

TABLE ES-1: Jamaica Bay Watershed Protection Plan Implementation Strategies

Reduce Nitrogen Loading to the Tributaries and Jamaica Bay						
	Implementation Strategy	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Nitrogen Reduction & Other	<i>Carbon Addition</i>	NYCDEP will propose carbon addition at 26th Ward and Jamaica WPCPs as potential strategies to reduce nitrogen loadings during ongoing LTCP negotiations with NYSDEC.	TBD	TBD	N	DEP
	<i>Carbon Addition</i>	Interim temporary facilities at 26 th Ward will also be considered.	36-40 months	TBD	N	DEP
	<i>Minimize Centrate Processing from other WPCPs in Jamaica Bay</i>	NYCDEP will continue its efforts to minimize transshipment of sludge for processing in Jamaica Bay.	Ongoing	NA	NA	DEP
	<i>Algal and Sea Lettuce Harvesting Pilot Study</i>	Harvest excess algae and sea lettuce to reduce nitrogen and produce biodiesel fuels.	Design anticipated to begin Summer 2009.	\$387,000	Y	DEP
	<i>Algal Turf Scrubbers Pilot Study</i>	Remove nutrients and contaminants through benthic organisms, bacteria and phytoplankton.	Design anticipated to begin Summer 2009.	\$350,000	Y	DEP
	<i>Oyster Reef Pilot Study</i>	Provide clearer water, improved fisheries habitat through reintroduction of oyster reef.	Design anticipated to begin Summer 2008.	\$600,000	Y	DEP
	<i>Reintroduction of Eel Grass (Zostera marina) Pilot Study</i>	Fish habitat/Decreased wetland erosion loss.	Design anticipated to begin Summer 2008.	\$350,000	Y	DEP
	<i>Ribbed Mussel Pilot Study</i>	Improve water quality and increase fish habitat.	Design anticipated to begin Summer 2008.	\$300,000	Y	DEP
Reduce CSO and Other Discharges to Improve Pathogen and DO levels						
	Implementation Strategy	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Sewer System Maintenance	<i>Expanded Sewer Cleaning Program</i>	Clean sewers programmatically; entire sewer system would be cleaned every 7-10 years.	Pilot project 2007; annual program to clean 7% of sewers.	\$2.5 million annually plus new personnel and vehicles(\$876,500)	Partial	DEP
	<i>26th Ward/Fresh Creek Sewer Cleaning</i>	Clean sediment from selected sewers in 26th Ward.	Final design in 2007. Project scheduled to be completed in 2010.	\$4 million	Y	DEP
	<i>Expanded Interceptor Inspection and Maintenance</i>	Inspection program to determine cleaning and maintenance needs throughout the City. Pilot project in fall to inspect E Rockaway interceptor.	Pilot studies in 2008; Citywide inspection completed in 2010.	\$200,000 for pilot; \$4-5 million over next 1-2 years	Y	DEP
	Implementation Strategy	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Sewer & Treatment Facility Infrastructure Improvements	<i>26th Ward 50 MGD Expansion</i>	Increase wet weather capacity from 170 MGD to 220 MGD.	Final design in 2010. Project scheduled to be completed in 2015.	\$467 million	Partial	DEP
	<i>Paerdegat CSO Retention Basin</i>	50 MGD facility to capture CSOs.	Construction to be completed in 2012.	\$318 million	Y	DEP
	<i>Inflow/Infiltration Study with Corrective Measures</i>	Identify and resolve sewer system anomalies.	TBD	\$2 million/yr for engineering and \$5 million/yr for corrective measures	N	DEP
	<i>Regulators in Bergen Basin</i>	Automation for#2; enlarge #3 orifice; new 48" siphon under Belt Parkway.	Regulator #2 construction to begin in 2007. Remainder TBD.	\$14 million	Partial	DEP
	<i>Complete Sewer Separation in Rockaways</i>	Approximately 2,500 acres remain to be separated in the Rockaways	Ongoing	\$500 million	Partial	DEP

