



the
WATERS
we
SHARE

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

**Appendix I
Cost Engineering**

**Final Integrated Feasibility Report &
Environmental Assessment
April 2020**

**Prepared by the New York District
U.S. Army Corps of Engineers**



THE PORT AUTHORITY
OF NY & NJ

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

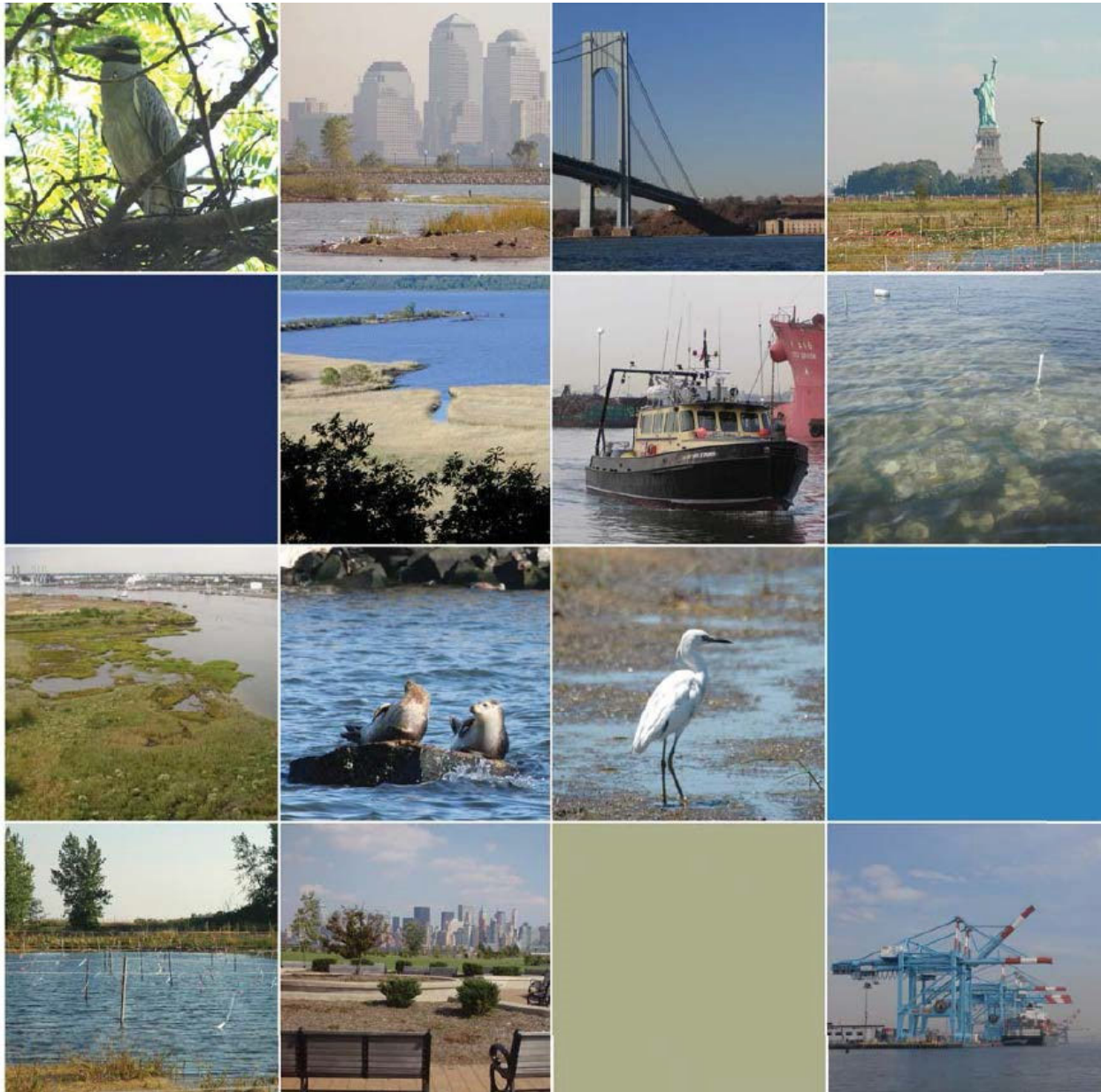




Table of Contents

1. Introduction	1
1.1. Price Levels.....	7
1.2. Contingencies	7
1.3. Lands and Damages (Account 01).....	8
1.4. Cultural Resources Preservation (Account 18)	8
1.5. Planning Engineering and Design (Account 30).....	9
1.6. Construction Management (Account 31).....	9
1.7. Monitoring	10
1.8. Adaptive Management	10
2. Total First Costs	10
3. Construction Schedule and Windows.....	22
3.1. July Mobilization	22
3.2. January Mobilization.....	22
3.3. March/April Mobilization	24
3.4. Planting Windows.....	24
4. Cost Summary	25

List of Tables

Table I-1. Alternative Phase First Cost Summary.....	1
Table I-2. Selected Plans.....	5
Table I-3. Cost Estimate Packages	6
Table I-4. Contingency Factors.....	7
Table I-5. Account 18 – Cultural Resources Preservation Costs	11
Table I-6. First Cost - Hudson Raritan Estuary Recommended Plan.....	11
Table I-7. First Cost – Dead Horse Bay	12
Table I-8. First Cost – Fresh Creek	12
Table I-9. First Cost – Duck Point.....	13
Table I-10. First Cost – Stony Creek	13
Table I-11. First Cost – Pumpkin Patch West.....	14
Table I-12. First Cost – Pumpkin Patch East.....	14
Table I-13. First Cost – Elders Center	15
Table I-14. First Cost – Flushing Creek	15
Table I-15. First Cost – Bronx Zoo and Dam	16
Table I-16. First Cost – Stone Mill Dam.....	16
Table I-17. First Cost – Shoelace Park.....	17
Table I-18. First Cost – Bronxville Lake.....	17
Table I-19. First Cost – Garth Woods / Harney Road	18
Table I-20. First Cost – Oak Island Yards.....	18
Table I-21. First Cost – Essex County Branch Brook Park	19
Table I-22. First Cost – Metromedia Tract	19

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-23. First Cost – Meadowlark Marsh	20
Table I-24. First Cost – Naval Weapons Station Earle	20
Table I-25. First Cost – Bush Terminal	21
Table I-26. First Cost – Head of Jamaica Bay	21
Table I-27. HRE Construction Schedule	24
Table I-28. HRE Construction Schedule Budget.....	24
Table I-29. Total Project Cost Summary	26
Table I-30. Total Project Cost Summary – Dead Horse Bay.....	27
Table I-31. Total Project Cost Summary – Fresh Creek	28
Table I-32. Total Project Cost Summary – Duck Point	29
Table I-33. Total Project Cost Summary – Stony Creek	30
Table I-34. Total Project Cost Summary – Pumpkin Patch West.....	31
Table I-35. Total Project Cost Summary – Pumpkin Patch East.....	32
Table I-36. Total Project Cost Summary – Elders Center	33
Table I-37. Total Project Cost Summary – Flushing Creek.....	34
Table I-38. Total Project Cost Summary – Bronx Zoo and Dam.....	35
Table I-39. Total Project Cost Summary – Stone Mill Dam.....	36
Table I-40. Total Project Cost Summary – Shoelace Park	37
Table I-41. Total Project Cost Summary – Bronxville Lake.....	38
Table I-42. Total Project Cost Summary – Garth Woods/Harney Road.....	39
Table I-43. Total Project Cost Summary – Oak Island Yards	40
Table I-44. Total Project Cost Summary – Essex County Branch Brook Park.....	41
Table I-45. Total Project Cost Summary – Metromedia Tract.....	42
Table I-46. Total Project Cost Summary – Meadowlark Marsh.....	43
Table I-47. Total Project Cost Summary – Naval Weapons Station Earle	44
Table I-48. Total Project Cost Summary – Bush Terminal.....	45
Table I-49. Total Project Cost Summary – Head of Jamaica Bay	46

