environment, as the area is already characterized by high levels of noise from anthropogenic sources.

Alternative 4: Bechara B Material Management Area

The Bechara B alternative would have similar noise impacts as the Bechara A alternative (Alternative 3), with temporary construction noise in Commercial and Industrial zones. As described in Alternative 3, the construction noise would comply with the Government of PR Noise Control Contamination Regulation, and measures would be taken to minimize or mitigate adverse noise impacts. The Bechara B alternative would not introduce new noise-generating activities that would significantly alter the existing noise environment.

4.1.11 HAZARDOUS, TOXIC, OR RADIOACTIVE WASTE

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, the existing material management areas would continue to be used, and no new HTRW investigations would be required. Based on previous results and analysis from HTRW assessments, studies, and investigations, the Corps has determined that no adverse impacts to the environment would be expected. The No Action Alternative would not result in any changes to the existing HTRW conditions within the Bechara project area. The existing conditions would be monitored and managed in accordance with applicable regulations and guidelines.

Alternative 3: Bechara A Material Management Area

The Bechara A MMA has been evaluated for potential HTRW concerns. According to the RPN Bechara MMA Phase 1 and Phase 2 investigation, the site's results indicate certain areas of concern (See Appendix D). Under Alternative 3, the NFS will provide lands free of hazardous substances. Geogrids would be placed in any areas of concern to delineate the existing land from the material management activities. In addition, the material placed in the MMA would serve as a cover layer to reduce human and wildlife exposure to the existing conditions.

Alternative 4: Bechara B Material Management Area

Alternative 4 involves the use of the Bechara B material management area, which is in the same area as the Alternative 3 Bechara MMA. The Bechara B site would be prepared for material placement, and just like in Alternative 3, measures would be taken to delineate areas of concern from the material management activities. As well as placing material as a cover layer to reduce human and wildlife exposure to the existing conditions.

4.1.12 CLIMATOLOGY

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The No Action Alternative would result in no significant or adverse effects in climate-related patterns.

Alternative 3: Bechara A Material Management Area

Alternative 3 would result in no significant or adverse effects in climate-related patterns.

Alternative 4: Bechara B Material Management Area

Alternative 4 would result in no significant or adverse effects in climate-related patterns.

4.2 HUMAN ENVIRONMENT

4.2.1 CULTURAL RESOURCES

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The USACE has previously determined placement of material from the RPN Project within La Chuleta MMA and the ODMDS has no potential to affect historic properties or cultural resources. La Chuleta MMA consists of man-made land and has undergone prior disturbance related to site preparation for material placement activities. The ODMDS has been previously utilized for dredged material disposal. The USACE maintains its determination of no potential to effect historic properties for the no action alternative.

Alternative 3: Bechara A Material Management Area

Based on the lack of cultural resources and the current use of the area as a significantly disturbed fill placement area, the USACE has determined Alternative 3 has no potential to affect cultural resources or historic properties.

Alternative 4: Bechara B Material Management Area

Based on the lack of cultural resources and the current use of the area as a significantly disturbed fill placement area, the USACE has determined Alternative 4 has no potential to affect cultural resources or historic properties.

4.2.2 AESTHETICS

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, the existing conditions of the project area would remain unchanged. The aesthetic resources of the area, characterized by densely vegetated sites with little topographic relief, would continue to provide "green space" within the greater San Juan metropolitan area. However, the site is currently filled with debris and surrounded by a mix of industrial and urban features, which may impact its aesthetic value. The No Action Alternative would involve the continued use of the ODMDS and La Chuleta for material management. Vessels would travel to the ODMDS from San Juan Harbor, which is a high-traffic area for commercial vessels, and the operations at La Chuleta would include the entry and exiting of heavy equipment for placing material, which would result in short-term adverse aesthetic impacts due to the presence of the heavy equipment. After placement activities are completed, the area would be vegetated.

Alternative 3: Bechara A Material Management Area

Under Action Alternative 3, the aesthetic effects would be moderate and long-term. The material management site would be completely cleared of all vegetation. The construction equipment and activities would also have temporary adverse aesthetic impacts. However, material placement activities will be long-term with the area being vegetated afterwards, mitigating adverse effects. The fill material is expected to be at least 20 feet high, increasing the surface area. This will create a more visible landscape within this commercial and industrial area, compared to the existing conditions.

Alternative 4: Bechara B Material Management Area

The aesthetic impacts of Alternative 4 would be similar to those of Alternative 3 while retaining a wetland portion. It would have initial construction activities impacting aesthetics while culminating with a more visible vegetated landscape after placement activities are complete.