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New Sanitary and Storm Sewers	<i>Laurelton High Level Storm Sewers</i>	Separate storm sewers from sanitary sewers.	Drainage Plan completed by Jan 2008. Then cost and project timeline will be developed.	TBD	N	DEP, DDC
	<i>Warmerville / Meadowmere Sewer Project</i>	Sanitary sewers, pump station and force main to deliver sewage to Jamaica WPCP.	Under construction; to be completed in 2009.	\$30 million	Y	DEP
	<i>Jewel Streets Storm and Sanitary Sewers</i>	Install storm and sanitary sewers.	In Design	\$26 million	Partial	DEP, DDC
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
Boat Pumpouts	<i>Install a Third Boat Pumpout Facility at Rockaway WPCP</i>	Reduce wastewater discharges from recreational boats directly into Bay.	Operational for 2008 boating season.	\$21,500	Y	DEP
	<i>Seek 4th Boat Pump Out and a No Discharge Designation for Jamaica Bay</i>	Once a fourth boat pumpout facility has been installed, DEP will initiate proceedings to create a No Discharge Zone for Jamaica Bay.	TBD	TBD	N	DEP
Increase DO Levels to Improve Ecological Productivity						
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
Remove CSO Sediment Mounds	<i>Dredge and Recontour Hendrix Creek</i>	To address CSO mounds, DO and ecological goals.	Final Design complete. Dredging schedule TBD.	\$15.7 million	Partial	DEP
	<i>Pursue Dredging of Paerdegat Basin, Fresh Creek, Bergen Basin and Thurston Basin</i>	To address CSO mounds, DO and ecological goals.	TBD	\$203 million for aeration and dredging	Partial	DEP
	<i>Support Army Corps ecological restoration projects in Paerdegat Basin and Fresh Creek</i>	To address DO and ecological goals.	TBD	NA	NA	USACE
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
Dissolved Oxygen	<i>Pursue Aerators at Fresh Creek, Bergen Basin and Thurston Basin.</i>	Add oxygen to improve dissolved oxygen levels.	Design from 2015 to 2017. Construction from 2018 to 2021.	\$112.3 million	N	DEP
	<i>Investigate Potential for Future Aeration in other CSO and Non-CSO Tributaries</i>	Determine the need and efficacy of in-stream aeration for other creeks in Jamaica Bay.	TBD	TBD	N	DEP
Robust Scientific Monitoring						
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
	<i>Enhanced Scientific Monitoring Program</i>	Develop enhanced water quality and ecological monitoring program. Coordinate monitoring among various entities.	Announce enhanced monitoring program Oct 2008.	TBD	N	DEP with other agencies/

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Restoration Ecology						
	<i>Implementation Strategy</i>	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Salt Marsh Restoration	<i>Establish Salt Marsh Island Wetlands Priority Restoration Review Board</i>	Board would review restoration logistics and begin to establish a priority list of wetland restorations.	Review Board to be initiated shortly	NA	NA	Multi-agency
	<i>Marsh Island Wave Attenuator Pilot</i>	Install prefabricated attenuators to reduce wetland erosion loss.	Design anticipated to begin Summer 2009.	\$576,000	Y	DEP
	<i>Marsh Island Restoration</i>	Elders Point and others.	Summer 2008 - Elders Point	Elders Point: \$3 million from DEP - cost sharing from others.	Y (NYCDEP portion)	USACE, DEC, DEP
	<i>Implementation Strategy</i>	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Land Acquisition and Restoration Along Periphery of Bay	<i>Complete Restoration of Penn Avenue Landfill, Fountain Avenue Landfill, Paerdegat Basin and Springfield Lake</i>	Ecological restoration of public land.	Landfills currently in construction and will be completed in 2008; Paerdegat start construction 2009. See below for Springfield Lake.	\$20 million landfills; \$10 million Paerdegat.	Y	DEP
	<i>Transfer HPD Properties in the Edgemere Section of Queens to Parks</i>	Continue to transfer 10 acres of land; design and implement restoration project.	Transfer to occur shortly. Restoration efforts TBD.	TBD	N	DEP, HPD, DPR
	<i>Pursue Acquisition and Restoration Efforts in Other Periphery Areas</i>	Determine status of subject properties; design and implement stormwater BMPs or restoration.	Field verify sites, place holds on property within 6 mos. Restoration TBD.	TBD	N	Multi-agency
	<i>Acquire Seagirt Avenue Properties in Rockaway, Queens</i>	Leverage funds from multiple agencies to acquire lands.	TBD	NA	NA	Multi-agency
	<i>Update and Inventory Dune and Beach and Other Habitats</i>	Update inventory of existing habitats and coverage using GIS.	Begin inventory update in 2008; approximately 1 year to complete.	\$400,000	Y	DEP, other agencies
	<i>Expand Litter Removal and Reduction Programs</i>	Extend trash collection beyond Labor Day; NYCDEP sponsored clean-ups and plantings.	Ongoing	NA	NA	DEP, DPR
	<i>Reduce the Extent of Invasive Vegetation</i>	Promote the importance of invasive species management.	Ongoing	TBD	TBD	DEP, other agencies
	<i>Determine RTE Restoration Priorities and Targets</i>	Determine RTE Restoration Priorities and Targets in coordinate with relevant stakeholders.	Establish priorities species by October 2008.	NA	NA	DEP, other agencies