Attachments

A. MII Reports

Acronyms and Abbreviations

CSRA	Cost Schedule Risk Analysis
HRE	Hudson Raritan Estuary
MCACES	Micro-Computer Aided Cost Estimating System
USACE	United States Army Corps of Engineer



1. Introduction

Hudson Raritan Estuary (HRE) is an ecosystem restoration project located within the boundaries of the Port District of New York and New Jersey, and situated within a 25-mile radius of the Statue of Liberty National Monument. The Project Delivery Team (PDT) evaluated a total of 33 restoration sites that were identified as the initial array of sites (See Plan Formulation Appendix D). Three alternatives were typically developed for each site and the project first cost for each alternative is summarized in Table I-1 below. The project contingencies for these alternatives were developed thru Abbreviated Risk Analysis (ARA) tool provided by the Cost MCX. The project first cost listed under Table I-1 includes the project contingencies.

Table I-1. Alternative Phase First Cost Summary

Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
Jamaica Bay Perimeter ¹	Dead Horse Bay	1	-	-	\$23,615,000	-	\$1,269,000
		2	-	-	\$26,197,000	-	\$1,407,000
		3	-	-	\$31,864,000	-	\$1,712,000
		4	\$82,697,602	\$1,848,360	\$84,545,962	\$80,000	\$3,330,851
	Fresh Creek	1	-	-	\$5,057,000	-	\$272,000
		2	-	-	\$5,231,000	-	\$281,000
		3	-	-	\$8,388,000	-	\$451,000
		4	-	-	\$8,259,000	-	\$444,000
		5	\$33,148,455	\$737,068	\$33,885,522	\$80,000	\$1,382,939
	Brant Point	1	-	-	\$2,091,000	-	\$112,000
		2	\$6,425,941	\$155,406	\$6,581,347	\$20,000	\$273,007
	Hawtree Point	1	\$1,981,636	\$150,000	\$2,131,636	\$20,000	\$101,510
	Bayswater State Park	1	-	-	\$1,007,000	-	\$54,000
		2	\$5,766,391	\$150,000	\$5,916,391	\$20,000	\$247,399
		3	-	-	\$3,751,000	-	\$202,000
		1	-	-	\$1,464,000	-	\$79,000

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
	Dubos Point	2	-	-	\$2,192,000	-	\$118,000
		3	\$9,585,028	\$214,028	\$9,799,056	\$20,000	\$396,781
Jamaica Bay Marsh Islands	Duck Point	1	\$20,847,701	\$473,882	\$21,321,583	\$50,000	\$869,796
		2	\$23,408,019	\$532,104	\$23,940,123	\$50,000	\$970,476
		3	\$28,182,992	\$640,688	\$28,823,679	\$50,000	\$1,158,245
	Stony Creek	1	\$22,218,071	\$515,297	\$22,733,369	\$50,000	\$924,034
		2	\$17,973,727	\$416,821	\$18,390,547	\$50,000	\$757,065
		3	\$15,770,046	\$365,691	\$16,135,738	\$50,000	\$670,374
	Pumpkin Patch West	1	\$14,027,060	\$333,372	\$14,360,432	\$50,000	\$614,934
		2	\$20,504,279	\$487,409	\$20,991,688	\$50,000	\$875,808
		3	\$26,710,462	\$634,999	\$27,345,461	\$50,000	\$1,125,766
	Pumpkin Patch East	1	\$30,400,272	\$693,870	\$31,094,142	\$50,000	\$1,245,530
		2	\$17,068,819	\$389,499	\$17,458,318	\$50,000	\$721,250
		3	\$23,653,276	\$539,829	\$24,193,105	\$50,000	\$980,194
	Elders Center	1	\$14,516,762	\$347,914	\$14,864,676	\$50,000	\$621,457
		2	\$14,303,695	\$342,804	\$14,646,500	\$50,000	\$613,069
		3	\$20,411,448	\$489,273	\$20,900,721	\$50,000	\$853,506
Harlem River, East River and Western Long Island Sound	Flushing Creek	A	\$8,399,122	\$150,000	\$8,549,122	\$80,000	\$404,470
		B	\$13,204,697	\$309,022	\$13,513,719	\$80,000	\$592,618
		C	\$16,113,674	\$378,139	\$16,491,813	\$80,000	\$705,583
	Bronx Zoo and Dam	A	\$6,161,341	\$150,000	\$6,311,341	\$20,000	\$255,948
		B	\$4,784,598	\$150,000	\$4,934,598	\$20,000	\$204,371
		C	\$3,691,719	\$150,000	\$3,841,719	\$20,000	\$163,428



Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
	Stone Mill Dam	A	\$779,827	\$150,000	\$929,827	\$20,000	\$54,241
		B	\$708,351	\$150,000	\$858,351	\$20,000	\$51,572
		C	\$540,223	\$150,000	\$690,223	\$20,000	\$45,295
	Shoelace Park	A	\$24,961,173	\$545,406	\$25,506,579	\$20,000	\$1,006,948
		B	\$18,530,516	\$404,768	\$18,935,284	\$20,000	\$760,408
		C	\$8,920,217	\$195,935	\$9,116,152	\$20,000	\$362,013
	Bronxville Lake	A	\$21,281,995	\$464,614	\$21,746,610	\$50,000	\$864,975
		B	\$14,381,709	\$313,706	\$14,695,415	\$50,000	\$600,726
		C	\$14,302,390	\$311,971	\$14,614,361	\$50,000	\$597,688
	Garth Harney	A	\$7,336,979	\$312,399	\$7,649,378	\$20,000	\$305,228
		B	\$6,547,824	\$300,000	\$6,847,824	\$20,000	\$275,274
		C	\$3,917,834	\$300,000	\$4,217,834	\$20,000	\$176,858
	River Park/ West Farm Rapids Park	A	\$4,114,139	\$150,000	\$4,264,139	\$20,000	\$179,079
		B	\$4,056,461	\$150,000	\$4,206,461	\$20,000	\$176,920
		C	\$2,670,590	\$150,000	\$2,820,590	\$20,000	\$125,060
	Muskrat Cove	A	\$7,942,235	\$179,193	\$8,121,428	\$20,000	\$348,155
		B	\$8,143,118	\$182,495	\$8,325,614	\$20,000	\$356,245
		C	\$4,186,585	\$150,000	\$4,336,585	\$20,000	\$202,470
	Crestwood Lake	A	\$27,452,116	\$599,718	\$28,051,834	\$50,000	\$1,123,787
		B	\$13,666,095	\$298,869	\$13,964,964	\$50,000	\$584,571
		C	\$12,807,222	\$279,436	\$13,086,658	\$50,000	\$550,928
		A	\$24,707,587	\$540,188	\$25,247,775	\$50,000	\$996,182
		B	\$14,692,572	\$321,161	\$15,013,732	\$50,000	\$612,653

