

**STATE OF NEW YORK**  
**COMMUNITY DEVELOPMENT BLOCK GRANT**  
**DISASTER RECOVERY (CDBG-DR) PROGRAM**  
**SUBSTANTIAL AMENDMENT NO. 28**

**Submitted to HUD June 9, 2021**

**Additions to: New York State Action Plan Incorporating Amendments 8-27**

**In sections: Updated Impact and Unmet Needs Assessment, NY Rising Housing Recovery Programs, NY Rising Community Reconstruction Program, and Rebuild by Design Projects**

**Summary:**

Action Plan Amendment 28 (APA 28) will address the following items:

- A. *Updated Impact and Unmet Needs Assessment:* Changes made to the State's impact and unmet needs assessments for Rebuild by Design to reflect information presented in APA 26 for the Living With the Bay project, and APA 28 for the Living Breakwaters project.
- B. *NY Rising Condominium and Cooperative Program:* Updates to align the NY Rising Condominium and Cooperative Program description with program policies at closeout and to remove a program benefit to better reflect the applicant pool.
- C. *Tottenville Shoreline Protection Project Covered Project:* Update to remove the Tottenville Shoreline Protection Project as a CDBG-DR funded Covered Project.
- D. *NY Rising Infrastructure Program:* Updates to clarify eligible activities in the NY Rising Infrastructure Program and the Suffolk County Coastal Resiliency and Water Quality Improvement Initiative Covered Project funded by the Program.
- E. *Living Breakwaters Rebuild by Design Project:* The State is providing updates on the Living Breakwaters RBD project following a value engineering and rescoping process of the breakwaters component, the addition of social resiliency components and the removal of the Water Hub component. The State prepared an updated Benefit Cost Analysis to reflect the scope, benefits, costs, and other details of the project included in this Action Plan Amendment. The updated Benefit Cost Analysis is a separate document that can be accessed at [https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/20210504\\_LivingBreakwaters\\_UpdatedBCA\\_English.pdf](https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/20210504_LivingBreakwaters_UpdatedBCA_English.pdf)

Changes are indicated in red text.

## A. Updated Impact and Unmet Needs Section

**Description of changes:** Changes made to the State’s impact and unmet needs assessments for Rebuild by Design to reflect information presented in APA 26 for the Living With the Bay project, and APA 28 for the Living Breakwaters project, updating previous analyses provided by New York State.

From page 52 of the New York State Action Plan:

### Rebuild By Design Unmet Needs

As noted in the October 16, 2014, Federal Register Notice, HUD allocated a portion of the funds for each awarded RBD project – Living Breakwaters: Tottenville Pilot and Living with the Bay: Slow Streams. The Notice requires grantees to identify any potential gap or shortfall in the RBD funding and provide a strategy and description of funds anticipated to be generated or secured in leveraging the CDBG-DR allocation for RBD project completion as well as any additional CDBG-DR funds the grantee anticipates dedicating to the RBD project. Based on the estimated budgets provided in the RBD plans, the State identified a total preliminary funding gap of \$13.1 million for the Living Breakwaters project on Staten Island. The State is currently under~~wentgoing~~ a two pronged approach to review and fill this gap.

First, the State ~~is~~ analyz~~ing~~ the budgets provided by the RBD teams and calculat~~ing~~ any additional planning and program delivery required to fully execute the project and meet the requirements set out by HUD. The planning and scoping through the environmental review process ~~will~~ help~~ed~~ shape the needs of the project ~~not outlined in the current plan~~.

Once a firm cost for the project ~~was~~ clear, the State ~~will begin~~~~began~~ to execute the strategy outlined in this Action Plan to leverage funds to fill the gap left in the budget. As the State moves through the leveraging process, the State ~~will~~ reassess~~ed~~ the project as needed to identify areas where funding is secured and where funding gaps still remain. The State will work together with stakeholders and federal partners to ensure the strategies in place lead to successful implementation of the project.

Having ~~passed the 30% completed the~~ design phase ~~and value engineering process~~, the Living Breakwaters project’s total budget ~~as of APA 28~~ is now ~~estimated to cost~~ \$10775.5 million, resulting in a funding gap of \$4745.5 million. ~~This funding gap will be covered by additional State funding, resulting in \$0 in unmet need for the project.~~

~~As explained in APA 26, the State has identified approximately \$22 million in ~~no~~ unmet need for Living with the Bay, related to the Long Beach WPCP focus area. The proposed subrecipient intends to address the remaining unmet need through an application for additional State grants and a FEMA PA 406 Mitigation grant. The proposed subrecipient has made commitments to bridge any shortfall if grants are not secured.~~

As the Living with the Bay project proceeds through the design phase, the State will monitor the project’s budget to reassess unmet needs. The State will undertake the leveraging process outlined in this Action Plan for any unmet needs identified in the future.

As a result, the State includes a \$~~21~~45.5 million dollar gap in its broader estimate of remaining infrastructure needs (Table 28).

Table 28: Unmet Needs for the State’s RBD Projects

RBD Project	Total Project Cost	October 16 <sup>th</sup> 2014 Allocation	Unmet Need
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Living with the Bay	\$ <del>18925.20</del>	\$125.0	\$ <del>21.50</del>
Living Breakwaters	\$ <del>10775.5</del>	\$60.0	\$ <del>045.5</del>
Total	\$ <del>296,200.5</del>	\$185.0	\$ <del>2145.5</del>

Source: Programmatic Data

## B. NY Rising Condominium and Cooperative Program

**Description of changes:** Updates to align the NY Rising Condominium and Cooperative Program description with program policies at closeout. Additionally, as this program is now closed and no applicants were low- or moderate-income, the Low- and Moderate-Income Allowance is being removed since this benefit was inapplicable.

From page 65 of the New York State Action Plan:

### NY Rising Condominium and Cooperative Program

**Activity Type:** Repair, reconstruction, and mitigation of residential condominium & cooperative structures.

**National Objective:** Low- and Moderate- Income or Urgent Need

**Geographic Eligibility:** Disaster-declared counties outside of New York City

**Eligible Activity:** Sec. 105 (a) (4) 42 U.S.C. 5305(a)(4)

**Eligible Applicants:** This Program is available to Condominium Associations; ~~and Cooperative Boards; Condominium Unit Owners, and Cooperative Shareholders~~ whose condominium or cooperative property is located outside of New York City and sustained damage from Hurricane Irene, Tropical Storm Lee, and/or Superstorm Sandy.

**Program Description:** The NY Rising Condominium & Cooperative Program includes the following eligible funding activities:

- **Reimbursement:** The Program provides reimbursement for eligible costs incurred by Condominium Associations/Cooperative Boards ~~and unit owners/shareholders~~ for completed structural repair or reconstruction activities for the Condominium or Cooperative property.
- **Repair:** The Program pays for approved and eligible costs to complete repairs to Condominium or Cooperative properties that have not yet been completed.
- **Resiliency Measures:** The Program pays for resiliency measures such as mandatory elevation of the structure when feasible for substantially damaged/improved properties located in the 100-year floodplain, as well as bulkhead repairs and other feasible storm mitigating measures, which help minimize future flood damage to storm-damaged Properties.

**Maximum Award:** Following the analysis of the needs of the affected communities and the availability of funding, the Program set the following cap amounts and allowances:

- **Base Cap:** The base cap for the total amount for a Condominium Association or Cooperative Board is \$5,000,000 which includes an individual unit cap of \$300,000. ~~LMI unit increase may raise the base cap over the \$5,000,000 threshold.~~

- ~~Low and Moderate Income Allowance: Unit owners or shareholders who are identified to be low or moderate income (total household income is less than or equal to 80% of area median income) will be deemed low to moderate income. Each LMI unit will receive \$50,000 increase in award cap.~~
- Elevation Allowance: Condominium Associations or Cooperative Boards with damaged properties within the 100-year floodplain and which are substantially damaged/improved are required to elevate the structure and, if the elevation is feasible, are eligible for up to a \$1,000,000 increase in the base cap amount.

The Program covers costs for the repair or replacement of damage to real property including mold remediation, replacement of disaster-impacted non-luxury residential appliances, and environmental and health hazard mitigation costs related to the repair of the disaster-impacted property.

Optional mitigation measures are available for Applicants who are eligible participants in the NY Rising Condominium & Cooperative Program whether or not they are within the 100-Year Floodplain. Such mitigation measures include, but are not limited to, the following:

- Elevation of electrical systems and components;
- Securing of fuel tanks;
- Use of flood resistant building materials below base flood elevation (retrofits to be limited in scope to be cost effective);
- Installation of flood vents;
- Installation of backflow valves; and,
- Installation of roof strapping.

**Eligibility Criteria:**

- The applicant will be the primary payee on all flood and other insurance for the areas funded by GOSR. This can be the Condominium Association, ~~or the Cooperative Board or the unit owner/shareholder.~~
- The applicant must be responsible for all structural repairs on the areas funded by NY Rising.
- Applicants must complete a process to verify previously received disaster recovery benefits. Unmet need is determined after accounting for all federal, State, local and/or private sources of disaster-related assistance, including, but not limited to, homeowners and/or flood insurance proceeds per the Stafford Act.

**C. Tottenville Shoreline Protection Project Covered Project**

*Description of changes:* The State is removing the Tottenville Shoreline Protection Project (TSPP) as a CDBG-DR funded Covered Project. The City of New York is pursuing additional funding to support the project through FEMA’s Building Resilient Infrastructure and Communities (BRIC) grant program.

From page 87 of the New York State Action Plan:

~~Covered Infrastructure Project~~

~~Activity Name: Tottenville Shoreline Protection Project (TSPP)~~

~~Eligible Activity Type: Public facilities, reconstruction/rehabilitation of a public park~~

~~National Objective: Low and Moderate Income or Urgent Need~~

~~Eligible Activity: 105(a)(2) Public Facilities~~

**Program Description:** Superstorm Sandy's tropical storm force winds caused particularly intense waves, flooding and erosion along the south shore of Staten Island, including the community of Tottenville which is the southernmost point on the island. The peak storm surge in Tottenville measured approximately 16 feet, and resulted in the destruction of many homes in the community. The New York City Department of City Planning's (NYCDCP's) *Urban Waterfront Adaptive Strategies* study (June 2013), concluded that the South Shore of Staten Island is particularly vulnerable to erosion during extreme events, as well as on a day to day basis. The need for this project is further highlighted by the *New York City Hazard Mitigation Plan* (2014), which states "coastal erosion can cause extensive damage to public and private property because it brings structures closer to the water's edge. If erosion is not mitigated, the structures will become inundated with water, resulting in damage or destruction."

The Staten Island New York Rising Community Reconstruction (NYRCR) Planning Committee, working collaboratively with the NYC Department of Parks and Recreation (NYCDPR) and the New York City Mayor's Office of Recovery and Resiliency, developed the TSPP which will provide shoreline protection features as a coastal resiliency strategy for the Tottenville area. The project area extends from approximately Carteret Street to Page Avenue, an area which is within NYCDPR's Conference House Park (CHP). The TSPP is being developed in coordination with the HUD funded Rebuild by Design 'Living Breakwaters Project', which is largely focused on the offshore area immediately adjacent to the CHP. The two projects will complement each other to reduce risk, enhance ecology, and foster community and stewardship along the Tottenville shoreline. The environmental review of both projects has been jointly addressed in a single Environmental Impact Statement (EIS). The Living Breakwaters Project is being designed by a separate design team than the TSPP, however the design will be coordinated given their overlapping objectives and functions. The total project cost of the TSPP is \$38.5 million, including \$13.3 million of CDBG DR funding. The remainder of the funding will come from New York State and the City of New York. As the TSPP and the Living Breakwaters Projects meet the definition of 'related infrastructure projects', the combined cost of each (\$38.5 million and \$74 million, respectively) exceeds HUD's threshold for the Covered Project definition.

The TSPP has been designed to withstand storm wave action and overtopping of the shoreline structures (incorporating a sea level rise of 30 inches), and to reduce the risk of coastal flooding. The TSPP's continuous series of on shore risk reduction measures will augment the wave attenuation and risk reduction measures provided by the Living Breakwaters Project. The TSPP involves a comprehensive design of shoreline treatments that respond to the specific characteristics of the approximately 1.5 mile long project site (See Figure 1). The shoreline risk reduction measures include:

- An Earthen Berm—From approximately Carteret Street to Brighton Street through a wooded portion of CHP, extending approximate 948 linear feet at a height of between approximately 1 and 7.5 feet above grade.
- Eco Revetments—Between Brighton and Manhattan Streets 338 linear feet along the landward edge of a delineated wetland, and between Loretto St. and Sprague Avenue, 396 linear feet.
- Hybrid Dune/Revetment—Between Manhattan and Loretto Streets extending approximately 937 linear feet and at an elevation of 14 feet.
- Raised Edge (revetment and trail)—From Sprague Avenue to Page Avenue for approximately 2,536 linear feet, to control erosion while accounting for future sea level rise.

Transition nodes will connect certain project elements such as Loretto Street and Sprague Avenue. The entire system will include native plantings and green infrastructure as well as a continuous trail system along the shoreline.