4.2.3 RECREATIONAL RESOURCES

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action Alternative, there would be no impacts to recreational resources in the project area, as the existing conditions would remain unchanged. The Bechara project area currently lacks recreational resources that are accessible and usable by the public, and this situation would continue under the No Action Alternative. The material management site is not designed or maintained for recreational use, and the dense vegetation present at the site limits accessibility and usability, making it unsuitable for recreational activities.

Alternative 3: Bechara A Material Management Area

The Bechara A Alternative would not result in any changes to the existing recreational resources in the project area. The site is not currently used for recreational purposes, and the proposed project would not alter this situation. The dense vegetation and lack of accessibility would continue to limit the usability of the site for recreational activities. As a result, there would be no impacts to active recreational resources in the project area under the Bechara A Alternative.

Alternative 4: Bechara B Material Management Area

The Bechara B Alternative would have similar impacts as Alternative 3, no changes to the existing recreational resources.

4.2.4 FLOOD HAZARDS

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

Under the No Action alternative, no changes would be made to the existing conditions in the Bechara area. The area would continue to experience severe flooding, and the flood hazard would remain a significant threat to the population and economic activity. The existing fill would continue to cut off the natural overland flow of water, causing local flooding. Climate-related effects would continue to exacerbate the flood hazard in the area, increasing the risk of damage to surrounding properties and infrastructure.

Alternative 3: Bechara A Material Management Area

The Bechara A Material Management Area will have beneficial effects in reducing local flooding in the Kennedy Expressway service road area. The proposed project would include measures to allow drainage to occur around the site, mitigating flooding impacts and reducing the risk of local flooding. The design of the material management area would take into account the need for flood resilience and adaptation, incorporating measures to mitigate the effects of flooding and protect the community and environment from the anticipated changes in precipitation and sea level. By allowing for drainage around the site, the Bechara A Material Management Area would help to reduce the flood hazard in

the area, providing a more resilient and adaptable solution to the existing flood control problems.

Alternative 4: Bechara B Material Management Area

The Bechara B Material Management Area is similar to Alternative 3, with the design and implementation of the material management area taking into account the need for flood resilience and adaptation. As discussed in Alternative 3, the material management area would include measures to allow drainage to occur around the site, mitigating flooding impacts and reducing the risk of local flooding. The environmental benefits and drawbacks of this alternative are comparable to those of Alternative 3.

4.2.5 SOCIOECONOMICS

Alternative 1: No Action (Status Quo): ODMDS and La Chuleta

The No Action Alternative would result in the continued use of existing material placement sites, limited to the material approved for disposal in the ODMDS and by La Chuleta design capacity. This alternative would provide protection to structures and infrastructure, ensuring the continuation of benefits to socioeconomic resources such as recreation, tourism, and commercial activities. Although the RPN project may be partially constructed, it would still be expected to have some improvements in the quality of human life by providing improved safety conditions, commutes, and access to locations and services for residences and commercial businesses, resulting in economic benefits.

Alternative 3: Bechara A Material Management Area

The construction of the Bechara A MMA would allow for placement of the material for the RPN Project, accomplishing the foreseen improvements in quality of human life by providing improved safety conditions, commutes, and access to locations and services for residences and commercial businesses. This alternative would also result in improved conditions for fish and wildlife, translating into aesthetic and economic benefits. The project design considered climatology, ensuring the project is resilient for its life cycle, and is not expected to have significant contributions to the climate.

Alternative 4: Bechara B Material Management Area

The construction of the Bechara B MMA would have similar beneficial impacts to those of Alternative 3, allowing for the placement of material for the RPN Project, including improved safety conditions, commutes, and access to locations and services, as well as improved conditions for fish and wildlife.

5 PREFERRED ALTERNATIVE

This section compares the alternatives and provides the basis for the selection of the Preferred Alternative.

5.1 COMPARISON OF ALTERNATIVES AND SELECTION

Regulation, 33 CFR § 230, describes an Environmental Assessment as a document that provides sufficient information on the potential environmental effects of the proposed action and its alternatives for a determination.

Section 4 Environmental Effects provides a detailed discussion of the effects on the existing environment described in Section 3, by the alternatives carried forward from Section 2 for detailed analysis. Effects considerations were used in the selection of Alternatives and addressed in detail in sections 1.5.1, 2.2, and 4. The major environmental resources and potential consequences of the proposed alternatives and relevant resources are summarized in Table 11 for comparison and selection purposes.

TABLE 11. SUMMARY OF EFFECTS COMPARISON BETWEEN THE PROJECT ALTERNATIVES.