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
	Westchester County Center	C	\$13,695,728	\$299,360	\$13,995,088	\$50,000	\$574,478
Newark Bay, Hackensac k River and Passaic River	Oak Island Yards	A	\$18,173,963	\$397,189	\$18,571,152	\$50,000	\$753,781
		B	\$18,739,873	\$409,811	\$19,149,684	\$50,000	\$775,704
		C	\$17,702,790	\$387,130	\$18,089,921	\$50,000	\$735,543
	Branch Brook Park	A	\$71,649,492	\$1,566,145	\$73,215,637	\$80,000	\$2,857,716
		B	\$71,714,594	\$1,567,569	\$73,282,163	\$80,000	\$2,860,240
		C	\$22,130,218	\$483,165	\$22,613,383	\$80,000	\$937,928
		D	\$46,399,651	\$1,013,934	\$47,413,586	\$80,000	\$1,855,027
	Clifton Dundee Canal Green Acres	A	\$8,881,501	\$171,710	\$9,053,210	\$20,000	\$363,553
		B	\$8,270,796	\$161,671	\$8,432,467	\$20,000	\$339,990
		C	\$7,238,061	\$150,000	\$7,388,061	\$20,000	\$300,325
	Dundee Island Park	A	\$2,621,005	\$150,000	\$2,771,005	\$20,000	\$124,161
	Kearny Point	A	\$50,998,310	\$1,113,686	\$52,111,997	\$80,000	\$2,057,073
		B	\$46,128,926	\$1,007,194	\$47,136,120	\$80,000	\$1,868,294
		C	\$39,470,487	\$861,574	\$40,332,061	\$80,000	\$1,610,156
	Metromedia Tract	A	\$27,733,012	\$605,205	\$28,338,217	\$50,000	\$1,137,241
		B	\$45,413,789	\$991,882	\$46,405,671	\$80,000	\$1,860,425
		C	\$30,991,135	\$676,460	\$31,667,595	\$80,000	\$1,294,977
	Meadowlark Marsh	A	\$63,974,334	\$1,398,947	\$65,373,280	\$80,000	\$2,588,139
		B	\$58,407,208	\$1,277,194	\$59,684,403	\$80,000	\$2,369,877
		C	\$46,725,473	\$1,021,716	\$47,747,190	\$80,000	\$1,911,889



Planning Region/ Habitat	Site	Alt	Sub-Total Project First Cost (\$)	Monitoring and Adaptive Management Cost (\$)	Project First Cost (\$)	Annualized OMRR&R Cost (\$)	Average Annual Economic Cost (\$)
Oysters	Naval Weapons Station Earle	A	\$1,075,750	\$150,000	\$1,225,750	\$10,000	\$55,108
		B	\$2,099,310	\$150,000	\$2,249,310	\$10,000	\$93,239
		C	\$3,438,265	\$81,652	\$3,519,917	\$10,000	\$141,160
	Bush Terminal	A	\$3,105,071	\$118,328	\$3,223,398	\$10,000	\$129,449
		B	\$4,555,260	\$126,994	\$4,682,254	\$10,000	\$183,836
		C	\$8,960,603	\$153,319	\$9,113,921	\$10,000	\$350,169
	Head of Jamaica Bay	A	\$1,098,250	\$150,000	\$1,248,250	\$10,000	\$55,898
		B	\$2,115,129	\$150,000	\$2,265,129	\$10,000	\$93,738
		C	\$3,175,638	\$118,758	\$3,294,396	\$10,000	\$132,220

¹Cost estimates for Jamaica Bay Perimeter site alternatives in italics represent 2008 implementation costs and benefits used in the CE/ICA conducted to select the TSP approved at the 2010 Alternative Formulation Briefing. TSP alternative costs and benefits were then updated in 2018 for use in subsequent evaluations.

Table 1-2 below presents the Recommended Plan alternatives that resulted from the Cost Effectiveness/Incremental Cost Analysis (Appendix) that were optimized further. The optimized plan provides solutions to restore lost or degraded aquatic habitats within the HRE study area.

Table I-2. Selected Plans

Site	Alternative Selected
Jamaica Bay – Perimeter Sites	
Dead Horse Bay	4
Fresh Creek	5
Jamaica Bay – Marsh Islands	
Duck Point	2
Stony Creek	1
Pumpkin Patch West	2
Pumpkin Patch East	3
Elders Center	3
Flushing Creek	
Flushing Creek	B

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Site	Alternative Selected
Bronx River	
Bronx Zoo and Dam	A
Stone Mill Dam	A
Shoelace Park	B
Bronxville Lake	B
Garth Wood/Harney Road	A
Lower Passaic River	
Oak Island Yards	A
Essex County Branch Brook Park	D
Hackensack River	
Metromedia Tract	A
Meadowlark Marsh	C
Oyster Restoration	
Naval Weapons Station Earle	C
Bush Terminal	C
Head of Jamaica Bay	C

Table 1-3 below presents the Cost Estimate Packages assembled for the proposed restoration for the Recommended Plan. The Recommended Plan includes 20 different ecosystem restoration sites/projects spanning five (5) planning regions. These cost estimates have been prepared as five (5) separate cost estimate packages which address the following planning regions: Jamaica Bay, Flushing Creek, Bronx River, Hackensack River & Lower Passaic River, and Oyster Sites.

Table I-3. Cost Estimate Packages

Cost Estimate Package	Planning Region	Study Site Name
Jamaica Bay	Perimeter Sites	Dead Horse Bay
		Fresh Creek
	Marsh Islands	Duck Point
		Stony Creek
		Pumpkin Patch West
		Pumpkin Patch East
		Elders Center
Flushing Creek	Flushing Creek	Flushing Creek
Bronx River	Bronx River	Bronx Zoo and Dam
		Stone Mill Dam
		Shoelace Park
		Bronxville Lake
		Garth Woods/Harney Road
Hackensack River & Lower Passaic River	Lower Passaic River	Oak Island Yards
		Essex County Branch Brook Park
	Hackensack River River	Metromedia Tract



Cost Estimate Package	Planning Region	Study Site Name
		Meadowlark Marsh
Oyster Sites	Oyster Sites	Naval Weapons Station Earle
		Bush Terminal
		Head of Jamaica Bay

Each cost package is composed of the following items:

- Jamaica Bay costs and contingencies for the five (5) sites at the Marsh Islands and two (2) sites at the Perimeter Sites.
- Flushing Creek cost and contingency for a single site.
- Bronx River costs and contingencies for the five (5) sites.
- Hackensack River & Lower Passaic River costs and contingencies for the two (2) sites at the Hackensack River and two (2) sites at the Lower Passaic River.
- Oyster Sites costs and contingencies for the three (3) sites.

For all sites, the following cost accounts apply:

1.1. Price Levels

Costs were presented as current year (October 2019/FY2020) dollar values without escalation.

1.2. Contingencies

As stated in ER 1110-2-1302, the goal in contingency development is to identify the uncertainty associated with an item of work or task to an acceptable degree of confidence. Consideration must be given to the detail available at each stage of planning, design or construction for which a cost estimate is being prepared. Contingency may vary throughout the cost estimate and could constitute a significant portion of the overall costs when data or design details are unavailable. Final contingency development and assessment of the potential for cost growth is included in the cost estimate. To develop the Total Project First Cost, contingencies developed in the Cost Schedule Risk Analysis (CSRA) were applied. The CSRA report was developed for the risk findings and the recommended contingencies for the project. The construction cost contingency developed per CSRA for each ecosystem restoration type is shown in Table I-4. Note that the

Table I-4. Contingency Factors

Ecosystem Restoration Type	Contingency Factors
Jamaica Bay Marsh Islands	25%
Jamaica Bay Perimeter Sites	22%
Flushing Creek	23%
Bronx River	29%
Hackensack River	21%
Lower Passaic River	25%
Oyster Restoration Sites	37%

1.3. Lands and Damages (Account 01)

Site-specific real estate costs were developed for each component/site. Fee title and temporary easements will be acquired (no permanent easements will be acquired) per ER 1105-2-100 Sec. 3-5(b)(9) and ER 405-1-12. Real estate costs include land acquisition and incidental (i.e., appraisals, land surveys, title services, etc.) costs. Details related to the real estate costs can be found in the Real Estate Plan.