**Figure 4: Shoreline Risk Reduction Measures**



**EARTHEN BERM**



**HYBRID DUNE / REVETMENT**



**ECO-REVETMENT**



**RAISED EDGE**



**Geographic Eligibility:** The project is located in the Tottenville community of Richmond County. The project area is exposed to extreme wave action and coastal flooding during hurricanes and other severe storm events due to its location at the mouth of New York Bight, which funnels storm-driven waves into New York Harbor, Raritan Bay, and the shoreline of Staten Island. This area was once the home of a rich marine environment but over the last century has suffered significant land loss and habitat degradation. Tottenville, a town which thrived in the 19<sup>th</sup> century based on its oyster harvesting economy, now completely lacks these species. The project area has experienced dramatic net erosion between 1978 and 2012—in the southern portion of CHP the erosion rate has been over 3 feet per year.

In 2014, the New York City Economic Development Corporation (NYCEDC) announced its intention to study and identify high-risk shorelines citywide that are most vulnerable to sea level rise and erosion, and then prioritize those shorelines for future design and construction of resiliency measures. This study analyzed approximately 43 miles of at-risk shoreline across the five boroughs, and included the South Shore of Staten Island, with a goal to evaluate localized measures to reduce coastal risk, make recommendations for resiliency investments, and coordinate with other local coastal protection actions. As part of this coordination, coastal strategy recommendations for the area in Tottenville identified by the NYCEDC study along the eastern stretch of CHP have been incorporated into the TSPP.

CHP is a 265-acre park under the jurisdiction of NYCDPR. Extensive natural areas make up the park, including large tracts of maritime forest, creeks, ponds, bluffs, coastal wetland and beaches. A man-made temporary dune, installed following the damage from Superstorm Sandy, provides interim erosion control and coastal flood risk reduction from approximately Swinnerton Street to Sprague Avenue.

**Use of Impact and Unmet Needs Assessment:** The damage to the Tottenville community was recognized in the State's post-Sandy assessment of unmet recovery needs. The TSPP is consistent with the State's risk

analyses, including the comprehensive risk analysis, as this project aligns with GOSR's strategy of drawing upon science-based risk to guide the location and type of infrastructure projects implemented to protect vulnerable coastal communities from future storms. The TSPP has been designed to withstand storm wave action and overtopping of the shoreline structures (resilient to sea level rise of 30 inches), and provide some level of risk reduction from coastal flooding. The TSPP utilized several modeling efforts to design the four main elements of the project, according to the specific characteristics of each section of the shoreline—the earthen berm, hybrid dune/revetment system, eco-revetments, and raised edge (revetment with trail). Using collected cross-shore transect data, the existing condition of Tottenville beach at each transect was modeled using USACE's SBEACH model, a numerical model that simulates beach profile change by predicting beach, berm, and dune erosion caused by storm waves and water levels. The condition of the shoreline (overtopping, run-up, and scour) at each transect was simulated under various storm conditions. Each simulation included consideration of sea level rise. Additional models were used to simulate sediment settlement, slope stability, and drainage and seepage patterns at each of the project's components.

The TSPP is being designed cooperatively with NYCDPR in an effort to ensure that CHP is better able to withstand coastal flooding and to curtail the significant erosion that has affected the park. By providing for continuous access along the park with a pathway that is integrated with each of the shoreline treatments, the project will expand public use and connection to the waterfront and awareness of both the Living Breakwaters and the TSPP resiliency efforts.

**Transparent and Inclusive Decision Process:** The Staten Island NYRCR planning process provided the genesis of the TSPP. The Staten Island NYRCR Planning Committee was active 2013–2014 and held a series of public meetings to generate and focus priority projects for inclusion in GOSR's NYRCR Program. In 2014, the complementary Living Breakwaters Project was conceptualized and vetted by a range of community stakeholders. Because of their layered benefit and close proximity, in 2015 GOSR established the Community Advisory Committee (CAC) to provide input on the plans for both the TSPP and the Living Breakwaters Projects. The CAC is comprised of 22 citizens, largely from Tottenville and the wider Staten Island community, and also includes educators and concerned environmentalists. The CAC typically meets quarterly and all presentations made at CAC meetings are made available on GOSR's website at <https://stormrecovery.ny.gov/LBWCAC>.

Also because of the close relationship between the TSPP and the Living Breakwaters Projects—in terms of purpose, need and design—the two projects are being evaluated jointly in one EIS. Concurrent with ongoing consultation with various federal, state and local agencies, the EIS process began with the release of a draft scoping document which was presented at a public hearing in April 2016. After comments were heard and responded to, a Draft EIS was released and a public hearing held on April 26, 2017. Comments were received from government agencies and from the general public through May 8, 2017. The Final EIS was released on June 13, 2018 and the Record of Decision was issued on August 31, 2018.

**Long-Term Efficacy and Fiscal Sustainability:** The project is designed to make the park more resilient, to counteract erosion of the beachfront and, by so doing, improve the safety of nearby physical shoreline, recreational assets, and homes. The TSPP utilizes risk management tools, including the modeling activities mentioned above, to reflect changing environmental conditions. The Project will also improve public access to the park in general and to the shoreline treatments and off-shore resiliency features in particular. The TSPP improvements will reduce the vulnerability of the park and neighborhood behind it and enhance CHP's role as a public amenity.

The funding for the TSPP has been committed from GOSR's CDBG-DR allocation with additional commitments from the State and City of New York. GOSR and NYCDPR entered into a Memorandum of Understanding in June 2015 providing for the joint design and implementation of the TSPP. Design is therefore being done in close collaboration with NYCDPR which is expected to construct and will

~~ultimately own and manage the improvements. All design elements of the project have been and will continue to be developed in a manner consistent with NYCDPR standards for construction and for long-term maintenance. Monitoring and maintenance is not expected to be more than typical for similar facilities in NYCDPR's portfolio, and NYCDPR is committed to taking on the on-going maintenance of the project including the environmental monitoring required in the wetland enhancement area. NYCDPR will monitor the project on a routine basis as required by the city-wide Waterfront Inspection Program managed by NYCEDC. This will largely consist of typical grounds maintenance, but will also involve surveys of certain beach-nesting birds.~~

~~**Environmentally Sustainable and Innovative Investments:** The TSPP has been designed to maintain its structural integrity during severe storms of up to the 100-year level including 30 inches of sea level rise (likely to occur sometime between the 2050s and 2080s). The TSPP has been informed by analyses of risk for coastal communities, including through mapping and modeling by the DOS and RISE which incorporated rigorous, science-based predictions regarding sea level rise and other climate risk factors. Each of the segments of the shoreline treatment is especially designed to reduce wave heights during certain storm events assuming 30 inches of sea level rise. The earthen berm is designed to reduce wave heights by approximately 10 and 15 percent for 100-year and 50-year events, respectively. The eco-revetment (between Loretto Street and Sprague Avenue), is designed to reduce wave heights by approximately 25 percent for both 100-year and 50-year events. Due to its higher crest elevation, the proposed hybrid dune/revetment is designed to reduce wave height during a 100-year event with 30 inches of sea level rise by approximately 45 percent. The proposed raised edge component of the Shoreline Project (revetment and trail) is projected to reduce wave heights by approximately 5 to 10 percent 30 feet inland of the raised edge during the 100-year and 50-year severe storm events and by approximately 20 to 35 percent for the 25-year and 10-year events when including future sea level rise of 30 inches.~~

~~While the TSPP is not designed to avoid flooding caused by severe storms, it will reduce or delay flooding of inland areas during certain storm events and reduce damage to inland structures. It is expected that during coastal storm events, in cases where over-topping from storm surge does not occur, some level of risk reduction from coastal flooding would be provided by the project. While the shoreline treatments would be porous in nature, seepage through them is likely to be slowed and of lower volume than with free-flowing water entering the land without the project. In summary, the TSPP improves natural defenses against extreme weather, and does so in a way appropriate for the project area.~~



## D. NY Rising Infrastructure Program

**Description of changes:** Updates to clarify eligible activities in the NY Rising Infrastructure Program and the Suffolk County Coastal Resiliency and Water Quality Improvement Initiative Covered Project funded by the Infrastructure Program.

From page 92 of the New York State Action Plan:

### NY Rising Infrastructure Program

**Activity Type:** Public Facilities and Local Government Support

**National Objective:** Low- and Moderate- Income or Urgent Need

**Eligible Activities:** Acquisition 105(a)(1); Public facilities 105(a)(2); Code Enforcement 105(a)(3); Clearance 105(a)(4); Public services 105(a)(8); Non-federal share 105(a)(9) Planning 105(a)(12); Energy Use Strategies 105(a)(16); Assistance to private, for-profit entities 105(a)(17); 42 U.S.C. 5305(a)(1)(2)(3)(4)(8)(9)(12)(16)(17); Economic Revitalization FR-5696-N-01 (VI) (D);

From page 98 of the New York State Action Plan:

### Covered Infrastructure Project

**Activity Name:** Suffolk County Coastal Resiliency and Water Quality Improvement Initiative

**Eligible Activity Type:** Essential public services, acquisition, construction/reconstruction of water/sewer lines or systems, rehabilitation/reconstruction of residential structures, and rehabilitation/reconstruction of a public improvement

**National Objective:** Low- and Moderate- Income or Urgent Need

**Eligible Activity:** 105(a)(1)(2)(4)(8)(17); 42 U.S.C. 5305(a)(1)(2)(4)(8)(17)

**Eligible Applicants:** Both low- and moderate-income households and households in the project area

From page 103 of the New York State Action Plan:

### Covered Infrastructure Project

**Activity Name:** Bay Park Wastewater Treatment Plant

**Eligible Activity Type:** Public facilities, construction/reconstruction of water/sewer lines or systems, and rehabilitation/reconstruction of a public improvement

**National Objective:** Low- and Moderate- Income or Urgent Need

**Eligible Activity:** 105(a)(2)(4)(8)(9)(16)(17); 42 U.S.C. 5305(a)(2)(4)(8)(9)(16)(17)

From page 106 of the New York State Action Plan:

### Covered Infrastructure Project

**Activity Name:** Roberto Clemente State Park Shoreline and Park Improvements

**Eligible Activity Type:** Public facilities, reconstruction/rehabilitation of a public park

**National Objective:** Low- and Moderate-Income

**Eligible Activity:** 105(a)(2) Public Facilities; [42 U.S.C. 5305 \(a\)\(2\)](#)

## **E. Living Breakwaters Rebuild by Design Project**

**Description of changes:** The State is providing updates to the Living Breakwaters Rebuild By Design project, including updates to information required by HUD's October 16, 2014 and August 15, 2016 Federal Register Notices. The State also prepared an updated Benefit Cost Analysis (BCA) of the Living Breakwaters project to reflect the updated scope, benefits, costs, components and other details of the project included in this Action Plan Amendment. The updated BCA can be reviewed at [https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/20210504\\_LivingBreakwaters\\_UpdatedBCA\\_English.pdf](https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/20210504_LivingBreakwaters_UpdatedBCA_English.pdf).

This Action Plan Amendment's updates include scope updates as the project approaches the construction phase following a value engineering and rescoping process of the original final designs for the breakwaters. This value engineering process was necessary because the bids received in response to the procurement process on the original designs were over 20% higher than the engineering estimates, resulting in a large funding gap.

Faced with this fiscal constraint, the State engaged in a value engineering and rescoping process to ensure the project could be implemented while continuing to meet the original proposal's objectives of increasing physical, ecological, and social resiliency through innovative coastal green infrastructure. The value engineering effort and subsequent procurement process resulted in new bids that were approximately \$25 million lower than those received through the original procurement process. This Action Plan Amendment updates information about the breakwaters to reflect the results of the value engineering process, including updated project modeling undertaken to confirm the Project's feasibility and effectiveness in providing protection against current and future threats and hazards, including future risks associated with climate change.

Through this Action Plan Amendment, the State is adding educational walking tours, annual shoreline monitoring events, and a Living Breakwaters installation at Conference House Park, adjacent to the project site, as social resiliency and educational components of the project. These components are in addition to the existing school curriculums focused on the ecological benefits of oyster installations and associated field work opportunities. The State is removing the Water Hub component from the Living Breakwaters project. Implementation challenges identified through a feasibility study, and the fiscal constraints discussed above have made this component infeasible. The State will meet the educational and social resiliency objectives of the project through the previously mentioned components.

The State will replace Appendix D with the updated BCA to ensure consistency following HUD's approval of APA 28.

*From page 112 of the New York State Action Plan:*

## Rebuild by Design Projects

After Superstorm Sandy’s devastating sweep over the northeastern part of the United States, President Obama created the Superstorm Sandy Rebuilding Task Force (the Task Force) with the purpose to redesign the approach to recovery and rebuilding through regional collaboration and emphasis on the growing risks of climate change. The Task Force partnered with HUD to initiate the Rebuild by Design (RBD) competition, which was devised to invite the world’s most talented designers and engineers to bring their expertise in flood mitigation and coastal resiliency to Sandy-impacted regions. The six RBD competition finalists were announced on June 2, 2014. Two of the six projects were awarded to New York State to implement.