Environmental Resource	Alternative 1: No Action (Status quo): ODMDS and La Chuleta	Alternative 3: Bechara A Material Management Area	Alternative 4: Bechara B Material Management Area
Wetlands	No potential effects	Significant long-term impacts to approximately 15.6 acres of jurisdictional wetlands, which would be rendered insignificant as a result of implementing a proposed wetland mitigation and contingency plan. An in-kind and in-watershed wetland mitigation and contingency plan for about 12 acres of restoration and 19 acres of enhancement would be proposed and implemented.	The significant long-term impacts to jurisdictional wetlands in Alternative 3 would be minimize from approximately 15.6 acres to about 11.4 acres. The significant impacts would be rendered insignificant as a result of a wetland and contingency plan. An in-kind and in-watershed wetland mitigation contingency plan for about 10 acres of restoration and 9 acres of enhancement would be proposed and implemented.

Environmental Resource	Alternative 1: No Action (Status quo): ODMDS and La Chuleta	Alternative 3: Bechara A Material Management Area	Alternative 4: Bechara B Material Management Area
Vegetation	No potential effects	Moderate adverse effect on vegetation due to initial clearing and habitat loss. The adverse effect is considered Long-term due to the expected years in operations, although some beneficial effects from reestablishing native upland vegetation would occur after operations.	Same effects as Alternative 3.
Threatened and Endangered: roseate tern, queen conch and palo de rosa	No potential effects	No potential effects	No potential effects
T&E: Antillean manatees and Puerto Rican boa	MANLAA on the manatees during the use for the ODMDS and on the PR boa during operations in La Chuleta.	MANLAA on the manatee during in-water work in the Bechara channel and on the PR boa during construction and operation of Bechara A MMA.	Same effects as Alternative 3.

Environmental Resource	Alternative 1: No Action (Status quo): ODMDS and La Chuleta	Alternative 3: Bechara A Material Management Area	Alternative 4: Bechara B Material Management Area
T&E: Sea turtles, whales, corals, Nassau grouper, giant manta ray, and scalloped hammerhead	MANLAA during the use of the ODMDS	No potential effects	No potential effects
Fish and Other wildlife communities	No potential effects	Temporary adverse effects and Long-term beneficial effects with the revegetation of the area after material placement and with the wetland restoration and enhancement.	Same effects as Alternative 3.
Essential Fish Habitat (EFH)	No potential effect	MANLAA the pup stage of Caribbean reef sharks.	MANLAA the pup stage of Caribbean reef sharks.
Marine Protected Mammals	MANLAA during the use of the ODMDS	MANLAA the manatee during in-water work in the Bechara channel.	Same effects as Alternative 3.
Coastal Barrier Resources	No potential effect	No potential effect	No potential effect
Water quality	No effect. The project would continue to operate within the parameters established by the existing WQC.	A new WQC would be requested, and the construction of the new material management area would operate within the parameters established by the new WQC.	Same effects as Alternative 3.
Air Quality	Temporary adverse impacts due to emissions from transportation and operations related to the existing management areas. Once complete, air quality is expected to revert to background levels, with no significant long-term impacts.	Temporary adverse impacts due to construction, transportation and operations related to the new management area. Once complete, ambient noise is expected to revert to background levels, with no significant long-term impacts.	Same effects as Alternative 3.

Environmental Resource	Alternative 1: No Action (Status quo): ODMDS and La Chuleta	Alternative 3: Bechara A Material Management Area	Alternative 4: Bechara B Material Management Area
Noise	Temporary adverse impacts due to transportation and operations related to the existing management areas. Once complete, air quality is expected to revert to background levels, with no significant long-term impacts.	Temporary adverse impacts due to construction, transportation and operations related to the new management area. Once complete, ambient noise is expected to revert to background levels, with no significant long-term impacts.	Same effects as Alternative 3.
Hazardous, Toxic, or Radioactive Waste	No potential effects	No potential effects. The NFS will provide lands free of hazardous substances. Any areas of concern will be differentiated by installing geogrids to delineate the existing land from the material placement activities.	Same effects as Alternative 3.
Cultural Resources	No potential effects	No potential effects	No potential effects
Aesthetics	Short-term adverse impacts due to the use of heavy equipment for transportation and operation activities related to the existing management areas. Once operations are complete, the material placed would have increased the surface area. The area would be vegetated, creating a natural landscape. No significant long-term impacts in the ODMDS area.	Long-term impacts of construction and operations by clearing of vegetation and use of heavy equipment. Once operations are complete, the material placed would have increased the surface area. The area would be vegetated, creating a natural landscape.	Same effects as Alternative 3.
Recreational resources	No potential effects	No potential effects	No potential effects

Environmental Resource	Alternative 1: No Action (Status quo): ODMDS and La Chuleta	Alternative 3: Bechara A Material Management Area	Alternative 4: Bechara B Material Management Area
Flood Hazards	Long-term adverse effects to the Bechara area. Current conditions lack the natural overland flow of water causing severe flooding in the area. Climate-related effects are expected to exacerbate the flood hazard in the area.	Long-term beneficial effects. Construction of this new material management area would include measures to allow drainage to occur around the site, mitigating flooding impacts and reducing the risk of local flooding.	Same effects as Alternative 3.