1.4. Cultural Resources Preservation (Account 18)

In accordance with the National Environmental Policy Act and the National Historic Preservation Act (54 USC 306108) federal agencies are to avoid, preserve, protect, minimize or compensate for impacts to National Register of Historic Places eligible or listed sites where an undertaking will result in adverse effect to the resource. Cultural Resources mitigation costs were developed for each recommended site alternative in accordance with ER 1105-2-100. Survey and mitigation estimates include archaeological investigations, architectural surveys, and data recovery. Estimates were developed using existing information and assumptions about the level of mitigation required at each site depending on the scale of the undertaking proposed in each alternative as well as the presence of historic properties and potential for buried archaeological sites within a given area, refer to the Cultural Resources Appendix for a detailed discussion of potential cultural resources impacts at each site (See Appendix H).

All costs incurred by the government for actions associated with historic preservation, including, but not limited to, the identification and treatment of historic properties, and the mitigation of adverse effects, will be included in construction costs. These costs, not including the costs for data recovery, are cost-shared in accordance with other project costs. Data recovery refers to the intensive excavation of an archaeological site to retrieve information from the site to mitigate for adverse effects to that archaeological site. Data recovery costs are a full federal costs and are not cost-shared and are subject to a cap of 1% of the total federal project cost. Data recovery costs in excess of 1% are subject to review and a waiver in accordance with ER 1105-2-100. Based upon current estimates, data recovery costs for this project will not exceed the 1% cap.

Table I-5 – Account 18 - Cultural Resources Preservation Costs

Site	Account 18a: Survey and Mitigation (Not Data-recovery)	Account 18b: Mitigation (Data-recovery)
Jamaica Bay – Perimeter Sites		
Dead Horse Bay	\$175,000	\$100,000
Fresh Creek	\$250,000	\$75,000
Jamaica Bay – Marsh Islands		
Duck Point	\$15,000	\$0
Stony Creek	\$15,000	\$0
Pumpkin Patch West	\$15,000	\$0
Pumpkin Patch East	\$15,000	\$0
Elders Center	\$15,000	\$0



Site	Account 18a: Survey and Mitigation (Not Data-recovery)	Account 18b: Mitigation (Data-recovery)
Flushing Creek		
Flushing Creek	\$600,000	\$50,000
Bronx River		
Bronx Zoo and Dam	\$125,000	\$25,000
Stone Mill Dam	\$225,000	\$25,000
Shoelace Park	\$150,000	\$50,000
Bronxville Lake	\$175,000	\$75,000
Garth Wood/Harney Road	\$225,000	\$25,000
Lower Passaic River		
Oak Island Yards	\$75,000	\$0
Essex County Branch Brook Park	\$50,000	\$150,000
Hackensack River		
Metromedia Tract	\$50,000	\$0
Meadowlark Marsh	\$125,000	\$100,000
Oyster Restoration		
Naval Weapons Station Earle	\$100,000	\$25,000
Bush Terminal	\$110,000	\$15,000
Head of Jamaica Bay	\$110,000	\$15,000
Total	\$2,620,000	\$730,000

1.5. Planning Engineering and Design (Account 30)

Planning, Engineering and Design account includes costs for the Pre-construction Engineering and Design (PED) Phase and engineering support during construction. Costs were developed for each site specific alternative including costs related to regulatory compliance, field data collection, and preparation of design plans, documentation, and specifications for all alternatives. It includes all the in-house labor based upon work-hour requirements, material and facility costs, travel, and overhead.

1.6. Construction Management (Account 31)

Costs were developed for all construction management activities from pre-award requirements through final contract closeout. This cost includes in-house labor based upon work-hour requirements, materials, facility costs, support contracts, travel, and overhead. The cost was developed based on input from the construction division in accordance with Civil Works Breakdown Structure and includes, but is not limited to, anticipated items such as the salaries of the resident engineer and staff, surveyors, inspectors, drafters, clerical, and custodial personnel; operation, maintenance, and fixed charges for transportation and for other field equipment; field supplies; construction management, general construction supervision; and project office administration, distributive cost of area office, and general overhead charged to

the project. This account also includes engineering support during construction through project completion.

1.7. Monitoring

Monitoring costs are required by ER 1105-2-100 Sec. 3-5.b. (8). Implementation Guidance issued August 31, 2009 for Section 2039 of Water Resource Development Act (WRDA) 2007 (as amended by Section 1161 of WRDA 2016) directs the Secretary of the Army to ensure, when conducting a feasibility study for a project (or component of a project) under the USACE ecosystem restoration mission that the decision document include a monitoring plan to measure the success of the ecosystem restoration. Monitoring the success of a restoration project can be complex as restored wetlands can take a myriad of growing seasons to reach dynamic equilibrium conditions; therefore, the initial monitoring period of five years will ensure the site is on a trajectory toward ecological success. A detailed breakdown of the monitoring efforts required for each project site is provided in the Monitoring and Adaptive Management Plan.

1.8. Adaptive Management

Section 2039 of WRDA 2007 directs USACE to develop an adaptive management plan for all ecosystem restoration projects. A detailed breakdown of the assumed adaptive management efforts required for each project site is provided in the Monitoring and Adaptive Management Plan.

2. Total First Costs

The construction cost estimate was developed in MCACES, Second Generation (MII) using the appropriate Work Breakdown Structure (WBS) and based on current estimated quantities provided by the Hydraulics & Hydrology Engineers (Engineering Appendix). The cost estimate was developed from these quantities using cost resources such as RSMeans, historical data from similar construction features, and MII Cost Libraries. The contingencies were developed based on input to the Cost Schedule Risk Analysis (CSRA) (template provided by the Cost Mandatory Center of Expertise, MCX, Walla Walla District). These contingencies were applied to the construction cost estimates to develop the Total Project First Cost. The total project first cost for the entire HRE Recommended Plan is presented in Table I-6. The first costs for each ecosystem restoration project site is presented in Table I-7 thru Table I-26.



Table I-6. First Cost - Hudson Raritan Estuary Recommended Plan
Hudson Raritan Estuary
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 6,264,950	31%	\$ 1,943,070	\$ 8,208,020
	Total Lands & Damages	\$ 6,264,950		\$ 1,943,070	\$ 8,208,020
06	Fish and Wildlife Facilities	\$ 8,334,831	37%	\$ 3,083,887	\$ 11,418,718
	Total Fish and Wildlife Facilities	\$ 8,334,831		\$ 3,083,887	\$ 11,418,718
16	Bank Stabilization	\$ 225,157,934	24%	\$ 54,374,825	\$ 279,532,759
	Total Bank Stabilization	\$ 225,157,934		\$ 54,374,825	\$ 279,532,759
18	Cultural Resource	\$ 3,350,000	26%	\$ 884,500	\$ 4,234,500
	Total Cultural Resource	\$ 3,350,000		\$ 884,500	\$ 4,234,500
30	Planning, Engineering & Design	\$ 36,375,000	26%	\$ 9,556,650	\$ 45,931,650
31	Construction Management	\$ 34,826,618	25%	\$ 8,695,238	\$ 43,521,856
Sub-Total First Cost		\$ 314,309,333		\$ 78,538,171	\$ 392,847,504
	Monitoring	\$ 2,360,392	26%	\$ 617,102	\$ 2,977,494
	Adaptive Management	\$ 9,766,336	27%	\$ 2,592,800	\$ 12,359,136
	Total First Cost	\$ 326,436,061		\$ 81,748,073	\$ 408,184,134