Table 36: New York State awarded proposals

Project	Location	Total Project Cost	CDBG-DR Allocation
Living Breakwaters: Tottenville Pilot	Richmond County	<del>\$70</del> \$107,000,000*	\$60,000,000
Living with the Bay: Slow Streams	Nassau County	\$189,226,000**	\$125,000,000

~~\*At preliminary 60~~

~~\*Based on value engineering estimates post 100% design; \*\* The design for each component of LWTB ranges from preliminary designs through 100% (final) designs~~

The goals of New York State’s RBD implementation plan are to make communities in Richmond County (Staten Island) and Nassau County (Long Island) more physically, economically, and socially resilient in the face of intense storm events. Both proposed projects represent innovative, flexible, and scalable interventions that could be replicated in other parts of the State, nation, and globe. Each project must undergo a rigorous environmental review and permitting process, which will include the assessment of potential alternative designs and/or projects.

Monitoring plans for large scale projects such as RBD must be developed in coordination with federal and State permitting agencies, as well as following a rigorous data collection and data review program during design. The monitoring plan strategy for Living Breakwaters: Tottenville Pilot and Living with the Bay: Slow Streams is described in the project section below.

### Living Breakwaters: Tottenville Pilot

**National Objective:** ~~Low and Moderate Income and~~ Urgent Need

**Eligible Activity:** Rebuild by Design

**CDBG-DR Allocation:** \$60,000,000

**Project Description:** Richmond County (Staten Island), one of the City of New York’s five boroughs, sits at the southernmost part of New York State. The island is at the mouth of the New York Bight—the waters off the Atlantic Coast extending from the Cape May Inlet in New Jersey, to Montauk Point on the eastern tip of Long Island. The tidal waters surrounding the Borough shape its myriad industries; transportation, housing, and culture. In October 2012, Superstorm Sandy devastated Staten Island’s east and south shore neighborhoods. The driving wave action bombarded the coastline, damaging or destroying an unprecedented number of Staten Island homes and businesses, resulting in loss of life and significant harm to the local economy. Tottenville, a community at the southernmost point of Staten Island, experienced some of the most destructive waves in the region during Superstorm Sandy. Historically known as “The Town the Oyster Built,” the community was once protected by a wide shelf and series of oyster reefs, much

of which was harvested by local oystermen. Today, much of the shore of Staten Island is void of these natural systems, and remains exposed to wave action and coastal erosion.

**Figure 5: Map Of Staten Island And New York Bight**



Living Breakwaters: Tottenville Pilot (Living Breakwaters) is an innovative coastal green infrastructure project that aims to increase physical, ecological, and social resilience. The project is located in the waters of Raritan Bay (Lower New York Harbor) along the shoreline of Tottenville and Conference House Park, from Wards Point in the Southwest to Butler Manor Woods in the Northeast. The project area is a shallow estuary that has historically supported commercial fisheries and shell fisheries. This project also fulfills New York City’s Resilience Plan Coastal Protection Initiative 15<sup>ii</sup>.

The Living Breakwaters project consists of both on-shore and off-shore components:

- (1) A system of specially designed off-shore breakwaters which will attenuate waves and counteract beach erosion and which include materials and features specially designed to promote biological activity and promote recruitment of marine species;
- (2) Ecological enhancement and activities, including supporting future oyster restoration including: oyster cultivation, (including hatchery expansion and remote setting facility), shell collection and curing, and the installation of permitted oysters on the breakwaters in addition to oyster nurseries in Lemon Creek and Great Kills Harbor that create and enhance ecological connectivity across sites for oyster larvae and mobile species (such as fish and crabs) that inhabit them;
- (3) ~~A Water Hub: A public space~~ Social Resiliency and Educational activities, including school curriculums focused on the ecological benefits of oyster installations, resiliency and how the Living Breakwaters project works and associated field work opportunities for local and citywide students, as well as educational walking tours, annual shoreline treatments that will enhance physical space for access, monitoring events, and a Living Breakwaters installation at Conference House Park, adjacent to the waterfront as well as project site. These activities will provide a location for orientation, education and informational activities related to shoreline resiliency, ecological and oyster restoration and the breakwaters; and

- (4) Shoreline restoration to provide sand fill to a segment of the beach which has experienced significant erosion up to and including Superstorm Sandy (at the rate of approximately 2 feet per year from 1978 to 2012).

~~In addition to the Living Breakwaters project components described above, an additional project was proposed by the Staten Island New York Rising Community Reconstruction (NYRCR) Committee Plan. Working collaboratively with the NYC Department of Parks and Recreation (NYCDPR) and the New York City Mayor's Office of Recovery and Resiliency, the Tottenville Shoreline Protection Project (TSPP) will provide shoreline protection features as a coastal resiliency strategy for the Tottenville area from approximately Carteret Street to Page Avenue. The TSPP is a separate project from Living Breakwaters, but the two projects will complement each other to reduce risk, enhance ecology, and foster community and stewardship along the Tottenville shoreline. The environmental review of both projects is jointly addressed in a single Environmental Impact Statement (EIS). The TSPP will be designed by a separate design team from the Living Breakwaters project however, the design of the two projects will be coordinated given their overlapping objectives and functions.~~

~~The Living Breakwaters project will significantly complement the TSPP noted above. Throughout the development of the Living Breakwaters project, the design team worked closely with many community partners, including the Staten Island NYRCR Planning Committee. The Living Breakwaters project design team will work closely with the design team of the TSPP. The TSPP will include a system of shoreline protection treatments including an earthen berm, stone core sand capped hybrid dune/revetment, eco-revetments and a raised pathway. The project will support the goals of Living Breakwaters — helping to protect communities from damaging wave action and erosion as well as improving access to the waterfront. While independently valuable, the TSPP will be further strengthened by the Living Breakwaters project, as the breakwaters will protect the dunes, the adjoining beach area, and other on-shore project elements against harmful effects caused by coastal erosion. As mentioned above, the State will be coordinating design efforts of both the Living Breakwaters and the TSPP with various New York City agencies and through the environmental review.~~

Since the approval on April 13, 2015 by HUD of New York State's Action Plan Amendment 8 (APA 8), the Living Breakwaters project has progressed from conceptual plan to a preliminary 60% completed design phase. Throughout the planning, design and engineering, the State has worked closely with the design teams as well as with the State's environmental team to further identify the technical challenges and solutions needed to construct this ground-breaking project. The State has consulted various federal, State and city agencies, as well as non-governmental organizations, on project design. The State has filed for the done all work necessary to secure permits to construct the breakwaters component of the Living Breakwaters project and has published/issued the Draft Record of Decision and Finding Statement of Final EIS for the project. On April 1, 2015, the State published the *Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, NY* – Environmental Impact Statement Draft Scope of Work<sup>iii</sup> (Draft Scope of Work). Along with the opportunity for the public to provide input on APA 8, the State held two public hearings on the Draft Scope for Work for the project. On April 1, 2016, the State published the EIS Final Scope of Work<sup>iv</sup> and provided responses to all comments received through the public comment process. On March 24, 2017, the State published the Draft EIS, offering interested stakeholders the opportunity to comment through May 8, 2017. The Final EIS is/was made available for public review on June 15, 2018 and the Record of Decision and Finding Statement was issued on August 31, 2018.

In December 2019 the New York State Department of Environmental Conservation (DEC) issued its permit for the breakwaters component of the Living Breakwaters project. On October 12, 2018 the United States Army Corp of Engineer (USACE) issued a public notice regarding the project's permit application and the public was given an opportunity to provide comments. Following this public comment process, the permit conditions for the breakwaters were approved by USACE and the permit was issued in Q1 2021.

The permitting process for the oyster installation component of the project began in Q1 2021, and, as of APA 28, DEC and USACE permits for this component are expected to be filed in Q3 2022. Construction of the breakwaters component can begin before the end of calendar year 2017 or Quarter 1 2018. oyster installation permits are received.

In addition, the State formed a Citizens Advisory Committee (CAC) for the Living Breakwaters project to provide an additional opportunity for the public to advise the State on design of the project.

Throughout the design phase, the State expanded its technical team to include an independent peer reviewer on all design elements of the project and deliverables by the design team. In 2018, the State hired a breakwater-experienced construction management team to assist it in finalizing the design, hiring the contractor and eventually overseeing the construction of the Living Breakwaters.

### *Breakwaters System*

The off-shore breakwaters consist of a series of ecologically enhanced breakwater segments off the southwestern tip of Staten Island. Made of a combination of hard stone and biologically enhanced concrete armor units, the breakwaters are rubble mound structures. The system has been designed to reduce or reverse erosion (grow beach), and reduce coastal storm risk through wave attenuation.

A network of ecological enhancements integrated into the breakwater's physical structure ("reef streets," "reef ridges" and water retaining elements) and targeted material selection (bio-enhancing concrete) are aimed to increase biodiversity by providing various ecological niches and improving the ecosystem services provided by the structures. The project will also include ecological restoration activities by creating new habitat in Raritan ~~bay~~ Bay, which would also be amenable to active restoration of bivalves such as eastern oysters (*Crassostrea virginica*) on and within the breakwaters, as well as ~~an oyster nursery system (floats, anchors and oyster trays) and bottom~~ placement of "spat" (juvenile oysters) attached to shells: in oyster gabions.

As of ~~APA 15, APA 28~~, the Living Breakwaters is currently at preliminary 60% design level, with 60% design expected has been subject to bea value engineering effort that took place after the 100% design was completed through the final permitting and environmental review stage. 100% design is anticipated to be completed by the end of 2018. an initial bidding exercise that resulted in bids that exceeded available funding.

The breakwaters system ~~at the preliminary 60% design stage~~ includes ~~98~~ breakwater segments, with approximately 3,300,500 linear feet of breakwaters in total. The breakwaters will be located between 730 and 1,200 feet offshore and in water depths of approximately 2 feet to 10 feet below mean low water (NAVD88). They will be set back a minimum distance of 500 feet from the Federal Navigation Channel with most project segments set back between 1,000 and 1,500 feet from the channel.

While the breakwater segments are similar in character and construction, ~~three~~ the project will include two breakwater types: ~~low-crested and high crested~~ defined largely by their differences in crest elevation and overall height, ~~are being employed in the preliminary 60% design~~ to meet the different bathymetric conditions, shoreline conditions, and priorities within each project zone. Each breakwater type differs in length and crest height (and thus, width). Side slopes are the same for all breakwater types. In addition to the main (traditional) breakwater segment, many of the breakwaters are ~~being~~ designed to include "reef ridges" and "reef streets". These rocky protrusions (reef ridges) and the narrow spaces between them (reef streets) on the ocean-facing side of the breakwaters, will create diverse habitats including interspaces of narrow rocky conditions within the intertidal (littoral) and subtidal (sublittoral) zones composed of textured surfaces and water retaining elements (in the intertidal zone). Low-crested breakwaters also include "ridge

crenulations”, small dips in the crest that provide intertidal (littoral) habitat that includes water retaining elements.

The breakwaters will be primarily constructed as rubble mound (rock) structures with a bedding layer, stone core and outer layers consisting of armor stone or bio-enhancing concrete armor units. In the subtidal and intertidal areas, up to one third of the armor stone will be include bio-enhancing concrete units rather than as well as stone, creating an “enhanced” habitat surface. The bio-enhancing concrete units will be integral components of the breakwater, functioning structurally as any stone armor unit would. But, unlike typical stone, the bio-enhancing concrete units are specially designed to promote biological recruitment, of biofouling organisms including oysters. The units use special concrete admixtures as well as textured surfaces to promote biogenic accretions and micro-habitat and biological community development. Some There are two types of units will receive: tide pool units placed in the intertidal zone that retain water between tidal cycles, and armor units placed in the subtidal area with complex surface texture that also allows for additional surface treatments beyond the basic surface texture to provide further enhancement; such treatments will include: as fish hubs; and shell containers; tidal planters; hatchery units; and tidal pool units.

Figure 6: Living Breakwaters at Preliminary 60% Final Design





*Active*

*Restoration*

Under the regulatory oversight of the ~~New York State Department of Environmental Conservation (NYSDEC)~~ DEC and the ~~US Army Corps of Engineers (USACE)~~, active bivalve, including oyster restoration activities, will be studied and developed as part of the post-construction ecological enhancements. These efforts will be led by the New York Harbor Foundation's Billion Oyster Project (BOP), which is actively researching, implementing other ongoing, monitoring, and managing various scales of oyster restoration efforts projects and studies within other New York City waterways. Subject to ongoing scientific study activities and permitting, active restoration on or adjacent to the breakwaters may include incorporation of spat placement into a small percentage of the bio-enhancing concrete units, the use of oyster shell gabions (filled with spat-on-shell (nonstructural units), spat on shell (placed in reef streets and potentially adjacent to the breakwaters), oyster nurseries) and in-situ setting pilot trials. The oyster gabions ~~would use the same~~ structure is a proven design ~~being employed in the~~ that BOP has been installed in other oyster restoration projects in ~~other harbor locations~~ New York Harbor as ~~part of a~~ result of several restoration efforts including the Hudson Raritan Estuary Comprehensive Restoration Plan. Spat-on-shell installations lead by BOP would ~~be based on~~ include techniques developed and deployed during the Oyster Restoration Research Project, ~~and oyster nurseries will be based on designs developed and currently in place or being installed by the BOP at Governors Island, Wallabout Bay and Jamaica Bay.~~ Additional oyster cultivation efforts ~~are being,~~ including oyster nursery installations at nearby Lemon Creek and Great Kills Harbor, have been implemented ~~for study prior to breakwater construction~~ in order to support the active restoration activities. These oyster nurseries were installed in 2017 with spat-on-shell, which are now



adult oysters. These adult oysters support the project's oyster restoration efforts by providing a potential source of oyster larvae for the Living Breakwaters years after they are installed.