5.2 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 4, which consists of constructing of the approximate 56-acre Bechara B Material Management Area. This alternative best meets the project objectives and constraints, is technically sound, and is environmentally acceptable. When compared to Alternative 3, Alternative 4 requires less area, minimizes environmental impacts and reduces impacts to wetlands by approximately 4.2 acres. Less compensatory wetland mitigation would be required for Alternative 4 than for Alternative 3. As Alternative 4 requires less mitigation, it is more feasibility to attain an in-kind and in-watershed mitigation. The proposed mitigation will involve wetland restoration and enhancement, and will be consistent with the principles of no net loss of wetland resources.

The selection of Alternative 4 as the Preferred Alternative is based on a comparison of the environmental factors considered in the analysis, including wetland impacts, water quality, threatened and endangered species, socioeconomics, and aesthetics. Alternative 4 has the least adverse environmental effects, and the Corps has determined that this proposed plan is not contrary to the public interest. The wetland mitigation and contingency plan for Alternative 4 will be designed to avoid, minimize, or compensate for the adverse environmental impacts, and the Corps will coordinate with resource agencies on the design and implementation of the mitigation and contingency measures, with the goal of minimizing damage to wetland resources and achieving no net loss of wetlands. (See Section 2.1.4 for a detailed description of the Preferred Alternative.)

5.3 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Construction of the material management area of Bechara B would have temporary adverse impact on the upland wildlife associated to the area and on some fish species and invertebrate organisms associated with estuarine wetlands. Wetlands would be impacted, and mitigation and contingency measures would be implemented.

5.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. Irreversible commitments associated with the construction of this material management area would be the energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles and water used for dust abatement.

An irretrievable commitment of resources is one which involves the loss in value of an affected resource as a result of the action that cannot be restored. Irretrievable commitments associated with the construction of this material management area would be related to the loss of storage/disposal area for debris and/or fill material as the area would be used to its full capacity.

5.5 CONFLICTS AND CONTROVERSY

Although there is no scientific controversy regarding the potential impacts of the proposed action, the construction of a material management area in the proposed area has sparked debate due to its direct impacts to wetlands in the commercial and industrial area of Bechara in San Juan, PR. The proposed project would result in the loss of wetlands, which has raised reservations among environmentally concerned stakeholders. However, a Wetland Mitigation and Contingency Plan for those impacts is required and has been developed (See Appendix C). Still, the stakeholders concern centers around protecting this scarce wetland ecosystem within a highly commercial/industrial developed area and the need for a material management area to get the foreseen benefits of a flood risk management project for a broader metropolitan area.

5.6 MITIGATION, MONITORING, AND ADAPTIVE MANGEMENT

A Wetland Mitigation and Contingency Plan (See Appendix C) has been developed as part of the proposed action to avoid, minimize, or compensate for the adverse environmental impacts to wetlands. The Corps would coordinate with resource agencies on the design and implementation of the mitigation and contingency measures, with the goal of minimizing damage to wetland resources and achieving no net loss of wetlands. The Wetland Mitigation and Contingency Plan was developed in accordance with the national goal of no net loss of wetland resources, and would include measures to protect, reserve, conserve, and restore wetland resources.

5.7 CUMULATIVE EFFECTS

Cumulative effects can be described as impacts on the environment resulting from the incremental effects of the proposed action when added to other past, present, and reasonably foreseeable future actions (32 CFR § 651.16). Actions by federal and non-federal agencies, as well as private parties must be considered in the project's NEPA document.

Past, present, and reasonably foreseeable actions and plans include the urbanization of San Juan, the previous channelization of the Río Puerto Nuevo and the Río Piedras and the remaining supplemental contracts for this project (See Table 12). In addition, it is expected that the public, Commonwealth of PR and local governments could pursue activities in or around the project area. While the effects of one action may be insignificant, cumulative effects accumulate over time and can result in the degradation of resources. NEPA evaluations are prepared for each major Federal action. Other projects that include obstructions or alterations of navigable waters of the United States or the discharge of dredged or fill material in retained waters are evaluated by the Corps' Regulatory Division pursuant to its permitting authority under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899.

TABLE 12. SUMMARY OF CUMULATIVE EFFECTS.