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Table I-7. First Cost – Dead Horse Bay
Hudson Raritan Estuary
Dead Horse Bay
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 35,500	30%	\$ 10,650	\$ 46,150
	Total Lands & Damages	\$ 35,500		\$ 10,650	\$ 46,150
16	Bank Stabilization	\$ 27,038,481	22%	\$ 5,948,466	\$ 32,986,947
	Total Bank Stabilization	\$ 27,038,481		\$ 5,948,466	\$ 32,986,947
18	Cultural Resource	\$ 275,000	22%	\$ 60,500	\$ 335,500
	Total Cultural Resource	\$ 275,000		\$ 60,500	\$ 335,500
30	Planning, Engineering & Design	\$ 2,195,000	22%	\$ 482,900	\$ 2,677,900
31	Construction Management	\$ 3,516,348	22%	\$ 773,597	\$ 4,289,945
Sub-Total First Cost		\$ 33,060,329		\$ 7,276,112	\$ 40,336,442
	Monitoring	\$ 105,031	22%	\$ 23,107	\$ 128,137
	Adaptive Management	\$ 234,306	22%	\$ 51,547	\$ 285,853
Total First Cost		\$ 33,399,666		\$ 7,350,767	\$ 40,750,433

Table I-8. First Cost – Fresh Creek
Hudson Raritan Estuary
Fresh Creek
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 1,616,500	30%	\$ 484,950	\$ 2,101,450
	Total Lands & Damages	\$ 1,616,500		\$ 484,950	\$ 2,101,450
16	Bank Stabilization	\$ 20,081,309	22%	\$ 4,417,888	\$ 24,499,196
	Total Bank Stabilization	\$ 20,081,309		\$ 4,417,888	\$ 24,499,196
18	Cultural Resource	\$ 325,000	22%	\$ 71,500	\$ 396,500
	Total Cultural Resource	\$ 325,000		\$ 71,500	\$ 396,500
30	Planning, Engineering & Design	\$ 2,425,000	22%	\$ 533,500	\$ 2,958,500
31	Construction Management	\$ 2,820,631	22%	\$ 620,539	\$ 3,441,170
Sub-Total First Cost		\$ 27,268,439		\$ 6,128,377	\$ 33,396,816
	Monitoring	\$ 200,513	22%	\$ 44,113	\$ 244,626
	Adaptive Management	\$ 223,823	22%	\$ 49,241	\$ 273,065
Total First Cost		\$ 27,692,776		\$ 6,221,731	\$ 33,914,507



Table I-9. First Cost – Duck Point
Hudson Raritan Estuary
Duck Point
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 13,026,095	25%	\$ 3,256,524	\$ 16,282,619
	Total Bank Stabilization	\$ 13,026,095		\$ 3,256,524	\$ 16,282,619
18	Cultural Resource	\$ 15,000	25%	\$ 3,750	\$ 18,750
	Total Cultural Resource	\$ 15,000		\$ 3,750	\$ 18,750
30	Planning, Engineering & Design	\$ 1,725,000	25%	\$ 431,250	\$ 2,156,250
31	Construction Management	\$ 1,888,610	25%	\$ 472,152	\$ 2,360,762
Sub-Total First Cost		\$ 16,672,205		\$ 4,168,926	\$ 20,841,131
	Monitoring	\$ 133,996	25%	\$ 33,498.88	\$ 167,494
	Adaptive Management	\$ 313,976	25%	\$ 78,493.98	\$ 392,470
Total First Cost		\$ 17,120,176		\$ 4,280,919	\$ 21,401,095

Table I-10. First Cost – Stony Creek
Hudson Raritan Estuary
Stony Creek
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 14,053,642	25%	\$ 3,513,411	\$ 17,567,053
	Total Bank Stabilization	\$ 14,053,642		\$ 3,513,411	\$ 17,567,053
18	Cultural Resource	\$ 15,000	25%	\$ 3,750	\$ 18,750
	Total Cultural Resource	\$ 15,000		\$ 3,750	\$ 18,750
30	Planning, Engineering & Design	\$ 1,925,000	25%	\$ 481,250	\$ 2,406,250
31	Construction Management	\$ 1,991,364	25%	\$ 497,841	\$ 2,489,205
Sub-Total First Cost		\$ 18,002,506		\$ 4,501,502	\$ 22,504,008
	Monitoring	\$ 133,996	25%	\$ 33,499	\$ 167,494
	Adaptive Management	\$ 438,832	25%	\$ 109,708	\$ 548,540
Total First Cost		\$ 18,575,334		\$ 4,644,709	\$ 23,220,043

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Table I-11 First Cost – Pumpkin Patch West
Hudson Raritan Estuary
Pumpkin Patch West
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 12,253,474	25%	\$ 3,063,369	\$ 15,316,843
	Total Bank Stabilization	\$ 12,253,474		\$ 3,063,369	\$ 15,316,843
18	Cultural Resource	\$ 15,000	25%	\$ 3,750	\$ 18,750
	Total Cultural Resource	\$ 15,000		\$ 3,750	\$ 18,750
30	Planning, Engineering & Design	\$ 1,675,000	25%	\$ 418,750	\$ 2,093,750
31	Construction Management	\$ 1,811,347	25%	\$ 452,837	\$ 2,264,184
Sub-Total First Cost		\$ 15,772,322		\$ 3,943,955	\$ 19,716,277
	Monitoring	\$ 108,310	25%	\$ 27,077	\$ 135,387
	Adaptive Management	\$ 218,136	25%	\$ 54,534	\$ 272,670
Total First Cost		\$ 16,098,767		\$ 4,025,567	\$ 20,124,334

Table I-52. First Cost – Pumpkin Patch East
Hudson Raritan Estuary
Pumpkin Patch East
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 13,289,825	25%	\$ 3,322,456	\$ 16,612,281
	Total Bank Stabilization	\$ 13,289,825		\$ 3,322,456	\$ 16,612,281
18	Cultural Resource	\$ 15,000	25%	\$ 3,750	\$ 18,750
	Total Cultural Resource	\$ 15,000		\$ 3,750	\$ 18,750
30	Planning, Engineering & Design	\$ 1,675,000	25%	\$ 418,750	\$ 2,093,750
31	Construction Management	\$ 1,914,982	25%	\$ 478,746	\$ 2,393,728
Sub-Total First Cost		\$ 16,912,307		\$ 4,228,952	\$ 21,141,259
	Monitoring	\$ 108,310	25%	\$ 27,077	\$ 135,387
	Adaptive Management	\$ 243,584	25%	\$ 60,896	\$ 304,480
Total First Cost		\$ 17,264,200		\$ 4,316,925	\$ 21,581,125



Table I-13. First Cost – Elders Center
Hudson Raritan Estuary
Elders Center
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 17,500	30%	\$ 5,250	\$ 22,750
	Total Lands & Damages	\$ 17,500		\$ 5,250	\$ 22,750
16	Bank Stabilization	\$ 11,999,629	25%	\$ 2,999,907	\$ 14,999,536
	Total Bank Stabilization	\$ 11,999,629		\$ 2,999,907	\$ 14,999,536
18	Cultural Resource	\$ 15,000	25%	\$ 3,750	\$ 18,750
	Total Cultural Resource	\$ 15,000		\$ 3,750	\$ 18,750
30	Planning, Engineering & Design	\$ 1,505,000	25%	\$ 376,250	\$ 1,881,250
31	Construction Management	\$ 1,785,963	25%	\$ 446,491	\$ 2,232,454
Sub-Total First Cost		\$ 15,323,092		\$ 3,831,648	\$ 19,154,740
	Monitoring	\$ 108,310	25%	\$ 27,077.38	\$ 135,387
	Adaptive Management	\$ 234,011	25%	\$ 58,502.81	\$ 292,514
Total First Cost		\$ 15,665,412		\$ 3,917,228	\$ 19,582,641