### *Shoreline Restoration*

The project includes a targeted area of shoreline restoration along approximately 800 linear feet of shoreline between Manhattan Street and Loretto Street. This one-time shoreline restoration will restore it to its 1978 condition, at this narrow and erosion-prone location. The shoreline of the newly filled beach will change somewhat over time, but the breakwater system will hold the newly established shoreline, generating approximately a 50-foot increase in beach width from the current condition.

### *Social Resiliency*

Along with the living breakwaters, the project includes social resiliency ~~plans. The Water Hub, components, including school curriculums focused on the ecological benefits of oyster installations and associated field work opportunities for local students, as well as annual shoreline monitoring events, walking tours and a Living Breakwaters exhibit at Conference House Park, adjacent to the project site. These components will provide a gathering space and opportunities for lectures and community events thereby increasing community awareness of the benefits provided by the other elements of the project and enhancing the community's social resilience. The Water Hub will provide a venue for public exhibitions as well as on-site ecological educational space and facilities. The Water Hub~~ The exhibit at Conference House Park will provide a venue for the public to access on-site ecological educational information. Anticipated elements of the exhibit include models of the oyster installations on the breakwaters and/or a video display, in addition to signage explaining the purpose and benefits of the Living Breakwaters project. The annual shoreline monitoring event at the park will bring together local and citywide students and teachers to learn about the Living Breakwaters project and the ecological benefits of the oyster installation components by completing activities from the Living Breakwaters curriculum and engaging in scientific activities such as oyster monitoring on the shore adjacent to the breakwaters. The walking tours will engage schools, community groups and local residents and will focus on the breakwaters, their background and importance, as well as the history of the site and how the local community has interacted with the shore over the years. These social resiliency components at Conference House Park will provide the educational and programmatic support necessary to introduce the Living Breakwaters project to the surrounding community and visitors, provide resources and support to educators, and offer direct waterfront access and recreation opportunities to residents. In developing the concept for the Water Hub, the State and design team worked with the Living Breakwaters CAC and the public to identify opportunities for programming. This was the main driver for the size and location of the space. After undertaking a feasibility study of alternatives, including constructing a new building at Page Avenue and the renovation of existing historic structures in Conference House Park, both of which presented challenges to implementation, a third option is being considered for this aspect of the project. Rather than occupying a building on shore, the third option for the water hub would take the form of: 1) A mobile US Coast Guard certified passenger vessel which can directly access the breakwaters and is equipped to provide educational, monitoring and stewardship activities onboard (it would be owned and operated by the BOP); and 2) an on shore system of informational, interactive and wayfinding elements on the shoreline at key vantage points.

BOP and the New York Harbor School – operated by the New York Harbor Foundation<sup>v</sup>, a non-profit organization – are critical partners in the Living Breakwaters project to bolster Staten Island's social resiliency. In 2016, GOSR entered into a subrecipient agreement with the New York Harbor Foundation/BOP to provide funding for their work on the Living Breakwaters project. BOP plans to restore one billion live oysters to New York Harbor over the next 20 years while educating thousands of youth in the region about the ecology and the economy of their local marine environment. The Living Breakwaters project builds on this foundation by working with the schools, businesses, nonprofits, and individuals that engage with BOP, to provide new opportunities to study and develop plans for the cultivation of oysters

and grow existing and new educational programs. Through the expansion of this coastal stewardship and educational programming, the Living Breakwaters project design fosters a vibrant, water-based culture, and invests in students, shoreline ecologies, and economies. Promoting stakeholder participation in local communities will organically create local stewards, helping to ensure the long-term impact of the Living Breakwaters project's social resiliency components.

#### *Citizens Advisory Committee*

The Living Breakwaters CAC was officially formed in July 2015, and is comprised of local and regional stakeholders with diverse backgrounds. Up to 25 members may serve on the CAC. GOSR encourages applicants from all cultures and socioeconomic backgrounds in order to represent the diverse communities across Staten Island and the region. Representatives are selected by the State through on-line application submissions, or through paper submissions. The CAC has two-designated co-chairs. Serving in an advisory role, the CAC members not only represent residents of Tottenville and the adjacent communities in Staten Island, but educators, ecologists, and interested citizens from the larger New York City and New Jersey region. As of ~~October 2017~~ APA 28, the CAC has held ~~seven~~ nine public meetings and all presentations from CAC meetings are made available on GOSR's website (<https://stormrecovery.ny.gov/>).

#### *Benefit Cost Analysis*

A Benefit Cost Analysis (BCA) for the Living Breakwaters project was prepared in January 2017 following the HUD BCA Guidance provided in a HUD Guidance Notice (CPD-16-06). The analysis was completed using generally accepted economic and financial principles for BCA as articulated in OMB Circular A-94. For APA 28, an updated BCA was prepared to reflect the updated scope, benefits, costs, components and other details of the Living Breakwaters project included in this APA.

The project's cumulative present value of net benefits is ~~\$2.2~~ \$3.7 million and the Benefit Cost Ratio is ~~1.03~~ 2.2. These measures of project merit demonstrate that the project is viable and will add value to the community, the environment and the economy. Using a 7% discount rate, and a 50-year planning evaluation horizon, the project will generate significant net benefits to the shoreline community of Tottenville, Staten Island, New York, as well as other beneficiaries from the New York metropolitan region, and regional visitors who use this community asset.

According to the BCA, the lifecycle costs to build and operate the Living Breakwaters project (amounting to ~~\$82.7~~ \$62.4 million in constant 2016 present value dollars) will generate the following quantified benefits (not including qualitative benefits that cannot be quantified):

Total Benefits of ~~\$84.9~~ \$76.1 million, of which:

- Total Resiliency Values are ~~\$58.3~~ \$3.2 million
- Total Environmental Values are ~~\$140.6~~ million
- Total Social Values are ~~\$12.1~~ \$18.3 million, and
- Economic Revitalization Benefits are ~~\$2.9~~ \$3.9 million.

The project's future annual benefit and cost streams, projected over the 50-year horizon were also subjected to a sensitivity analysis - that evaluated risks associated with unanticipated occurrences such as construction and operation and maintenance (O&M) cost increases; in addition to unanticipated reductions in the largest benefit categories examining the impacts of the implementation phase and identified operational risks. The sensitivity analysis tested how changes in assumptions would alter the economic feasibility of the Project, measured by the BCR and the net present value. . examined potential cost overruns and increases as well as significant reductions in the largest benefit categories. The results ~~demonstrated~~ showed that the net present value of the project's benefits outweigh the costs and are robust, ~~as they~~ with a 3 percent discount rate and

can withstand these stress ~~events and factors, and it would~~ remain ~~positive~~economically viable over this period. The largest group of benefits consists of resiliency values related to wave attenuation provided by the project. The BCA demonstrates and quantifies the reduction of flood risk associated with this project.

The Living Breakwaters project BCA can be found at Appendix D to the New York State Action Plan at <https://stormrecovery.ny.gov/funding/action-plans-amendments>.

### *Project Feasibility and Effectiveness*

The Living Breakwaters project ~~has been and will be~~was continually engineered, modeled and tested during ~~the on-going phases~~each phase of design development utilizing risk management tools with the purpose of providing feasible and effective hazard mitigation and risk management, including provisions for climate change.

The State will utilize risk management tools to reflect changing conditions. Indeed, New York's Community Risk and Resiliency Act (CRRA) requires State agencies to consider future physical climate risks caused by storm surges, sea level rise, or flooding in certain permitting, funding, and regulatory decisions. CRRA required NYSDEC to adopt regulations by January 1, 2016 establishing science-based State sea level rise projections, and to update such regulations every five years. GOSR is coordinating with State partner agencies in implementing the provisions of the Act, including with regard to the Living Breakwaters project, to reduce risks to public safety caused by wave damage and to support resilient communities, now and into the future.

~~Specifically, with regard to the reduction/reversal of erosion, completed shoreline modeling of the breakwaters system estimated that over a 20-year timeframe – including potential sea level rise of up to 30 inches – the beach adjacent to the shoreline protection elements would grow while still maintaining the shoreline within other parts of the project area. The results are greatly improved with the inclusion of the planned shoreline restoration. With regard to wave attenuation, the breakwaters have been designed to – assuming 30 inches of sea level rise – reduce waves below 3 feet in height in the event of a 100-year storm. Thus, the project, as designed, will provide protection against current and future threats, including future risks associated with climate change.~~

Engineering and modeling ~~are~~were important risk management tools ~~being~~ utilized to review such matters as the design specification of materials, degree of scour protection, and the integration of ecological elements. Long term shoreline change models were used to evaluate shoreline change with and without the project in place. Specifically, with regard to the reduction/reversal of erosion, completed shoreline modeling of the breakwaters system estimated that over a 20-year timeframe – including potential sea level rise of up to 30 inches – the beach adjacent to the shoreline protection elements would grow while still maintaining the shoreline within other parts of the project area. The results are greatly improved with the inclusion of the planned shoreline restoration.

Numerical and physical hydrodynamic modeling is also being used to manage the risk of changing environmental conditions by testing design modifications and iterations to better understand the breakwaters' influence on sediment transport, potential scour, water circulation, and wave conditions. Wave attenuation benefits from the breakwaters were evaluated through extensive hydrodynamic wave modeling. With regard to wave attenuation, completed modeling of the breakwaters ~~have been designed to~~estimated that the breakwaters will - assuming ~~30~~up to 18 inches of sea level rise - reduce waves reaching on-shore buildings and roads to below 3 feet in height in the event of a 100-year storm. ~~Thus,~~The modeling also indicates that the breakwaters will continue to provide risk management reduction through wave attenuation at higher levels of sea level rise as compared to a no-breakwaters scenario. Hydrodynamic modeling tools

~~are helping~~ were also used to refine the reef street design, including parameters such as length, number, spacing, orientation, and location on the breakwater segment to optimize ecological performance.

Finalization of the ~~60%~~ design of the breakwaters ~~will occur after the current design plan has undergone~~ was informed by an extensive physical modeling exercise which ~~involves~~ involved the construction of a scale model of the system which ~~is~~ was placed in a tide pool as well as scale models of individual breakwater sections in a wave flume simulating the conditions in the project site. The physical modeling tested and proved out the design of breakwater components under a variety of environmental conditions, including extreme conditions such as sea level rise of up to 2.5 feet. Based on the project modeling, the project as designed will be capable of mitigating future wave risks associated with climate change and remain structurally sound well into the future. Based on the data collected and observations by specialized marine engineers, ~~this modeling exercise will validate that the current~~ through these exercises the design will achieve the hazard mitigation goals established for the project according to the standards set by the best available science and factoring in anticipated changes in environmental conditions over the coming decades. Thus, the project, as designed, will provide protection against current and future threats, including future risks associated with climate change.

~~After the 60% design GOSR has been finalized, it is anticipated that the USACE and the NYSDEC will render a determination on the permit application, which has been the subject interagency engaged in~~ extensive consultation and cooperation- with the USACE, the National Marine Fisheries Service, the Fish and Wildlife Service, the New York Department of State, and the DEC throughout the design phase. GOSR will continue to develop a regionally coordinated and resilient approach to infrastructure investment through continued coordination with organizations such as USACE and FEMA. GOSR has, since 2015, engaged in several conversations and consultations with the Regional Coordination Working Group to discuss the project and elicit feedback.

Construction of the breakwaters and the beach fill will be undertaken directly by GOSR. GOSR ~~will issue open and competitive procurements for~~ selected a construction management firm and a marine construction contractor ~~-with extensive marine construction experience through open and competitive procurements.~~ The procurements will require firms selected required extensive experience in marine construction in order to perform all the functions necessary to ~~certify that~~ construct the ~~plans and specifications are to~~ project in accordance with industry standards. The construction management team will monitor, inspect and approve payments to the contractor. ~~For added assurance of~~ During initial phases of the design, to assure compliance with industry, engineering and code standards, GOSR ~~will utilize~~ utilized a qualified and experienced peer reviewer to review technical aspects of design and construction documents prepared for this project. ~~The peer review firm is responsible for ensuring~~ Subsequently the construction management team assumed this responsibility. Together these two entities have confirmed that the design documents and procedures meet professional and engineering standards. ~~GOSR~~ Following completion of the project designs and consultation with the construction management engineering team, the project's licensed and registered professional engineer (the engineer of record) certifies that the design will meet meets the appropriate ~~code~~ codes, industry design and construction standards.