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On-Site BMPs for New and Existing Development						
	Implementation Strategy	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Pilot and Demonstration Projects	<i>Green Roof / Blue Roof Pilot Study</i>	Monitor effectiveness of blue roof vs. green roof on two existing commercial buildings. Compare results between blue and green roofs.	Design anticipated to begin late 2007.	\$352,500 for design/construction; Plus monitoring costs	Y	DEP
	<i>Rain Barrel Give-away Pilot Study</i>	Distribute 1,000 rain barrels to homeowners.	Design anticipated to begin Summer 2008.	\$138,000	Y	DEP
	<i>Parking Lot Pilot Study</i>	Two 1.5 acre parking lots retrofitted to comply with new DCP zoning regulations.	Design anticipated to begin late 2007.	\$290,000 for design/construction; Plus monitoring costs	Y	DEP
	<i>NYCHA or HPD Pilot Study</i>	Retrofit an existing NYCHA or HPD property with infiltration and detention BMPs.	Design anticipated to begin Summer 2009.	\$550,000	Y	DEP
	<i>Evaluate Rooftop Detention</i>	Promote on new construction; assess existing large rooftops.	Begin in late 2007.	\$40,000 (see also cost sharing below)	Y	DEP & SWCD
	<i>Porous Pavement on DEP Property</i>	Install and monitor pervious pavement on DEP facility parking lots and other areas.	Design anticipated to begin Summer 2008.	\$442,000	Y	DEP
	Implementation Strategy	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Economic Incentives	<i>Stormwater Rate Structure Study</i>	Evaluate alternative water, sewer, and stormwater rate structures and potential credit programs for BMPs.	Anticipated to begin in early 2008.	TBD	Anticipated shortly	DEP
	<i>Incentive Programs</i>	Being investigated under the Mayor's Interagency Task Force	Mayor's Interagency Task Force Report anticipated to be completed in Fall 2008.	NA	NA	Mayor's Office
	<i>Cost-Sharing Program Investigations</i>	Develop potential framework for design/build services incentive program.	Begin in late 2008.	\$40,000	Y	DEP & SWCD
	<i>Water Conservation Program</i>	60 MGD savings through low flow fixture rebates and cost sharing.	2008-2012	\$186 million	Partial	DEP
	Implementation Strategy	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Regulatory and Design Changes	<i>Zoning Code Parking Lot Design Requirements</i>	Add landscaping and bioretention components to commercial and community facility parking lots over 6,000 sf or 18 spaces.	Text change certified on June 18, 2007. Currently in approval process.	NA	NA	DCP with DEP and DPR
	<i>Code Review</i>	Review Sewer Code and make recommendations for potential revisions to facilitate BMP installation.	Anticipated to begin Summer 2008.	\$1 million (including BMP Design Manual)	Y	DEP
	<i>BMP Design Manual</i>	Create companion guidance document to sewer code revisions specific to NYC conditions.	Anticipated to begin Summer 2008.	Part of Code Review cost	Y	DEP
	<i>CEQR Technical Manual Revision</i>	Revise CEQR Technical Manual to include a specific section to address proposed developments in Jamaica Bay.	End of FY 2008	NA	NA	DEP/OEC
	<i>Monitor Benefits of BMP Implementation</i>	Develop indicators to track effects of BMP installations throughout the City over time.	To begin once implementation strategies begin.	TBD	TBD	DEP & Mayor's Office
	<i>Zoning Code Pervious Surfaces Requirements</i>	Potential front yard pervious requirements in R1-R5 zoning districts.	Fall 2007	NA	NA	DCP