Table I-6. First Cost – Flushing Creek
Hudson Raritan Estuary
Flushing Creek
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 133,750	30%	\$ 40,125	\$ 173,875
	Total Lands & Damages	\$ 133,750		\$ 40,125	\$ 173,875
16	Bank Stabilization	\$ 8,512,403	23%	\$ 1,957,853	\$ 10,470,256
	Total Bank Stabilization	\$ 8,512,403		\$ 1,957,853	\$ 10,470,256
18	Cultural Resource	\$ 650,000	23%	\$ 149,500	\$ 799,500
	Total Cultural Resource	\$ 650,000		\$ 149,500	\$ 799,500
30	Planning, Engineering & Design	\$ 2,195,000	23%	\$ 504,850	\$ 2,699,850
31	Construction Management	\$ 1,462,240	23%	\$ 336,315	\$ 1,798,556
Sub-Total First Cost		\$ 12,953,393		\$ 2,988,643	\$ 15,942,036
	Monitoring	\$ 105,031	23%	\$ 24,157	\$ 129,188
	Adaptive Management	\$ 65,559	23%	\$ 15,079	\$ 80,638
Total First Cost		\$ 13,123,983		\$ 3,027,879	\$ 16,151,862

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-7. First Cost – Bronx Zoo and Dam
Hudson Raritan Estuary
Bronx Zoo and Dam
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 30,000	30%	\$ 9,000	\$ 39,000
	Total Lands & Damages	\$ 30,000		\$ 9,000	\$ 39,000
16	Bank Stabilization	\$ 5,164,184	29%	\$ 1,497,613	\$ 6,661,797
	Total Bank Stabilization	\$ 5,164,184		\$ 1,497,613	\$ 6,661,797
18	Cultural Resource	\$ 150,000	29%	\$ 43,500	\$ 193,500
	Total Cultural Resource	\$ 150,000		\$ 43,500	\$ 193,500
30	Planning, Engineering & Design	\$ 1,520,000	29%	\$ 440,800	\$ 1,960,800
31	Construction Management	\$ 972,418	29%	\$ 282,001	\$ 1,254,420
Sub-Total First Cost		\$ 7,836,602		\$ 2,272,915	\$ 10,109,517
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 556,624	29%	\$ 161,421	\$ 718,045
Total First Cost		\$ 8,521,802		\$ 2,471,623	\$ 10,993,425

Table I-8. First Cost – Stone Mill Dam
Hudson Raritan Estuary
Stone Mill Dam
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 30,000	30%	\$ 9,000	\$ 39,000
	Total Lands & Damages	\$ 30,000		\$ 9,000	\$ 39,000
16	Bank Stabilization	\$ 1,142,561	29%	\$ 331,343	\$ 1,473,903
	Total Bank Stabilization	\$ 1,142,561		\$ 331,343	\$ 1,473,903
18	Cultural Resource	\$ 250,000	29%	\$ 72,500	\$ 322,500
	Total Cultural Resource	\$ 250,000		\$ 72,500	\$ 322,500
30	Planning, Engineering & Design	\$ 1,260,000	29%	\$ 365,400	\$ 1,625,400
31	Construction Management	\$ 748,000	29%	\$ 216,920	\$ 964,920
Sub-Total First Cost		\$ 3,430,561		\$ 995,163	\$ 4,425,723
	Monitoring	\$ 81,160	29%	\$ 23,536	\$ 104,696
	Adaptive Management	\$ 99,404	29%	\$ 28,827	\$ 128,231
Total First Cost		\$ 3,611,124		\$ 1,047,526	\$ 4,658,650



Table I-9. First Cost – Shoelace Park
Hudson Raritan Estuary
Shoelace Park
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 45,000	30%	\$ 13,500	\$ 58,500
	Total Lands & Damages	\$ 45,000		\$ 13,500	\$ 58,500
16	Bank Stabilization	\$ 11,154,662	29%	\$ 3,234,852	\$ 14,389,514
	Total Bank Stabilization	\$ 11,154,662		\$ 3,234,852	\$ 14,389,514
18	Cultural Resource	\$ 200,000	29%	\$ 58,000	\$ 258,000
	Total Cultural Resource	\$ 200,000		\$ 58,000	\$ 258,000
30	Planning, Engineering & Design	\$ 2,370,000	29%	\$ 687,300	\$ 3,057,300
31	Construction Management	\$ 1,510,466	29%	\$ 438,035	\$ 1,948,501
Sub-Total First Cost		\$ 15,280,128		\$ 4,431,687	\$ 19,711,816
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 647,577	29%	\$ 187,797	\$ 835,374
Total First Cost		\$ 16,056,282		\$ 4,656,772	\$ 20,713,053

Table I-10. First Cost – Bronxville Lake
Hudson Raritan Estuary
Bronxville Lake
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 75,000	30%	\$ 22,500	\$ 97,500
	Total Lands & Damages	\$ 75,000		\$ 22,500	\$ 97,500
16	Bank Stabilization	\$ 7,447,979	29%	\$ 2,159,914	\$ 9,607,892
	Total Bank Stabilization	\$ 7,447,979		\$ 2,159,914	\$ 9,607,892
18	Cultural Resource	\$ 250,000	29%	\$ 72,500	\$ 322,500
	Total Cultural Resource	\$ 250,000		\$ 72,500	\$ 322,500
30	Planning, Engineering & Design	\$ 2,140,000	29%	\$ 620,600	\$ 2,760,600
31	Construction Management	\$ 1,226,798	29%	\$ 355,771	\$ 1,582,569
Sub-Total First Cost		\$ 11,139,776		\$ 3,231,285	\$ 14,371,062
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 669,065	29%	\$ 194,029	\$ 863,094
Total First Cost		\$ 11,937,417		\$ 3,462,601	\$ 15,400,018

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Table I-11. First Cost – Garth Woods / Harney Road
Hudson Raritan Estuary
Garth Wood-Harney Road
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 60,000	30%	\$ 18,000	\$ 78,000
	Total Lands & Damages	\$ 60,000		\$ 18,000	\$ 78,000
16	Bank Stabilization	\$ 4,389,235	29%	\$ 1,272,878	\$ 5,662,113
	Total Bank Stabilization	\$ 4,389,235		\$ 1,272,878	\$ 5,662,113
18	Cultural Resource	\$ 250,000	29%	\$ 72,500	\$ 322,500
	Total Cultural Resource	\$ 250,000		\$ 72,500	\$ 322,500
30	Planning, Engineering & Design	\$ 1,760,000	29%	\$ 510,400	\$ 2,270,400
31	Construction Management	\$ 838,923	29%	\$ 243,288	\$ 1,082,211
Sub-Total First Cost		\$ 7,298,158		\$ 2,117,066	\$ 9,415,224
	Monitoring	\$ 128,576	29%	\$ 37,287	\$ 165,863
	Adaptive Management	\$ 574,754	29%	\$ 166,679	\$ 741,432
Total First Cost		\$ 8,001,488		\$ 2,321,032	\$ 10,322,520