The November 18, 2013 Federal Register Notice (78 FR 69104) requires grantees “to identify and implement resilience performance standards that can be applied to each infrastructure project.” In the “Resilience Performance Standards” of its Action Plan, the State identifies a set of performance standards that it uses to measure resiliency which include:

- Robustness
- Redundancy
- Resourcefulness
- Response

- Recovery.

In determining its resilience performance standards, the State of New York has relied on national and global sources such as the Federal Hurricane Sandy Rebuilding Strategy,<sup>vi</sup> the US Department of Commerce Community Resilience Planning Guide for Buildings and Infrastructure Systems,<sup>vii</sup> World Economic Forum Global Risk Report,<sup>viii</sup> the United Nations,<sup>ix</sup> and Rockefeller Foundation City Resilience Framework,<sup>x</sup> as well as New York State sources including as the 2100 Commission Report,<sup>xi</sup> Sea Level Rise Task Force Report,<sup>xii</sup> and NYS Hazard Mitigation Plan. The State also sought scientific input from the New York State Resiliency Institute for Storms and Emergencies (RISE).<sup>xiii</sup> State action on resilience performance standards is also informed by the Community Risk and Resiliency Act (CRRA), signed into law on September 22, 2014.

Together, these strategies, regulatory actions, and innovative program initiatives have helped inform the State approach to setting resilience performance standards. The various studies stress several qualities of resilient systems identified above and in the “Resilience Performance Standards” section of the Action Plan – robustness, redundancy, resourcefulness, response and recovery. One or more of these resilience qualities are considered for each infrastructure project, including the RBD projects.

GOSR has developed a Resiliency Monitoring Schedule (set out in Table 37, below) which will ensure that the completed project will achieve the resiliency benefits and mitigation features that the design anticipates, including beach growth/stabilization, wave attenuation, water quality and biological enhancement. This approach to resiliency monitoring, which is detailed in the section on Maintenance and Operations in this Action Plan, ~~will be further developed and was~~ refined ~~during the upcoming design phases and the~~ as a part of the permitting of process for the structures by NYSDEC and USACE.

GOSR will ensure that all appropriate mitigation measures are put in place and meet applicable federal and State standards. The Resiliency Monitoring Schedule will also include the evaluation methodology, which ~~GOSR~~ the State will implement after the project is complete. The purpose of the evaluation methodology is to determine the Living Breakwaters project’s efficacy level in addressing the community’s needs through a robust inspection and data collection program. Inspection data will be captured in a report that ~~documents findings that establish~~ establishes a baseline, ~~monitor progress~~ and ~~establish~~ benchmarks to gauge the effectiveness of the project against anticipated outcomes, ~~and subsequent reports that document the results of monitoring of the structures and their performance.~~ As detailed below, inspections will assess effectiveness of components, and identify any major unexpected conditions (i.e., deviations from expectations). Lessons learned will be documented as required by HUD.

#### *Maintenance and Operations*

NYSDEC will own and operate the breakwaters and will be fully responsible for their maintenance and for monitoring their performance. The State of New York ~~is~~ through a Memorandum of Agreement with NYSDEC has committed to the long-term maintenance and operation of this important resiliency measure. NYSDEC is the state agency whose mission is to conserve, improve and protect the State’s natural resources and the environment. NYSDEC includes a Division of Marine Resources with specific responsibility for managing and enhancing marine resources and their habitats, and is therefore uniquely qualified to undertake the responsibilities of the long-term maintenance of the breakwaters.

Basic maintenance and operations of breakwater structures is anticipated to be minimal, with visual inspection of structures required no more than ~~annually~~ biannually. Maintenance will likely only be necessary following storm events. The breakwaters have a 50-year design life and are designed to function in a 100-year storm. A basic post-storm event inspection may reveal maintenance work such as stone adjustments or replacement, but such maintenance is expected to be, at most, minimal. See below for anticipated operations and maintenance schedule.

Table 37: ~~Anticipated~~ Approved Operations and Maintenance Schedule

Basic Operations and Maintenance Tasks	Suggested frequency of Inspections
Baseline Inspection <del>and</del> /as-built survey	Once, immediately after construction
Above water visual inspections	<del>Annually for first</del> <u>Every 2.5 years, every 2 to 3 beginning two</u> years after <del>that</del> <u>baseline inspection.</u>
<del>Surveys at settlement monuments</del> <u>Underwater inspections</u>	<del>Monthly for first 6 months, then routine</del> <u>Every 5 years beginning two years after baseline inspections (annually)</u>
Post <del>storm</del> event visual inspection and (if needed) survey	<del>Following</del> <u>Within one week of potentially damage causing event (such as vessel impact, earthquake, or</u> storm event roughly equivalent of 10-year return period or greater)

~~Based on a review of similar structures, operations and maintenance costs for rubble mound breakwaters are typically between 1% and 5% of the construction cost, over the lifetime of the project. Based on a conservative estimate of the construction cost of these breakwaters, their operations and maintenance costs over the 50-year life of the asset would be between \$500,000 and \$2.5 million.~~

Based on a detailed review required by NYSDEC; operations, monitoring and maintenance costs for the first 15 years will be approximately \$6.24 million. NYSDEC, per the Operation and Maintenance manual, may elect to reassess the inspection frequency and associated costs after 15 years of routine monitoring, based on the inspection findings to date and industry-accepted practice at that time. Given the possibility of changes to the Operations and Maintenance schedule and methodology after the first 15 years, the permitting agencies concurred that it is impracticable to estimate these expected costs for the rest of the project’s useful life. However, as established in the Memorandum of Agreement, NYSDEC will assume the responsibility for the breakwaters’ operation and maintenance, and any associated costs, for the entirety of the project’s useful life.

Monitoring for the project’s resiliency performance will ~~require on-going attention over~~ be required for at least ~~5~~ 15 years after the completion of construction. NYSDEC will be responsible for the necessary monitoring tasks. ~~The exact term and cost of these monitoring tasks has not yet been determined, but will be determined before construction is complete.~~ Below is a Resiliency Monitoring Schedule outlining the ~~anticipated~~ planned monitoring tasks and ~~likely~~ frequency, ~~as of APA 28.~~

Table 38: Resiliency Monitoring Schedule

Monitoring Tasks	Suggested frequency & duration of Monitoring
Shoreline change and bathymetry: beach profile surveys + sediment samples	<del>Twice annually, in the spring /fall, min 3 years after following completion of the winter storm season post-construction, ideally in years 1, 2, and 5+, and in years 10 and 15</del>
Wave climate monitoring: wave height and direction	<del>Minimum</del> <u>Continuous monitoring for a minimum of 6 months after construction for at least 5 years</u>

Post <del>storm</del> -event visual inspection and transect surveys	Following a storm intensity equivalent to <u>exceedance of a 10-year return period, defined as a storm event of greater where the measured water level at the NOAA Sandy Hook tide station (#8531680) exceeds 6.7 feet NAVD88 (9.5 feet MLLW).</u>
Monitoring of biological and ecological performance of flora and fauna: sessile communities	<del>Quarterly for 1st year, semi-annually for 2nd year, annually for 5 years</del> <u>Once in the summer starting in the second year following construction, and then annually in the summer during year 3, year 4, year 5, year 10, and year 15</u>
Monitoring of biological and ecological performance of flora and fauna: fish and other motile species	<del>Quarterly for 1st year, semi-annually for 2nd year, annually for 5 years</del> <u>During the spring, summer, and fall in monitoring years 1, 3, and 5, and again in years 10 and 15.</u>
Water Quality Sampling, in situ and lab samples	<del>Quarterly for 1st year, semi-annually for 2nd year, annually for 5 years, per permitting requirements</del> <u>During spring and fall in monitoring years 1 through 5, year 10, and year 15</u>
Sediment Characteristics & Chemistry: turbidity, total suspended solids, etc.	<del>Quarterly for 1st year, semi-annually for 2nd year, annually for 5 years or per permitting requirements</del> <u>During summer and fall in monitoring years 1 through 5, year 10, and year 15</u>

**Budget**

The budget amount submitted in the overall design proposal to the RBD competition for the Living Breakwaters project was \$73,904,000. Based on the Living Breakwaters ~~preliminary 60% current~~ design and engineering estimate, the ~~budget estimated overall cost~~ for the Living Breakwaters is approximately \$70107,000,000. With a CDBG-DR allocation of \$60,000,000, the State ~~will continue to explore additional funding options~~ has agreed to fill any the unmet needs and analyze the budget further to implement a ~~reduced scale project which still meets the project objectives. The environmental review and permitting process currently underway may help shape the potential implementation requirements of the project through the 60% design phase that were not identified at the 30% design level~~ need of \$47,000,000. The estimated project budget in the table below differs from project investment costs included in the BCA primarily due to the inclusion of costs for environmental mitigation required by the project’s permits, and additional construction contingency funds included in the Project’s budget.

Table 39: Living Breakwaters Budget\*

Break-down	Budget Cost
Planning	<del>\$8,000,000</del> <u>14,911,424</u>
Pre-Development	<del>\$3,000,000</del> <u>6,143,480</u>
Capital Construction Costs*	<del>\$58,000,000</del> <u>75,997,131</u>
Program Delivery	<del>\$1,000,000</del> <u>9,947,965</u>
<b>Total Project Cost</b>	<del>\$70,000,000</del> <b><u>\$70,107,000,000</u></b>

\* At preliminary 60% design, includes construction of the Living Breakwaters project, which includes the breakwaters, environmental enhancements, shoreline restoration, and Water Hub

## Timeline

In the ~~3<sup>rd</sup>~~<sup>1<sup>st</sup></sup> Quarter of ~~2016~~<sup>2019</sup>, the Living Breakwaters project ~~achieved the milestone of 30% design. As of late 2017, the State is progressing through the planning and design phase of the project and continuing with design of the breakwaters through finalization of 60% design, to be followed by 95% and completed 100% design, and development of the construction bid documents which are expected. Procurement efforts began immediately, but the bids received in the 3<sup>rd</sup> Quarter of 2019 exceeded the engineering estimate by over \$20 million, resulting in a funding gap. After an extensive value engineering effort, the project was rebid in the 2<sup>nd</sup> Quarter of 2020, the construction contract was executed in the 4<sup>th</sup> Quarter of 2018. Managed concurrently with these design efforts, the State has completed and published a Draft EIS 2020 and in-water construction is expected to begin in the 3<sup>rd</sup> Quarter of 2021 and be completed no later than 2024. The CDBG-DR allocation for Living Breakwaters will be fully expended ahead of the September 2023 expenditure deadline, after which point the project and permits have been filed with the appropriate regulatory agencies for the project. will be completed with the additional State funding.~~

## Environmental Review and Permitting Schedule

The State ~~has published~~<sup>issued</sup> the *Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, NY* ~~Draft~~<sup>Final</sup> EIS (FEIS) for the Living Breakwaters and ~~the Tottenville Shoreline Protection Project (TSPP), a related project on the shoreline in front of the breakwaters being pursued by New York City TSPP projects.~~ The ~~Draft EIS~~<sup>FEIS</sup> analyzed the environmental impacts of four project alternatives: 1) No action; 2) Construction of the Living Breakwaters project; 3) Construction of the TSPP; or 4) construction of the Living Breakwaters project and TSPP (Preferred alternative). ~~The State received agency and public comments during the review period ending May 8, 2017. The Joint Record of Decision and Finding Statement of the FEIS was issued on August 31, 2018.~~

The State has ~~filed for~~<sup>received the</sup> necessary permits ~~from NYSDEC and USACE to construct the Living Breakwaters project. This includes the filing of a Joint Permit Application with USACE and NYSDEC.~~ Large scale oyster restoration activities, which have independent utility from the resiliency and ecological benefits provided by the breakwater structure, ~~are currently undergoing scientific and agency review, and may will~~ be subject to additional review and permitting requirements prior to implementation in the post-construction phase. ~~Since The permitting process for oyster installation began in Q1 2021, with the Draft EIS was published and permits expected Q3 2022. Throughout the permit applications filed phase, the State has engaged in a rigorous dialogue with all the relevant local, state and federal agencies which commented on the Draft EIS or have permitting authority.~~ As part of the EIS process, GOSR ~~has~~ met and consulted frequently with key government agencies including the USACE, NYSDEC, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Services. GOSR also presented the plans to the Sandy Regional Infrastructure Resiliency Coordination Federal Review and Permitting Team. This dialogue ~~has~~ prompted refinements of the original submissions ~~and will to~~ ensure that all necessary permits are secured and that the final design and construction of the project will adhere to all relevant codes. ~~It is anticipated that the Final EIS and Record of Decision will be published in the 4<sup>th</sup> Quarter of 2017 or 1<sup>st</sup> Quarter of 2018, and that the regulatory agencies will render their permit determination in 2018.~~

## Breakwater Schedule

~~Concurrent to finalizing the EIS and permitting for the Living Breakwaters project, the next phase of work will include advancing the breakwaters through final design and preparation of construction documents. There are many steps that will be taken during the next phase of design to refine, modify, and test the current design scenario, and solidify the approach for final design.~~