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Off-Site BMPs on Streets, Sidewalks, Highway Right-of-Ways, and Vacant Lands						
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
Pilot and Demonstration Projects	<i>Belt Parkway Bridges Demonstration Project</i>	Attenuate and reduce the direct stormwater discharge through BMPs.	In design	\$95,000 for design; \$1.2 million for construction	Y	DEP, DOT
	<i>Streetside Infiltration Swales Pilot Study</i>	Install three swales on six sites to capture runoff from a roadway.	Design anticipated to begin late 2007.	\$510,000 for design/construction; Plus monitoring costs	Y	DEP
	<i>Constructed Wetlands Pilot Study</i>	Construct wetland to capture runoff from a roadway.	Design anticipated to begin late 2007.	\$510,000 for design/construction; Plus monitoring costs	Y	DEP
	<i>Tree Pit Pilot Study</i>	Install five enhanced tree pits with stormwater subsurface cistern.	Design anticipated to begin late 2007.	\$112,500 for design/construction; Plus monitoring costs	Y	DEP
	<i>Vacant Parcels Pilot Study</i>	Implement stormwater parks on additional publicly-owned vacant parcels to capture stormwater runoff.	TBD based on Constructed Wetlands Pilot Study.	TBD	N	DEP
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
Regulatory	<i>Zoning Code Review - Street Trees</i>	Potential requirement for new developments/enlargements to provide street trees.	Fall 2007	NA	NA	DCP
	<i>Implementation Strategy</i>	<i>Description</i>	<i>Schedule</i>	<i>Estimated NYCDEP Cost</i>	<i>Funded?</i>	<i>Agency</i>
Open Space and Greening Projects	<i>PlaNYC Street Tree Planting</i>	Street tree planting throughout the city including Jamaica Bay watershed.	23,000 trees planted annually citywide.	NA	NA	DPR & Mayor's Office
	<i>PlaNYC Greenstreets Initiative</i>	Fourteen new Greenstreets within Jamaica Bay watershed.	Fall 2007; 3,000 new Greenstreets citywide by 2017.	NA	NA	DPR & Mayor's Office
	<i>East New York Community Forestry Management Plan</i>	Increase street tree stocking level in East New York.	Plant 850 trees in Brooklyn CB 5 over next 10 years through PlaNYC Street Tree Initiative.	NA	NA	DPR & Mayor's Office
	<i>Baisley Pond Park Project</i>	Using stormwater BMPs, storm sewers will route stormwater into Baisley Pond.	Slated for construction in 2010.	\$3-4 million (estimated)	Y	DEP
	<i>Springfield Park Project</i>	Using stormwater BMPs, storm sewers will route stormwater into Springfield Lake.	In Design; construction is slated to begin in 2009.	\$15 million (estimated)	Y	DEP

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Public Education and Outreach						
	<i>Implementation Strategy</i>	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Raise Awareness	<i>Enhance Jamaica Bay-related Educational Curriculum</i>	Educational Resource Directory	Prototype to be completed late 2007.	\$6,000	Y	DEP, NYCSWCD
	<i>Organize "State of the Bay" Scientific Symposium</i>	Coordinate/guide scientific investigations and report scientific findings. Inform Plan updates.	First symposium Summer 2008.	\$20,000 not including venue	Partial	DEP, NYCSWCD
	<i>Create a targeted campaign for developers, residents, and business owners to protect Jamaica Bay</i>	Brochure on importance of the Bay, human activities in watershed, and pollutant reducing practices.	Brochure to be completed in late 2007.	\$6,000	Y	DEP, NYCSWCD
Public Use and Enjoyment						
	<i>Implementation Strategy</i>	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Public Access	<i>Rockaway /Gateway Greenway</i>	Establish an approximately 20-mile continuous greenway loop around the Bay.	Some portions are complete or nearing completion, others are to be determined.	NA	NA	DOT, DPR
	<i>Laurelton and Cross Island Parkway Greenways</i>	Establish a 22-mile path through parkland; link between Brooklyn/Queens Greenway and Jamaica Bay waterfront.	Phase I was completed in 2006; Phase II is pending additional funding	NA	NA	DOT, DPR
	<i>Southern Parkway Path and Conduit Boulevard</i>	Establish a greenway to connect Brooklyn/Queens Greenway system to Jamaica Bay waterfront.	TBD	NA	NA	DOT, DPR
	<i>Far Rockaway North Shore Greenway</i>	Establish a greenway to connect Far Rockaway with Rockaway Gateway Greenway	In process with current HUD development.	NA	NA	HUD
	<i>Floyd Bennett Field/Gateway National Recreation Area</i>	Capital projects within Gateway National Recreation Area.	TBD	NA	NA	NPS
	<i>Brooklyn/Queens Greenway -Eastern Parkway Extension</i>	Greenway improvement including landscaping, multi-use paths, bike racks, pedestrian ramps, traffic signals, etc.	Design underway; to be completed in June 2010.	NA	NA	DOT, DPR, DCP
Implementation and Coordination						
	<i>Implementation Strategy</i>	Description	Schedule	Estimated NYCDEP Cost	Funded?	Agency
Plan Implementation	<i>Jamaica Bay Water Quality and Ecological Restoration Steering Committee</i>	Under Harbor Estuary Program organizational structure.	TBD	NA	N	Multi-agency
	<i>BMP Implementation through Mayor's Office Interagency BMP Task Force</i>	Mayor's BMP Task Force to coordinate BMP implementation strategies.	Ongoing	NA	NA	Multi-agency
	<i>Education Steering Committee</i>	Continue committee's efforts to implement education and outreach strategies.	Ongoing	\$75,000	Partial	DEP, NYCSWCD
	<i>Monitor and Review Changes to the Watershed</i>	Track new development, BMP implementation, and overall growth in the watershed in coordination with other agencies.	Ongoing	TBD	N	DEP/OEC