Table I-20. First Cost – Oak Island Yards
Hudson Raritan Estuary
Oak Island Yards
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 2,730,000	30%	\$ 819,000	\$ 3,549,000
	Total Lands & Damages	\$ 2,730,000		\$ 819,000	\$ 3,549,000
16	Bank Stabilization	\$ 6,315,339	25%	\$ 1,578,835	\$ 7,894,173
	Total Bank Stabilization	\$ 6,315,339		\$ 1,578,835	\$ 7,894,173
18	Cultural Resource	\$ 75,000	25%	\$ 18,750	\$ 93,750
	Total Cultural Resource	\$ 75,000		\$ 18,750	\$ 93,750
30	Planning, Engineering & Design	\$ 1,740,000	25%	\$ 435,000	\$ 2,175,000
31	Construction Management	\$ 1,220,034	25%	\$ 305,008	\$ 1,525,042
Sub-Total First Cost		\$ 12,080,372		\$ 3,156,593	\$ 15,236,965
	Monitoring	\$ 80,835	25%	\$ 20,209	\$ 101,044
	Adaptive Management	\$ 82,208	25%	\$ 20,552	\$ 102,760
Total First Cost		\$ 12,243,415		\$ 3,197,354	\$ 15,440,769



Table I-12. First Cost – Essex County Branch Brook Park
Hudson Raritan Estuary
Essex County Branch Brook Park
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 75,000	30%	\$ 22,500	\$ 97,500
	Total Lands & Damages	\$ 75,000		\$ 22,500	\$ 97,500
16	Bank Stabilization	\$ 31,720,092	25%	\$ 7,930,023	\$ 39,650,114
	Total Bank Stabilization	\$ 31,720,092		\$ 7,930,023	\$ 39,650,114
18	Cultural Resource	\$ 200,000	25%	\$ 50,000	\$ 250,000
	Total Cultural Resource	\$ 200,000		\$ 50,000	\$ 250,000
30	Planning, Engineering & Design	\$ 2,290,000	25%	\$ 572,500	\$ 2,862,500
31	Construction Management	\$ 3,992,009	25%	\$ 998,002	\$ 4,990,011
Sub-Total First Cost		\$ 38,277,101		\$ 9,573,025	\$ 47,850,126
	Monitoring	\$ 152,772	25%	\$ 38,193	\$ 190,965
	Adaptive Management	\$ 3,189,258	25%	\$ 797,315	\$ 3,986,573
Total First Cost		\$ 41,619,131		\$ 10,408,533	\$ 52,027,663

Table I-13. First Cost – Metromedia Tract
Hudson Raritan Estuary
Metromedia
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 490,500	35%	\$ 171,675	\$ 662,175
	Total Lands & Damages	\$ 490,500		\$ 171,675	\$ 662,175
16	Bank Stabilization	\$ 19,610,145	21%	\$ 4,118,130	\$ 23,728,275
	Total Bank Stabilization	\$ 19,610,145		\$ 4,118,130	\$ 23,728,275
18	Cultural Resource	\$ 50,000	21%	\$ 10,500	\$ 60,500
	Total Cultural Resource	\$ 50,000		\$ 10,500	\$ 60,500
30	Planning, Engineering & Design	\$ 1,875,000	21%	\$ 393,750	\$ 2,268,750
31	Construction Management	\$ 2,761,014	21%	\$ 579,813	\$ 3,340,828
Sub-Total First Cost		\$ 24,786,659		\$ 5,273,868	\$ 30,060,528
	Monitoring	\$ 152,772	21%	\$ 32,082	\$ 184,854
	Adaptive Management	\$ 711,321	21%	\$ 149,377	\$ 860,698
Total First Cost		\$ 25,650,752		\$ 5,455,328	\$ 31,106,080

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study
Final Integrated Feasibility Report & Environmental Assessment

Table I-14. First Cost – Meadowlark Marsh
Hudson Raritan Estuary
Meadowlark Marsh
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 781,200	35%	\$ 273,420	\$ 1,054,620
	Total Lands & Damages	\$ 781,200		\$ 273,420	\$ 1,054,620
16	Bank Stabilization	\$ 17,958,881	21%	\$ 3,771,365	\$ 21,730,246
	Total Bank Stabilization	\$ 17,958,881		\$ 3,771,365	\$ 21,730,246
18	Cultural Resource	\$ 225,000	21%	\$ 47,250	\$ 272,250
	Total Cultural Resource	\$ 225,000		\$ 47,250	\$ 272,250
30	Planning, Engineering & Design	\$ 2,335,000	21%	\$ 490,350	\$ 2,825,350
31	Construction Management	\$ 2,608,388	21%	\$ 547,761	\$ 3,156,150
Sub-Total First Cost		\$ 23,908,469		\$ 5,130,146	\$ 29,038,615
	Monitoring	\$ 152,772	21%	\$ 32,082	\$ 184,854
	Adaptive Management	\$ 367,752	21%	\$ 77,228	\$ 444,980
Total First Cost		\$ 24,428,993		\$ 5,239,456	\$ 29,668,449

Table I-15. First Cost – Naval Weapons Station Earle
Hudson Raritan Estuary
Naval Weapons Station Earle
October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 15,000	30%	\$ 4,500	\$ 19,500
	Total Lands & Damages	\$ 15,000		\$ 4,500	\$ 19,500
06	Fish and Wildlife Facilities	\$ 3,814,084	37%	\$ 1,411,211	\$ 5,225,295
	Total Fish and Wildlife Facilities	\$ 3,814,084		\$ 1,411,211	\$ 5,225,295
18	Cultural Resource	\$ 125,000	37%	\$ 46,250	\$ 171,250
	Total Cultural Resource	\$ 125,000		\$ 46,250	\$ 171,250
30	Planning, Engineering & Design	\$ 1,205,000	37%	\$ 445,850	\$ 1,650,850
31	Construction Management	\$ 722,908	37%	\$ 267,476	\$ 990,385
Total First Cost		\$ 5,881,993		\$ 2,175,287	\$ 8,057,280
	Monitoring	\$ 57,137	37%	\$ 21,141	\$ 78,278
	Adaptive Management	\$ 272,096	37%	\$ 100,675	\$ 372,771
Total First Cost		\$ 6,211,225		\$ 2,297,103	\$ 8,508,329



Table I-16. First Cost – Bush Terminal
Hudson Raritan Estuary
Bush Terminal
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 45,000	30%	\$ 13,500	\$ 58,500
	Total Lands & Damages	\$ 45,000		\$ 13,500	\$ 58,500
06	Fish and Wildlife Facilities	\$ 2,464,023	37%	\$ 911,689	\$ 3,375,712
	Total Fish and Wildlife Facilities	\$ 2,464,023		\$ 911,689	\$ 3,375,712
18	Cultural Resource	\$ 125,000	37%	\$ 46,250	\$ 171,250
	Total Cultural Resource	\$ 125,000		\$ 46,250	\$ 171,250
30	Planning, Engineering & Design	\$ 1,355,000	37%	\$ 501,350	\$ 1,856,350
31	Construction Management	\$ 626,000	37%	\$ 231,620	\$ 857,620
Sub-Total First Cost		\$ 4,615,023		\$ 1,704,409	\$ 6,319,432
	Monitoring	\$ 108,009	37%	\$ 39,963	\$ 147,972
	Adapative Management	\$ 341,666	37%	\$ 126,416	\$ 468,082
Total First Cost		\$ 5,064,698		\$ 1,870,788	\$ 6,935,486

Table I-17. First Cost – Head of Jamaica Bay
Hudson Raritan Estuary
Head of Jamaica Bay
 October 2019 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 15,000	30%	\$ 4,500	\$ 19,500
	Total Lands & Damages	\$ 15,000		\$ 4,500	\$ 19,500
06	Fish and Wildlife Facilities	\$ 2,056,724	37%	\$ 760,988	\$ 2,817,712
	Total Fish and Wildlife Facilities	\$ 2,056,724		\$ 760,988	\$ 2,817,712
18	Cultural Resource	\$ 125,000	37%	\$ 46,250	\$ 171,250
	Total Cultural Resource	\$ 125,000		\$ 46,250	\$ 171,250
30	Planning, Engineering & Design	\$ 1,205,000	37%	\$ 445,850	\$ 1,650,850
31	Construction Management	\$ 408,172	37%	\$ 151,024	\$ 559,196
Sub-Total First Cost		\$ 3,809,896		\$ 1,408,612	\$ 5,218,508
	Monitoring	\$ 57,137	37%	\$ 21,141	\$ 78,278
	Adapative Management	\$ 282,384	37%	\$ 104,482	\$ 386,866
Total First Cost		\$ 4,149,417		\$ 1,534,234	\$ 5,683,652

3. Construction Schedule and Windows

The construction duration for the entire HRE recommendation was estimated at 13.5 years, as shown in Figure I-27. The construction schedule for each one of the 20 ecosystem restoration sites was developed based on the crew outputs referenced from RSMeans with the assumption that multiple crews would work simultaneously.