~~Finalizing the 60% design, then 95% and then bid documents (100%) will be the focus of the next design phase. Developing the preliminary 60%~~

~~The 100% design of the Living Breakwaters was originally completed in January of 2019. Developing this design involved refinement of the breakwater system and segment design to optimize their performance relative to the project objectives, taking into account feedback on the 30% received at each design milestone (30%, 60% 95% completion) from regulatory agencies, peer reviewers, construction managers and the Living Breakwaters CAC and other stakeholders, etc. This included refinement of breakwater design parameters like crest elevation, orientation and shape. The next phases of design refinement will also include close coordination with the TSPP design team.~~

~~Completion of 60% design of the breakwaters is expected in the 1<sup>st</sup> Quarter of 2018; Completion of 95% design is expected in the 2<sup>nd</sup> Quarter of 2018; and completion of 100% design is expected in the 3<sup>rd</sup> Quarter of 2018. Procurement for breakwaters construction is anticipated to take place in the 4<sup>th</sup> Quarter of 2018 with construction to follow. Construction is expected to take up to 24 months to complete, depending on permitting restrictions.~~

#### *Water Hub Schedule*

~~The State has completed a Water Hub feasibility study regarding how best to achieve the social resiliency components of the project, and is now seriously considering a preferred alternative that will consist of a vessel equipped with educational and exhibition space. The vessel will be able to travel to and dock near the Breakwaters, thereby eliminating the need for construction of a building and a floating dock. There will also be an onshore interpretive design system likely including signage and other educational features. The Water Hub will be designed specifically to accomplish the RBD project's social resiliency goals and will be purchased by the BOP in time for the Breakwater construction completion by early 2021. The onshore Water Hub features will be designed in cooperation with the TSPP project and constructed as a part of that effort also by 2021. If either of the original land-based alternatives were pursued, their construction would be undertaken during the term of the breakwater construction, beginning in early 2019 and finishing by early 2021.~~

~~Based on the 100% design and the associated contract documents, the State undertook a procurement to identify a qualified marine contractor. However, the bids received from that process exceeded the engineering estimate by over \$20 million, resulting in a funding gap. An extensive value engineering effort began in late 2019, with the goal of modifying the scope and construction methods of the project without sacrificing the core resiliency objectives or the purpose and need of the project. A second Invitation for Bids (IFB) based on the value engineered designs was issued in the 2nd Quarter of 2020. The IFB resulted in a construction contract for the breakwaters executed in the 4<sup>th</sup> Quarter of 2020 with in-water construction expected to begin in the 3<sup>rd</sup> Quarter of 2021 and be completed as early as Q3 2023 but no later than Q4 2024. Construction is expected to take 24 - 42 months to complete.~~

#### *Oyster Restoration and Social Resiliency Schedule*

The New York Harbor Foundation/BOP entered into a subrecipient agreement with GOSR in the 4<sup>th</sup> Quarter of 2016 to ~~continue~~continue work on scientific studies necessary to implement oyster cultivation, as well as to refine the design of oyster installations for the breakwaters and provide input on the Water Hub social resiliency program and design. The agreement and scope of work ~~runs~~for the oyster installation component will be extended to run through the ~~2<sup>nd</sup> Quarter~~4th Quarter of ~~2018 to coincide with final design~~2024 to extend to the period of the Living Breakwaters ~~project~~construction. BOP will continue scientific evaluation and development of the suitability of an active bivalve restoration plan under regulatory authority and technical review of NYSDEC.

This includes continued work on installation and operation of oyster nurseries at Great Kills and Lemon Creek, development of a workforce training program, and the BOP Shell Collection and Recycling program. Scientific and other information from these pilot studies will ultimately be used to develop a plan for larger scale oyster restoration, which will be subject to the review and approval of NYSDEC. All activities will run through ~~final project design~~ the construction phase.

Oyster restoration activities are expected to ~~take place after the breakwaters are constructed~~ be completed as early as Q3 2023 but no later than Q4 2024. It is likely that these restoration activities would begin as smaller scale pilot studies, and that larger scale oyster restoration would be developed as BOP completes its evaluation of ongoing pilot projects. Table 40 provides the anticipated project schedule by quarter.

The Living Breakwaters exhibit at Conference House Park will be enhanced beginning in Q1 2022, with updates and enhancements planned on an annual basis. The shoreline monitoring events and walking tours at the park are expected to begin in Q2 and Q3 2022, respectively, and will take place at least annually. These social resiliency activities are expected to continue through at least 2029.

Table 40: Living Breakwaters Proposed Schedule

	Start	Finish
<b>Living Breakwaters</b>	<b>Quarter 4 2014</b>	<b>Quarter 4 <del>2024</del>2024</b>
Study, Research Planning: This Phase will outline all additional studies, research and planning needed prior to the design and engineering phase. As necessary, this phase will be incorporated into the Environmental and Review and Permitting stage as well as the Engineering Phase.	Quarter 4 2014	Quarter 2 2016
Environmental Review and Permitting: This Phase will include scoping for and preparation of an environmental impact statement, as well as the submittal of permits applications to the appropriate governmental agencies. This Phase will include significant opportunities for public review and comment, as well as intergovernmental consultation. Additionally, as required by State and federal law, the EIS will evaluate alternatives to the proposed project. This timeline is meant to represent an overview of the expected Environmental Review Process for all aspects of the Living Breakwaters. It should be noted that the environmental review and permitting timeline is dependent on the permitting requirements of agencies with jurisdiction, including the United States Army Corps of Engineers, NOAA-NMFS, USFWS, and the New York State Department of Environmental Conservation.	Quarter 4 2014	<del>Quarter 1 2018</del> <u>Quarter 3 2022</u>
Design and Engineering: This phase will include all design and engineering work required for Living Breakwaters culminating with complete construction specs. Depending on the progress and outcome of the Environmental Review and Permitting process, this process will be able to run concurrently for some components of the project. This phase will include any and all necessary procurement and contracting as appropriate.	Quarter 4 2015	<del>Quarter 4 2018</del> <u>2020</u>
Site Development: This Phase will include all necessary elements for site development from the Design and Engineering Phase that will prepare for the construction phase of Living Breakwaters. GOSR will evaluate a potential phased site development schedule for different project components (e.g., upland components and in-water components) <del>and coordination with the TSPP.</del>	<del>Quarter 3 2016</del> <u>2020</u>	<del>Quarter 4 2018</del> <u>2021</u>
Construction: This Phase will include all elements of construction related to Living Breakwaters outlined in the Design and Engineering Phase. For Living Breakwaters, the timeline is extended to reflect that the nature of the project will only allow for construction in specific building seasons. GOSR will evaluate a potential phase construction schedule for different project components (e.g., upland components and in-water components).	<del>Quarter 4 2019</del> <u>2021</u>	<del>Quarter 4 2021</del> <u>2024</u>
Closeout: This phase will include the closeout of the entire project, including but not limited to: Final site visits and review, release of final contingency payments and all applicable CBDG-DR construction closeout requirements.	<del>Quarter 4 2020</del> <u>2023</u>	<del>Quarter 4 2024</del> <u>2024</u>

From page 157 of the New York State Action Plan:

### *Overall Rebuild by Design Requirements*

#### **Implementation Partnerships**

GOSR currently plans to serve as the grantee agency responsible for the implementation of both RBD projects. GOSR is responsible for the implementation of the entire CDBG-DR portfolio for New York State and has taken the necessary steps to build capacity since its inception in June 2013. Two program areas within GOSR have specific skills to address the RBD projects. The New York Rising Community Reconstruction (NYRCR) Program, an award winning community-based resiliency planning and implementation effort comprised of citizen planning committees throughout the Sandy-impacted region has worked in close collaboration with both winning RBD teams in the State of New York throughout project concept development. In addition to engaging with citizen groups, NYRCR Program has working relationships with local and county governments that will be vital to the success of these RBD projects.

The second program is the GOSR Infrastructure Program. GOSR is currently undertaking numerous, large scale infrastructure projects and has demonstrated the capacity to manage these projects in a timely, cost effective manner. Engaging with federal, State, local, and private entities in other CDBG-DR projects, GOSR has demonstrated an ability to work collaboratively with other entities as needed to execute successful resilient recovery projects. It is prepared to leverage institutional knowledge and spearhead RBD project implementation. Both Programs are committed to developing innovative financing strategies that streamline recovery at the local level while maximizing available CDBG-DR funds. The LWTB project implementation team is integrated by GOSR Housing Program, Legal, Environmental, and Policy staff and includes experienced engineers, project managers, lawyers and policy analysts who work closely both internally and with project consultants and implementation partners to advance the LWTB project. [The Living Breakwaters team is integrated by GOSR Legal, Environmental, and Policy staff working in close collaboration with design and engineering consultants, the construction management and contractor teams.](#)

The State maintains up to date certifications of proficient controls, processes, and procedures to ensure that the grantee has established adequate and proficient financial controls; procurement processes; procedures to prevent any duplication of benefits as defined by Section 312 of the Stafford Act; procedures to ensure timely expenditure of funds; procedures to maintain comprehensive websites regarding all disaster recovery activities assisted with these funds; and procedures to detect fraud, waste, and abuse of funds.

Further, each RBD project is subject to complex federal and State environmental review and permitting requirements, which will include the assessment of alternatives. For both projects, GOSR intends to serve as the lead agency for the environmental reviews and, as the projects are shaped through this process, will consult closely with interested governmental and non-governmental stakeholders. The State understands that the partnership and coordination of partners throughout the life of each RBD project is crucial for its success. Throughout the planning and environmental process the State has engaged with numerous entities in the public and private sector.

Additionally, GOSR has an established environmental review bureau, and has procured two experienced environmental review firms to undertake environmental review consistent with the NEPA process and permitting process. GOSR has engaged in rigorous efforts to coordinate with federal, state, and local agencies concerning both projects.

As the State moves towards the implementation phases of the RBD projects, the State will continue to assess the needs of each project and how private sector partners can be engaged to fill any project gaps. The State intends to explore options with local advocacy groups, educational institutions, for profit agencies and not for profit agencies as appropriate for each RBD project.

The nature of the projects also indicate that the State anticipates possible engagement with federal agencies such as HUD, the Army Corps of Engineers, the U.S. Department of the Interior, the U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, U.S. National Park Service, and other partners as needed for the design and execution of each project. Within the State, there are numerous agencies that will also play specific roles in the implementation of these projects, such as New York State Department of Environmental Conservation, Department of State, Department of Education, State Historic Preservation Office, State Parks and others to be identified as the State works through the planning and environmental phase. The State intends to facilitate its coordination and consultation efforts through the Sandy Regional Infrastructure Coordination Group (SRIRC) convened by HUD and FEMA. Each RBD project will also require careful consultation with local governments and necessitate long-term agreements between the State and other relevant entities before construction starts to ensure proper operation and maintenance of the projects.

### Living Breakwaters

For Living Breakwaters, GOSR has engaged in multiple meetings and consultations with the SRIRC, HUD, USACE, EPA, NOAA/NMFS, ~~DEC/NYSDEC~~, DOS, State Park's State Historic Preservation Office, and the New York City Department of Parks and Recreation (NYCDPR) throughout the ~~30%~~-design ~~phase process~~. GOSR ~~has~~ circulated a lead agency letter, and USACE, EPA, and NOAA/NMFS, among others, ~~have~~ agreed to serve as cooperating agencies.

For Living Breakwaters, the State performed outreach to the City of New York and relevant agencies, including the Mayor's Office of ~~Recovery and~~ Resiliency, NYCDPR, the Department of Environmental Protection, the Department of City Planning, as well as the Office of the Borough President. In 2016, GOSR entered into sub-recipient agreements with the New York Harbor Foundation and New York/New Jersey Baykeeper. Both non-profit organizations ~~are being were~~ provided funding to assist in Living Breakwaters project design, social resiliency planning, and ecological restoration.

Additionally, GOSR has already been engaged with NYCDPR as a potential partner on certain elements of the Living Breakwaters project, and view them as a critical involved agency for purposes of the overall EIS. In July 2015, GOSR entered into a memorandum of understanding<sup>xiv</sup> with NYCDPR outlining processes and procedures for coordinating between the City and State as design of the Living Breakwaters project progresses. GOSR is reviewing the project using the strictest environmental standards, as demonstrated by the fact that GOSR ~~intends to utilize~~ utilized the City's Environmental Quality Review Technical Manual – the blueprint for conducting environmental review in New York City – in its analytical chapters, while according with the State Environmental Quality Review Act and the NEPA, even though State agencies are not typically required to use the City's Manual. GOSR also engaged with New York City agencies during development of its preliminary draft scope, and received detailed comments from NYCDPR, Department of Environmental Protection, NYC Landmarks, Department of City Planning, and the Mayor's Office of Sustainability.