Resource	Past Actions	Present Actions	No Action Alternative (Alternative 1)	Preferred Alternative (Alternative 4)	Reasonably foreseeable
Wetlands	Long-term adverse impacts to wetlands in the past. During the development of the San Juan Metropolitan area a significant number of wetlands were filled. San Juan has been a major metropolitan area with very few wetlands for decades. In more recent years the area has been used for placing debris that was been spread around during soil movements. Development activities have been proposed for the Bechara area, which have been halted due to the potential wetland impacts.	The Bechara material management site receives storm waters with potential contaminants like oil from a major commercial and industrial roadway during flooding events in the area. Accumulated debris in the area along with storm waters are expected to deteriorate the wetland conditions and water quality of the area.	There would be no effect to wetlands.	The preferred alternative would have significant adverse impacts to the wetlands at the material management site. To mitigate and render these impacts insignificant, a Wetland Mitigation and Contingency Plan has been developed and will be implemented to restore and enhance in-kind and in-watershed wetlands. This restoration and enhancement will be in a conservation easement and result in a more comprehensive restoration as it will connect with a previous mangrove mitigation along the Margarita channel.	No development within the wetland area is expected, but it is expected to continue being degraded from debris, and by invasive species and contaminants associated to equipment and transport of commercial and industrial goods. In view of commercial and industrial pressures, once it's considered no longer capable of natural recovery the area will likely be developed. The RPN project, nor other projects identified in the area are expected to have impacts these wetlands. The wetland restoration and enhancement area would be expected to have less disturbances and likelihood of degradation as it further away from the effects of the commercial and industrial activities and the MMA would work as a buffer zone.
Vegetation	Long-term adverse impacts to vegetation with the development of commercial, and residential infrastructure. San Juan has been a highly urbanized area with small pockets of vegetation for decades and the continued disturbance by natural and	San Juan remains a highly urbanized area with small pockets of vegetation. The Municipality of San Juan has done intermittent vegetation removal events around the area for unknown purposes.	No effects to vegetation, as it does not involve any changes to the existing conditions that would impact vegetation.	Moderate adverse effect to vegetation at the proposed material management site are expected, due to the clearing of vegetation. However, after fill material is placed in the area, vegetation will be seeded and/or planted, and it will	Clearing of vegetation by the Municipality would be expected to continue if the No Action Alternative is selected. If the proposed action is constructed, the vegetation coverage would be expected to return, but the species composition will be dependent on the adaptability to the soil

Resource	Past Actions	Present Actions	No Action Alternative (Alternative 1)	Preferred Alternative (Alternative 4)	Reasonably foreseeable
	anthropogenic activities have allowed for the proliferation of invasive exotic species. The clearing of vegetation by the Municipality has been a common occurrence apparently in the area.			naturally reestablish, reducing the intensity of the adverse effect.	characteristics, compaction, water retention and permeability of the material placed. Clearing of vegetation is not expected to continue and natural vegetation succession is likely to occur. The RPN Project, nor other actions have been identified that would have other foreseeable impacts on the vegetation in the area.
Fish and Other wildlife communities	Likely more abundant and widespread prior to residential, commercial and industrial development. However, the area has been highly urbanized for many decades.	At the mouth of the Río Puerto Nuevo and parts of the Río Piedras that are tidal there is a fishing community. However, areas above the tide line are not connected and likely have low presence of fish and wildlife. In general San Juan is still highly urbanized with little availability for wildlife to thrive. Invasive species, such as the spectacled caiman, are being documented colonizing the area.	No effects to fish and other wildlife communities as existing management areas would be used.	The removal of vegetation and alteration of the channel would displace species temporarily. However, with the restoration and enhancement of wetlands, and seeding of vegetation in the area after operations, no long-term adverse impacts to fish and wildlife species is expected.	Present conditions are likely to persist with No Action. Fish and other wildlife communities will continue using the area for nesting and food. The restoration and enhancement of wetlands, and seeding of vegetation in the area would allow for species to reestablish and recolonize the area. In the No Action and restoration and enhancement native fish and other wildlife are likely to encounter competition from invasive exotic species. The RPN Project, nor other actions have been identified that would impact the existing fish and other wildlife communities.
EFH	Likely more abundant and widespread prior to residential, commercial and industrial development. However, the area has been highly commercially	An ecosystem restoration project currently being constructed in the Caño Martín Peña would enhance EFHs in the San Juan Bay area.	There would be no effects to EFHs by using the existing material management areas.	The filling of landward wetlands in the Bechara area dominated by black and white mangroves may affect, but not likely to adversely affect the pup	If the No Action Alternative is selected, EFHs in the Bechara area won't be affected by the RPN Project or other projects in the vicinity. Implementing the Preferred Alternative will restore and