### Living with the Bay

With respect to LWTB, GOSR has engaged in consultations with the SRIRC, USACE, NOAA/MFS, DEC, State Parks, U.S. Fish and Wildlife Service (USFWS), as well as Nassau County, the Town of Hempstead, Village of Malverne, Village of East Rockaway, Village of Rockville Centre, the East Rockaway School District, and Village of Lynbrook (local governments) during its planning phase. GOSR provided a presentation on its LWTB planning efforts to the SRIRC Long Island Technical Coordination Team in May 2015. GOSR has held regular progress meetings with these stakeholders as well as HUD, the Technical Advisory Committee (TAC) and the Citizens' Advisory Committee (CAC). Among other activities, local governments will be involved in the environmental review process, evaluation of implementing partners, and establishment of long-term agreements between the State and relevant entities to ensure proper operation and maintenance of projects prior to construction. As of Q1 2020, GOSR has entered into agreements with State Parks, Seatuck, Hofstra University and Rockville Centre as described below. As all

focus areas proceed through design, GOSR will develop a comprehensive implementation plan to identify partners with the appropriate capacity, experience and ability to work collaboratively to implement all interventions.

In November 2014, GOSR entered into a Memorandum of Understanding (MOU) with State Parks to perform improvements (unrelated to LWTB) to Robert Moses and Roberto Clemente State Parks. Amendment 1 to the MOU approved additional funds for studies to develop the LWTB project, including:

- Surveying lakes and ponds,
- Assessing groundwater depths and flows,
- Sampling and testing sediments for disposal,
- Investigating subsurface soils at the dam,
- Developing a stream gauge with telemetry based reporting of stream levels and flows, and
- Performing topographic surveys.

Amendment 2 to the MOU authorized State Parks to replace and repair all the equipment in the existing dams and equipment at the existing gatehouse, improve the NW Pond, improve the NE Pond, design and build a new Environmental Education and Resiliency Center, design and build an ADA accessible greenway, and design and build waterfront improvements. As of May 2020, State Parks has performed environmental and engineering studies to develop a scope and has completed final (100%) design of the first stages of improvements; received Authority to Use Grant Funds for the project, and begun construction work on the first stage of the project. State Parks has a demonstrated history of working with GOSR, to collaborate with other agencies and units of government, resulting in a beneficial experience that will assist in the successful implementation of key components of the LWTB project, such as the proposed improvements to Hempstead Lake State Park.

Seatuck has entered into a sub-recipient agreement with GOSR to: 1) consult on migratory fish and other ecological restoration, 2) conduct biological surveys of fish and bird populations, and 3) conduct environmental education related to the river's natural history. Seatuck staff participated in numerous strategy meetings and site visits throughout 2015 and 2016. These meetings, which involved NYSDEC, State Parks, USFWS and a host of various consultants, focused on opportunities for reconnecting the river to the bay, improving habitat and advancing migratory fish restoration. The LWTB project will benefit from the expertise of this partner, aiding the implementation of project components, particularly with regard to the project's social resiliency objectives.

GOSR entered into a sub-recipient agreement with Hofstra University on June 26, 2018, to implement various education and social resiliency programs described above in the social resiliency focus area for LWTB.

GOSR entered into a sub-recipient agreement with the Village of Rockville Centre on November 1, 2015 in anticipation of the Village leading implementation of Smith Pond and Lister Park. GOSR will coordinate its efforts with this valuable local partner as the project develops.

As of APA 26, the proposed subrecipients for the remaining focus areas are as follows: East Rockaway High School Hardening- East Rockaway School District; East and West Boulevards and the Greenway-Town of Hempstead; and Long Beach WPCP Consolidation- Nassau County.

### **Leveraging of Funds**

The State is committed to the successful implementation of both RBD projects using the allocations provided and understands the need to identify and secure additional funding outside of the CDBG-DR

allocation as needed. This includes not only identifying funds to address the unmet needs identified in the awarded phases of the project, but identifying innovative funding mechanisms to pay for the long-term operation and maintenance costs of these projects. The State will look at funding opportunities such as federal, State or private grants, and collaboration with not for profit and academic institutions focused on similar resiliency actions, as well as financing opportunities, which can be leveraged alongside CDBG-DR for investment.

Table 43: Leveraging of Funds – RBD Unmet Need

Project	Location	Total Project Cost	CDBG-DR Allocation	RBD Unmet Need
Living Breakwaters	Richmond County	<del>70</del> \$107,000,000*	\$60,000,000	<del>\$10,000,000</del> \$0
Living with the Bay	Nassau County	\$189,226,000**	\$125,000,000	\$21,526,000

\*At ~~preliminary~~ 60%final design; \*\* The design for each component of LWTB ranges from preliminary designs through 100% (final) designs

The process to identify funding and financing opportunities for Living Breakwaters and LWTB started with a high-level review of both projects as a whole and the respective component phases. By taking this approach, the State can elucidate a variety of layered funding and financing opportunities. Many of the grant opportunities identified are both competitive and ongoing, based upon State and federal budget appropriations.

An important initial step will involve finalizing the entities implementing each component of each RBD project and evaluating if they can provide financial support and oversight, long term operations, and maintenance capacity for the project. There are some unique financing opportunities such as public-private partnerships, but this may entail a repayment to the private partner for their work. All options should be further based upon the ability and willingness of the entity implementing the project to entertain these options.

The State will utilize the following iterative approach as the process for assessing the need for and securing additional funding for each RBD project:

1. Prioritize Living Breakwaters and LWTB project components. Isolate components of both projects and identify the following items:
  - a. Initial budget, including start-up and capital costs, ongoing operations, and maintenance;
  - b. Identify entities/partners to implement, operate, and maintain the project post-completion; and,
  - c. Develop time horizon for initial capital costs and ongoing operations and maintenance.
  - d. Assess potential funding gaps or opportunities for scope enhancement
2. Organize sources of funding and financing based upon the initial assessment:
  - a. Identify sources of funding from entities/partners implementing and operating the projects and agencies or organizations with aligned principles and/or missions to that of the RBD projects or project components;
  - b. Prioritize funding opportunities based upon grant funding application dates and probability of success;

- i. Develop a layering strategy for each project component as needed;
  - c. Identify if financing structures would be applicable to any components of both projects;
    - i. Identify ability and willingness of local municipal partners to issue debt or take on long-term liabilities involving project finance;
  - d. Engage not for profit, academic, corporate, and philanthropic partners with draft program framework for funding.
3. Continually update and monitor federal, State, and local grant opportunities.

The approach outlined above is achieving success for the Living Breakwaters project. ~~The New York City Regional Economic Development Council awarded the New York Harbor Foundation a \$250,000 grant BOP is seeking to bring oysters and their reef habitat back additional funding to the New York Harbor. This is anticipated to further the development provide continued support for the social resiliency components of oyster restoration activities related to~~ the Living Breakwaters project. Partnering with non-profit organizations and academic institutions will be key in identifying and applying for additional funds for each RBD project.

GOSR and implementing partners are and will continue to identify opportunities for funding to expand investment within the LWTB project area, identify complementary projects and/or fill potential future funding gaps.

In order to help leverage funds to enhance and expand LWTB, State Parks is considering pursuing a project (with funding through the Environmental Protection Fund) to develop an Invasive Species Management Plan to enhance the long-term sustainability of projects funded through CDBG-DR. Also, Parks is planning infrastructure upgrades and public facility enhancements at Hempstead Lake State Park with New York Works infrastructure funding. Projects would include upgrading the Park's primary electrical feed to one that is more energy efficient, constructing a new water main, formalizing a soccer field, upgrading tennis courts and basketball courts, receiving \$500,000 to establish a program for at risk youth (Explorers Program) with the Nassau County Police Department and rehabilitating comfort stations to support increased visitation in the future.

GOSR has had initial discussions with US EPA, NOAA and USACE regarding possible grants. GOSR will continue to monitor the availability of leverage funding from these sources to augment LWTB project components.

As part of the resiliency improvements at East Rockaway High School, the School District intends to secure non-GOSR funding to elevate the playing fields ~~to~~ eliminate frequent flooding that is currently experienced. Consideration will be given to installing an artificial turf to improve drainage. Potential grants will be pursued via the US Soccer Foundation and National Football League Foundation for the artificial turf, which would allow better drainage (to avoid flooding), greater field utilization and lower maintenance costs.

The Long Beach Wastewater Consolidation Project involves a series of projects with independent utility with an estimated total cost of \$93,878,880. The LWTB funded focus area project is estimated to cost \$88.23 million dollars for the pump station replacement and connection to wastewater treatment facilities. LWTB will provide \$24 million in CDBG-DR funding to the \$88.23 million dollar project in addition to \$42.7 million in funds secured by the proposed subrecipient through other NYS grants. The proposed subrecipient intends to address the remaining unmet need through an application for additional State grants and a FEMA PA 406 Mitigation grant. The proposed subrecipient has made commitments to bridge any shortfall if grants are not secured.

GOSR certifies that, for each RBD project, the preliminary design considers the appropriate code, or industrial design standard and construction standards, and that the final design will adhere to all relevant

codes and statutes when it is complete. GOSR will have a registered professional engineer, or other design professionals, certify that the final design met the appropriate codes prior to the obligation of funds by the grantee for construction.

### **Citizen Participation Plan for Rebuild by Design**

Public participation was instrumental in the development of each RBD project, as evidenced by the high level of community engagement undertaken by both design teams. This Citizen Participation Plan (CPP) advances policies and procedures that will engage a large and diverse group of stakeholders. Possible outreach strategies are described in the environmental review section as well as below. A primary outreach strategy used to implement RBD projects was the formation of a CAC for each RBD project. When feasible, further opportunities for public input will be aligned with public participation in the environmental review process to ensure that the public has the ability to learn about the projects and also submit comments and concerns that will inform the assessment of potential environmental impacts and project alternatives.

The CPP reflects guidance specified by HUD in the Federal Register (FR-5696-N-11).

The State will ensure that any Units of General Local Government or sub-recipients receiving funds for RBD projects will have a CPP that meets the HUD CDBG-DR regulations and takes into consideration the waivers and alternatives made available under CDBG-DR funding.

### **Public Outreach for Rebuild by Design**

To keep the public informed throughout the RBD project scoping, environmental review, design, and construction phases, the State will undertake public outreach through methods such as in person meetings, through social and print media, and through the GOSR website. Modifications have been made to GOSR's website to include project pages dedicated to the State's RBD projects. Each RBD project page has a subpage with project status updates and materials that are relevant to the project. Outreach may also be in-person meetings, solicitation of verbal and written comments, outreach events, online and traditional media, and through a CAC as appropriate throughout project design and implementation.

### **Outreach to Vulnerable Populations for Rebuild by Design**

The State continues to undertake specific measures to solicit input from low- and moderate- income households and households headed by non-English speaking persons. To do this, key meetings throughout the projects' development are advertised in various languages, and translators, as well as sign language interpreters, will be present, as needed. Notice of meetings will be posted in common areas of public housing and public buildings near the project site, and on the GOSR website. Meetings will be held in handicap accessible locations, and in locations served by public transportation. . Materials presented at meetings will be posted online for public viewing in a timely manner. To further ensure that RBD information is accessible to all residents, all program vital documents will be available in the four languages—English, Spanish, Chinese and Russian.

### **Citizens' Advisory Committee for Rebuild by Design**

The State is firmly committed to continuing to maintain community engagement for both RBD projects. The State has developed CACs to complement the public outreach described above. Each CAC serves an advisory role, meeting and receiving updates on the project as it progresses from conceptual development through environmental review into design and eventually through construction and completion. The CACs engage the wider community at key points in the project development and environmental review process. All CAC meetings are open and advertised to the public.

The CAC will continue to solicit public input through various methods, including as appropriate, toll-free phone lines, mobile recording and listening booths, social media, and other online tools, in addition to more traditional means such as giving presentations at governmental facilities, senior housing sites, public



housing sites, local community centers, schools and universities. To the greatest extent possible, the CAC and its public engagement events are coordinated with the citizen participation required for the environmental review and could extend into the building phases of the project. Additionally, technical staff and consultants from GOSR and other local, State, and federal agencies could make presentations and answer questions from community members in order to explain the highly technical components of each RBD project.

Forming a CAC is consistent with the model developed in the State's NYRCR Program, which was led by a community-based committee made up of local leaders and community residents. It is also consistent with New York State's two RBD projects. ~~The proposal for Living Breakwaters states that water hubs will be designed through community design charrettes. The~~ As of APA 28, the Living Breakwaters CAC has ~~been one of the entities providing~~ held nine public meetings to provide input ~~at these charrettes on the design and implementation of the project beyond their current commitments to the State.~~ As of March 2017, the LWTB CAC has met four times and consists of 21 representatives from communities across Long Island. As of APA 26, the LWTB CAC continues to meet on an ongoing basis in accordance with the State's Citizen Participation Plan for RBD.

## **Environmental Review for Rebuild by Design**

The State plans to engage in robust and open public engagement throughout the environmental review process to ensure that the projects comply with State and federal environmental requirements and consider sound environmental practices. The State will undertake the required environmental review process in accordance with the NEPA for each RBD project, which includes multiple opportunities for public review and comment. First, the State intends to hold public meetings on the draft scope for the process. These public meetings will abide by the notice and scheduling requirements set forth in 24 CFR 58.56 and 58.59. The State will accept both written and oral comments from the public on the draft scope, and the State will consider these comments when preparing the final scope of the projects. The purpose of these scoping public meetings is to allow community members and community organizations, the scientific and academic community along with the public as a whole, to raise issues and concerns to be evaluated in the environmental review process. This will ensure that the review is substantively robust, as well as responsive to any community issues with the projects. Once the environmental review process is completed the State will ensure that the community stays engaged in the process by soliciting, considering, and responding to public comments. The State is conducting a second round of public meetings and comment period following the completion of the Draft EIS. The State will also hold public meetings and comments with the RBD project-specific APA. As it prepares the final EIS, the State will consider and respond to the public comments.

On April 1, 2015, GOSR published the *Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, NY* EIS Draft Scope of Work<sup>xv</sup> for the Living Breakwaters project. Oral and written comments were received during the public scoping session held on April 30, 2015, by GOSR serving under the auspices of the New York State Homes and Community Renewal's Housing Trust Fund Corporation, and in accordance with HUD regulations at 24 CFR Part 58. GOSR accepted written comments to the EIS Draft Scope of Work through the public comment period which ended June 15, 2015. The EIS Final Scope of Work for the *Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, NY* was published on April 2, 2016.<sup>xvi</sup>

On March 24, 2017, GOSR published the Draft Environmental Impact Statement (DEIS) for the Living Breakwaters project. On March 31, the State submitted its Joint Permit Application to the USACE and ~~DEC~~ **NYSDR** for the project's major environmental permits. The timing of these actions reflects the fact that environmental permitting typically requires a project to have reached at least 30% design, and the permitting process runs concurrently with the NEPA process, as the permitting process relies on information

within the DEIS. ~~The USACE and DEC's review of On April 1, 2015, the permits will run, at minimum, concurrently with State published the public comment period and agency consultation~~ Coastal and Social Resiliency Initiatives for Tottenville Shoreline, Staten Island, NY – Environmental Impact Statement Draft Scope of Work<sup>xvii</sup> (Draft Scope of Work). The Final EIS was made available for public review on June 15, 2018 and the DEIS. As with any permitting process, it is expected that the USACE Record of Decision and Finding Statement was issued on August 31, 2018.

~~In December 2019 the New York State DEC will have questions and comments on issued its permit for the breakwaters component of the Living Breakwaters project. GOSR will promptly provide any additional information on the On October 12, 2018 the USACE issued a public notice regarding the project's permit application if so requested by the USACE or DEC. With the application currently submitted (ANAN-2017-00296-ESW) and the public was given an opportunity to regulatory agencies, it is anticipated that the USACE and DEC will issue provide comments. USACE issued it's permit in Q1 2021.~~

~~The permitting process for the permits for oyster installation component of the Living Breakwaters project began in accordance with Q1 2021, and, as of APA 28, DEC and USACE permits for this component are expected in Q3 2022. Construction of the schedule at Table 40. breakwaters component can begin before the oyster installation permits are received.~~

As of APA 26, the LWTB project's focus areas range from the preliminary design phase to final (100%) designs, and the project continues to move through the environmental review and permitting processes. Based on the available information pertaining to the projects that will be completed through LWTB, GOSR does not need to complete an EIS for the LWTB Project. Rather, GOSR is working to complete Environmental Assessments and to issue Findings of No Significant Impact for multiple projects and groups of projects. Environmental permitting and Environmental Assessments are performed as each LWTB focus area enters the 60% design stage and is expected to occur according to the schedule at Table 42 The three focus area groupings for Environmental Assessments are HLSP, which has received Authority to Use Grant Funds; Smith Pond, Lister Park, ERHS, East and West Boulevards, and the Greenway; and the Long Beach Wastewater Consolidation Project.

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<sup>i</sup> As set out in the November 18, 2013 FRN (FR 5696 N 06) p. 69107

<sup>ii</sup> [http://www.nyc.gov/html/sirr/downloads/pdf/final\\_report/Ch3\\_Coastal\\_FINAL\\_singles.pdf](http://www.nyc.gov/html/sirr/downloads/pdf/final_report/Ch3_Coastal_FINAL_singles.pdf)

<sup>iii</sup> [https://stormrecovery.ny.gov/sites/default/files/uploads/coastal\\_and\\_social\\_resiliency\\_initiatives\\_tottenville\\_draft\\_scope.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/coastal_and_social_resiliency_initiatives_tottenville_draft_scope.pdf)

<sup>iv</sup> [https://stormrecovery.ny.gov/sites/default/files/uploads/Coastal%20and%20Social%20Resiliency%20Initiatives%20-%20Tottenville%20FINAL%20SCOPE%20and%20RTC\\_1.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/Coastal%20and%20Social%20Resiliency%20Initiatives%20-%20Tottenville%20FINAL%20SCOPE%20and%20RTC_1.pdf)

<sup>v</sup> [https://stormrecovery.ny.gov/sites/default/files/uploads/Coastal%20and%20Social%20Resiliency%20Initiatives%20-%20Tottenville%20FINAL%20SCOPE%20and%20RTC\\_1.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/Coastal%20and%20Social%20Resiliency%20Initiatives%20-%20Tottenville%20FINAL%20SCOPE%20and%20RTC_1.pdf)

<sup>v</sup> <https://www.newyorkharborschool.org/crew/new-york-harbor-foundation/>

<sup>vi</sup> <https://www.hud.gov/sites/documents/HSREBUILDINGSTRATEGY.PDF>

<sup>vii</sup> <http://nvlpubs.nist.gov/nistpubs/specialpublications/NIST.SP.1190v1.pdf>

<sup>viii</sup> <http://reports.weforum.org/global-risks-2013/>

<sup>ix</sup> <http://www.unisdr.org/2014/campaign-cities/Resilience%20Scorecard%20V1.5.pdf> <http://www.unisdr.org/2014/campaign-cities/Resilience%20Scorecard%20V1.5.pdf>

<sup>x</sup> <https://www.rockefellerfoundation.org/report/city-resilience-framework/>

<sup>xi</sup> <http://www.governor.ny.gov/sites/governor.ny.gov/files/archive/assets/documents/NYS2100.pdf>

<sup>xii</sup> [http://www.dec.ny.gov/docs/administration\\_pdf/slrffinalrep.pdf](http://www.dec.ny.gov/docs/administration_pdf/slrffinalrep.pdf)

<sup>xiii</sup> <http://nysrise.org>

<sup>xiv</sup> <https://stormrecovery.ny.gov/sites/default/files/crp/community/documents/MOU-Tottenville%20Dune.pdf>

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<sup>xv</sup>[https://stormrecovery.ny.gov/sites/default/files/uploads/coastal\\_and\\_social\\_resiliency\\_initiatives\\_-\\_tottenville\\_draft\\_scope.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/coastal_and_social_resiliency_initiatives_-_tottenville_draft_scope.pdf)

<sup>xvi</sup>[https://stormrecovery.ny.gov/sites/default/files/uploads/Coastal%20and%20Social%20Resiliency%20Initiatives%20-%20Tottenville%20FINAL%20SCOPE%20and%20RTC\\_1.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/Coastal%20and%20Social%20Resiliency%20Initiatives%20-%20Tottenville%20FINAL%20SCOPE%20and%20RTC_1.pdf)

<sup>xvii</sup>[https://stormrecovery.ny.gov/sites/default/files/uploads/coastal\\_and\\_social\\_resiliency\\_initiatives\\_tottenville\\_draft\\_scope.pdf](https://stormrecovery.ny.gov/sites/default/files/uploads/coastal_and_social_resiliency_initiatives_tottenville_draft_scope.pdf)

## **Public Comments**

The Governor's Office of Storm Recovery (GOSR) posted Action Plan Amendment 28 (APA 28) for public comment on May 7, 2021. At that time, GOSR began accepting comments on the website [www.stormrecovery.ny.gov](http://www.stormrecovery.ny.gov), as well as through the mail. A Citizens' Advisory Committee briefing was held remotely on Zoom on May 19, 2021 and a public hearing was also held remotely on Zoom on May 25, 2021. The comment period officially ended at 5 pm on June 6, 2021.

The legal notices of these hearings and the comment period were published in the New York Post as well as in three local non-English newspapers, El Diario (Spanish), Russkaya Reklama (Russian) and Sing Tao (Simplified Chinese).

This Amendment was made accessible to persons with disabilities upon request (by telephone or in writing). Translations of APA 28 were available in Simplified Chinese, Russian and Spanish, the three most commonly used languages in the storm affected areas of New York State based on an analysis of Census data for households with members five years or older with limited English proficiency.

GOSR received comments related to APA 28 from 4 commenters at the Citizens' Advisory Committee briefing. Commenters may have submitted more than one comment as part of their submission. Comments are summarized and GOSR's responses are set out below.

### **Tottenville Shoreline Protection Project**

#### Comment

Commenters inquired about the status of the Tottenville Shoreline Protection Project (TSPP), including requesting clarification about the project's transfer to NYC Parks and the status of the boardwalk and pathway scope.

#### Response

The TSPP is a related project to Living Breakwaters per NEPA definitions, on the shoreline in front of the breakwaters that is being pursued by New York City, but it is not a part of the Living Breakwaters project. As explained on page 4 of APA 28, the State is removing the Tottenville Shoreline Protection Project (TSPP) as a Covered Project funded by the State's CDBG-DR allocation. The City of New York is pursuing additional funding to support the project through FEMA's Building Resilient Infrastructure and Communities (BRIC) grant program. The boardwalk and pathway scope remain a part of the TSPP scope and are not a part of the Living Breakwaters project. The Living Breakwaters project does include a shoreline restoration component, as explained on page 13 of APA 28.

### **Living Breakwaters**

#### Comment

One commenter inquired about the height of the breakwaters in the final, value-engineered design, in comparison to the previous design.

#### Response

The heights of the breakwaters in the value-engineered design are lower than the heights of the breakwaters in the previous design. As explained in pages 19 and 20 of APA 28, the State used modeling, including hydrodynamic modeling, as a risk management tool to review such matters as expected shoreline erosion

reduction and reversal as well as wave attenuation benefits of the value engineered designs. With regard to the reduction/reversal of erosion, completed shoreline modeling of the breakwaters system estimated that over a 20-year timeframe – including potential sea level rise of up to 30 inches – the beach adjacent to the shoreline protection elements would grow while still maintaining the shoreline within other parts of the project area. With regard to wave attenuation, completed modeling of the breakwaters have been designed to estimated that the breakwaters will - assuming up to 18 inches of sea level rise - reduce waves reaching on-shore buildings and roads to below 3 feet in height in the event of a 100-year storm. The modeling also indicates that the breakwaters will continue to provide risk management reduction through wave attenuation at higher levels of sea level rise as compared to a no-breakwaters scenario.

#### Comment

One commenter inquired about the educational components of the Living Breakwaters project, including the status of the Water Hub.

#### Response

Through APA 28, the State is adding educational walking tours, annual shoreline monitoring events, and a Living Breakwaters installation at Conference House Park, adjacent to the project site, as educational components of the project. These components are in addition to the existing school curriculums focused on the ecological benefits of oyster installations and associated field work opportunities. The State is removing the Water Hub component from the Living Breakwaters project. Implementation challenges identified through a feasibility study, and the fiscal constraints faced by the project have made this component infeasible. The State will meet the educational objectives of the project through the previously mentioned components.

#### Comment

One commenter inquired about whether the final designs will need to be re-permitted, or if permits would need to be amended, given the scope changes resulting from the value-engineering process.

#### Response

The New York State Department of Environmental Conservation (DEC) permit for the breakwaters component was issued on December 12, 2019, while the US Army Corps of Engineers (USACE) permit was subsequently issued on March 24, 2021. Because the footprint of the value engineered design is less than the previous design under which the permits were issued, and no additional impacts are expected, there is no need to re-permit the breakwaters component and construction can proceed as planned. The GOSR's Bureau of Environmental Review and Assessment (BERA) is in communication with DEC and USACE in regard to anticipated permit modifications, but these will not affect the construction timeline.

#### Comment

One commenter inquired about whether funding timing would impact the project's construction schedule.

#### Response

As explained in APA 28, the \$47 million funding gap between the project's CDBG-DR allocation and the estimated total cost of the project will be covered by additional State funding. The State will sequence project funding to ensure the CDBG-DR allocation for Living Breakwaters will be fully expended ahead of the September 2023 expenditure deadline, after which point the project will be completed with the additional State funding. The State will not need to halt construction due to funding timing.

Comment

One commenter inquired about plans for an upcoming public meeting about the Living Breakwaters project.

Response

The State is currently planning a public meeting for the Living Breakwaters after July 4, 2021, which will focus primarily on what the public can expect as in-water construction begins in Q3 2021. The State is currently working on gathering additional details on the specifics of the construction work to better inform the public. The CAC will be informed of the meeting date and details via email as they are finalized. In addition, construction updates will be provided to the Living Breakwaters CAC via email and will be posted on the GOSR website.