Resource	Past Actions	Present Actions	No Action Alternative (Alternative 1)	Preferred Alternative (Alternative 4)	Reasonably foreseeable
	and industrially developed for many decades.			stage of Caribbean reef sharks. EFH.	enhance EFH in the area. This combined with the Caño Martín Peña Ecosystem Restoration project would create a more comprehensive system of EFHs in the San Juan Bay Estuary.
Marine Protected Mammals	Marine Protect Mammals are likely to have been more widespread in the past. The San Juan Harbor has been a high vessel traffic port for decades and the commercialization and industrialization of the area may have had long-term negative impacts on their abundance and habitats.	The San Juan Bay area remains a high vessel traffic port and no significant beneficial or adverse effects to marine mammals are expected.	Use of the ODMDS may have temporary minor impacts to marine protected mammal species due to the potential interaction of vessels with marine mammal species along the way.	The Antillean manatee is the only marine mammal identified as potentially present during in-water work activities at the Bechara area and the protective measures identified in the T&E would be implemented to avoid and minimize impacts.	The Caño Martín Peña Ecosystem Restoration project is expected to facilitate the movement, access to desirable habitat and food availability to marine mammals, especially the Antillean manatee. Not implementing the proposed action is not expected to change conditions for marine mammals, however, restoring and enhancing the wetlands could improve water quality and stimulate habitat improvement for the Antillean manatee.
Water quality	The water quality conditions within the project area including the Río Piedras and Río Puerto Nuevo are characterized by frequent exceedances of water quality standards. The water quality parameters that have been exceeded, including nutrients, turbidity, heavy metals, and pathogens. Degradation of the water quality is mainly caused by urban runoff/storm sewers, confined animal feeding	Biannual water quality assessments have reported water quality exceedances for over a decade and increases in the number of parameters in exceedance.	The project will comply with the existing WQC issued on 11 June 1993. Completion of portions of the RPN Project is expected to improve somewhat water quality as flooding events are less likely to occur and introduce into the system pollution.	A new WQC will be requested for the construction of the new material management area. Completion of the RPN Project is expected to improve water quality as flooding events are less likely to occur and introduce into the system pollution. Restoring and enhancing the proposed wetlands would also improve water quality in the area.	The RPN Project along with other flooding and ecosystem restoration projects in the area are likely to continue improving water quality as flooding protection would lessen the introduction of lands pollutants into the aquatic system and restoration projects of natural ecosystems do improve water quality by filtrating, and removing pollutants, excess nutrients and sediment.

Resource	Past Actions	Present Actions	No Action Alternative (Alternative 1)	Preferred Alternative (Alternative 4)	Reasonably foreseeable
	operations, landfills, and onsite wastewater systems.				
Air Quality	The large-scale the commercialization and industrialization of San Juan has likely decreased the air quality over time. The Municipality of San Juan is non-attainment for sulfur dioxide (SO2), since 2018 with the main and most significant source of SO2 emissions being the power plants and industrial facilities.	The San Juan is non-attainment for SO_2, according to EPA NAAQS reporting from year 2018 to present.	The use of ULSD fuel in heavy equipment, as required by Federal diesel standards, would minimize SO2 emissions. Additional measures such as idling restrictions, diesel equipment reduction, and the use of best available technology could further reduce emissions. After construction is completed, air quality is expected to revert to background levels, with no significant long-term impacts on air quality.	Same as no action with some additional temporary adverse impacts from emissions during construction operations. Once construction is completed, air quality is expected to revert to background levels, with no significant long-term impacts on air quality.	There will be temporary impacts to air quality during supplemental construction, but overall, no permanent effects are expected. Improvements in air quality may be seen in the San Juan area with the increased use of liquified natural gas (LNG) in exchange of fossil fuel-fired power generation.
Aesthetics	The area has a natural setting that was significantly filled with material before the 1970s. It has been a green area surrounded by commercial and industrial facilities for decades with once side leading to an upland grassy area.	The Bechara area is a green area that consists of a degraded wetland, with disturbs soils mixed with debris.	Present conditions will continue to prevail.	The site will be cleared and used for clean fill. The surface area will be increase by creating a mound of fill material that will be vegetated once operations are complete. Wetland mitigation would be advantageous in placing the mitigation area in a conservation easement and retaining the aesthetics value of the wetland.	The green area that is the site will continue to shrink with time as commercial and industrial interests continue to expand in the area. Implementing the Preferred Alternative would include restoring and enhancing wetlands that would be placed in a conservation easement, allowing to retaining the aesthetics value of the wetland.
Flood Hazards	Development of the area overs decades have	Flooding continues to occur in the San Juan	The No Action Alternative will have	This new proposed MMA would allow for placement	The RPN Project combined with other anticipated flood protection

Resource	Past Actions	Present Actions	No Action Alternative (Alternative 1)	Preferred Alternative (Alternative 4)	Reasonably foreseeable
	increased the amount of impermeable surface, allowing for flooding occurrence during regular storms. The area has been exposed to major damage during hurricanes.	area with an increase in occurrence and intensity.	some aid in reduction of flooding within the RPN Project area, but not all foreseen benefits may be accomplished without a new MMA.	of material from the RPN Project, which in turn allows accomplishment of the foreseen benefits from completing the project. The proposed MMA would also incorporate design measures to mitigate local flooding.	projects are expected to reduce the impacts from flooding in the San Juan area.
Socioeconomics	Population in the San Juan area and PR overall, has declined and housing units have decreased as well (U.S. Census Bureau 2020). The local economy has been supported by for decades by various businesses and attractions. Local essential services have also been available to the communities for decades. Flooding events have adversely disrupted services and economic activities.	Ongoing flood protection actions are expected to have some improvements in the quality of human life by providing better safety conditions, commutes, and access to locations and services for residences and commercial businesses, resulting in economic benefits.	Same as Present Actions.	Long-term beneficial effects. It would improve safety conditions, commutes, and access to locations and services for residences and commercial businesses.	Partial completion of the RPN Project and future flood protection projects would provide some beneficial effects on the quality of human life by improving safety for communities and commuters, and by enhancing access. Completion of the remaining RPN Project and future flood protection projects would provide all the foreseen beneficial effects on the quality of human life by improving safety for communities and commuters, and by enhancing access.

6 PUBLIC COORDINATION

A Notice of Availability for the proposed FONSI, draft SEA, and associated appendices will be coordinated with pertinent agencies and interested stakeholders for 30 calendar days to allow for review and comment. The FONSI, Final SEA and appendices are to be posted to the Jacksonville District's Environmental planning website, under Puerto Rico:

https://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/. (On that page, click on the "⊞ Puerto Rico" and search or scroll down to the project name.)

7 ENVIRONMENTAL COMMITMENTS

This section documents the environmental commitments to avoiding, minimizing, or mitigating for adverse effects of the Preferred Alternative with the applicable environmental resources.

7.1 ENVIRONMENTAL COMMITMENTS

The Corps will comply with all applicable conditions of the CWA Section 401 Water Quality Certification, CWA 404(b)(1) analysis, Marine Protection, Research, and Sanctuaries Act (MPRSA) Section 103 concurrence, Coastal Zone Management Act (CZMA) Federal Consistency Determination (FCD) concurrence, and NMFS and USFWS consultations for the Preferred Alternative. The RPN project has been previously coordinated in prior NEPA documents (USACE 2025) and for this additional construction, the project will implement standard Puerto Rican boa Conservation Measures, and USFWS standard manatee conditions for in-water work. Other species will receive BMPs as practicable and available. Implementation of design and procedural controls will prevent oil, fuel, or other hazardous substances from entering the air or water. Contractors will develop and implement a spill contingency plan for hazardous, toxic, or petroleum material. Conditions imposed by WQCs will be implemented in order to minimize adverse effects to water quality.

The Corps and its contractors commit to avoiding, minimizing, or mitigating for adverse effects during construction activities. The commitments described in Table 13 will be included in the contract's specifications:

TABLE 13. CORPS' ENVIRONMENTAL COMMITMENTS.

Resource	Corps' Commitment
Wetlands	Adverse effects to wetlands are being minimize, however, significant long-term impacts are anticipated. To mitigate and render these impacts insignificant, a Wetland Mitigation and Contingency Plan (See Appendix C) has been developed and will be implement in coordination with resource agencies. The plan has been designed to achieve the national goal of no net loss of wetland resources and will include measures to restore and protect wetland resources. It will ensure that the mitigation plan is implemented in a manner that minimizes damage to wetland resources and promotes the long-term sustainability of these valuable ecosystems.
Threatened and Endangered Species	A determination of MANLAA has been the result of proposed action evaluation for the Antillean manatee and PR boa. For the other three T&E species evaluated no effect was determined. T&E species will be avoided and/or impacts minimized, as described in Section 4.1.3, by implementation of standard protection conditions and BMPs to ensure that any potential adverse effects to these species are reduced to the maximum extent practicable. The Corps will include applicable Terms and Conditions in the project plans and specifications. Additionally, Puerto Rican boa and Antillean manatee Conservation Measures will be implemented. T&E species protection criteria will be included in the Contractor's Environmental Protection Plan (EPP).

Fish and Wildlife Resources (Other than T&E Species)	Prior to the start of construction, the Contractor will submit their EPP, which requires the Contractor to describe how they will implement the protective measures in the project specifications for species that require specific attention, methods for protection of features (e.g., vegetation, animals, water) to be preserved within authorized work areas, and procedures to be implemented that will provide the required environmental protection to comply with applicable laws and regulations. The Corps reviews and approves the EPP to ensure all minimization measures and environmental protections are considered and will be appropriately implemented.
Water Quality	Implementation of design and procedural controls will prevent oil, fuel, or other hazardous substances from entering the air or water. (For example, procedural controls may include the following: To prevent spills, fuel dispensers shall have a 4-foot square, 16-gauge metal pan with borders banded up and welded at corners right below the bibb. Edges of the pans shall be 8-inch minimum in depth to ascertain that no contamination of the ground takes place. Pans shall be cleaned by an approved method immediately after every dispensing of fuel and wastes disposed of offsite in an approved area. Should any spilling of fuel occur, the Contractor shall immediately recover the contaminated ground and dispose of it offsite in an approved area. Petroleum waste generated shall be stored in marked corrosion-resistant containers and recycled or disposed of in accordance with 40 CFR § 279, State, and local regulations.) All wastes and refuse generated by project construction will be removed and properly disposed. Contractors will implement a spill contingency plan for hazardous, toxic, or petroleum material. Conditions imposed by WQCs will be implemented in order to minimize adverse effects to water quality.

Air Quality	Avoiding and minimizing adverse effects to air quality would be achieved by the implementation of measures to reduce emissions from transportation and operations, including the use of Ultra Low Sulfur Diesel (ULSD) fuel in heavy equipment, idling restrictions, diesel equipment reduction, and the use of best available technology. Additionally, the project must ensure conformance with the approved SIP, NAAQS requirements, and the General Conformity Rule (40 CFR § 51 and 93) for actions occurring in air quality nonattainment areas, such as the Municipality of San Juan. By incorporating these measures into the project construction and operation, the Corps expects to minimize temporary adverse impacts on air quality, with no significant long-term impacts, and ensure protection of public health and welfare, while complying with all applicable federal and state regulations.

8 ACRONYM LIST

Acronym	Definition
AQCR	Air Quality Control Region
ASA(CW)	Assistant Secretary of the Army (Civil Works)
BBA 2018	Bipartisan Budget Act of 2018
BEA	Baseline Environmental Assessment
BMP	Best management practice
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resource System
CFMC	Caribbean Fishery Management Council
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
Corps	U.S. Army Corps of Engineers, Caribbean District
CWA	Clean Water Act
CY	cubic yard
CZMA	Coastal Zone Management Act
DNER	PR Department of Natural and Environmental Resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
ER	Engineering Regulation
ESA	Endangered Species Act
FCD	Federal Consistency Determination
FEMA	Federal Emergency Management Agency
FMC	Fishery Management Council
FONSI	Finding of No Significant Impact
ft	feet/foot (unit of length)
GDM	General Design Memorandum
GHG	Greenhouse gas
HAPC	Habitat Areas of Particular Concern
HTRW	Hazardous, Toxic, and Radioactive Waste
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
LAA	Likely to Adversely Affect
LNG	Liquified Natural Gas
LULUCF	Land Use, Land-Use Change, and Forestry
MANLAA	May Affect, Not Likely to Adversely Affect
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level

MMA	Material Management Area
MMPA	Marine Mammal Protection Act
MMT CO_2e	million metric tons of carbon dioxide equivalent
MPRSA	Marine Protection, Research, and Sanctuaries Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standard
NAVD88	North American Vertical Datum of 1988
NE	No Effect
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
N_2O	Nitrous oxide
NEAT	Net Emissions Analysis Tool
NFS	Non-Federal Sponsor
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen Oxides
NO_2	Nitrogen dioxide
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Unit
O3	Ozone
Pb	Lead
PDC	Project Design Criteria
PDT	Project Delivery Team
PED	Preconstruction Engineering and Design
PM	Particle matter
PR	Puerto Rico
REC	Recognized Environmental Condition
RPN	Río Puerto Nuevo Flood Control
RSL	Risk-Based Screening Levels
SAD	U.S. Army Corps of Engineers, South Atlantic Division
SARBO	South Atlantic Regional Biological Opinion for Dredging and Material Placement Activities in the Southeast United States
SEA	Supplemental Environmental Assessment
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLC	Sea Level Change
SLR	Sea Level Rise
SMMP	Site Management and Monitoring Plan
SO_2	Sulfur Dioxide
T&E	Threatened and Endangered
ULSD	Ultra Low Sulfur Diesel
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service

USVI	U.S. Virgin Islands
VOC	Volatile Organic Compounds
WQC	Water Quality Certificate
WRDA	Water Resources Development Act

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APPENDIX A- 404(B)(1) EVALUATION

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APPENDIX B- CZMA FEDERAL CONSISTENCY

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APPENDIX C- WETLAND MITIGATION AND CONTINGENCY PLAN

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Appendix D- Field Reports

Wetland Jurisdictional Determination Delineation Report,

Phase 1 and 2 Environmental Site Assessment Report and,

MPRSA Section 103 Report

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APPENDIX E- SUPPLEMENTAL EA COMPLIANCE WITH ENVRIONMENTAL LAWS, STATUTES AND EXECUTIVE ORDERS

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APPENDIX F- ENVIRONMENTAL CONSULTATIONS

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APPENDIX H- GREENHOUSE GAS