The construction start year for each site are phased based on the HRE construction schedule budget, phased into seven (7) different groupings. The seven (7) groupings are show in Table I-28. The phasing for the construction activities have been developed in coordination with the non-federal sponsors based on sponsor readiness and priorities; as well as implementing restoration with geographic distribution among the planning regions.

3.1. July Mobilization

Project sites that are to perform mobilization in July in order to meet the Phragmites spraying window of between 15 August to 15 October are as follow:

- Dead Horse Bay
- Fresh Creek
- Flushing Creek
- Oak Island Yards
- Metromedia Tract
- Meadowlark Marsh

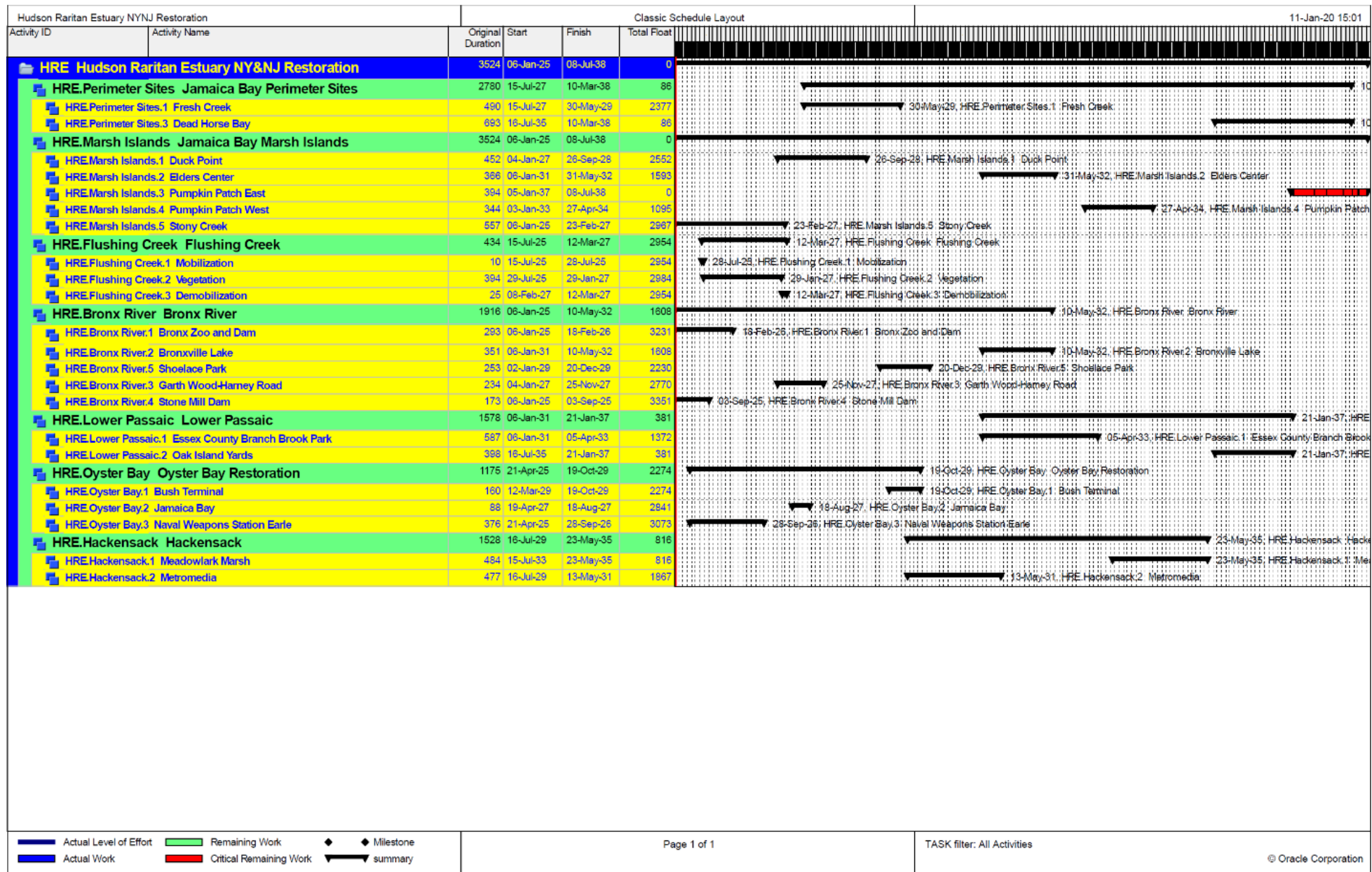
3.2. January Mobilization

Project sites that are to perform mobilization in January due to Earthwork/Placement requirement prior to planting are as follow:

- Duck Point
- Stony Creek
- Pumpkin Patch West
- Pumpkin Patch East
- Elders Center
- Bronx Zoo and Dam
- Stone Mill Dam
- Shoelace Park
- Bronxville Lake
- Garth Wood-Harney Road
- Essex County Branch Brook Park

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-18. HRE Construction Schedule



**Table I-19. HRE Construction Schedule Budget**

Sites	Grouping 1 Construction: 2025-27	Grouping 2 Construction: 2027-29	Grouping 3 Construction: 2029-31	Grouping 4 Construction: 2031-33	Grouping 5 Construction: 2033-35	Grouping 6 Construction: 2035-37	Grouping 7 Construction: 2037-39
Jamaica Bay Planning Region - Perimeter Sites							
Fresh Creek		July 2027					
Dead Horse Bay						July 2035	
Jamaica Bay Planning Region - Marsh Islands							
Elders Center				January 2031			
Duck Point		January 2027					
Pumpkin Patch East							January 2037
Pumpkin Patch West					January 2033		
Stony Creek	January 2025						
Flushing Creek							
Flushing Creek	July 2025						
Bronx River							
Bronx Zoo and Dam	January 2025						
Stone Mill Dam	January 2025						
Shoelace Park			January 2029				
Bronxville Lake				January 2031			
Garth Woods - Harney Road		January 2027					
Hackensack							
Meadowlark Marsh					July 2033		
Metromedia Tract			July 2029				
Lower Passaic							
Essex County Branch Brook Park				January 2031			
Oak Island Yards						July 2035	
Oyster Bay Restoration							
Jamaica Bay - Head of Bay		April 2027					
Bush Terminal			March 2029				
Naval Weapons Station Earle	April 2025						

3.3. March/April Mobilization

Project sites that are to perform mobilization around March / April timeframe in order to meet the actual installation window between May to July are as follow:

- Naval Weapons Station Earle
- Bush Terminal
- Head of Jamaica Bay

3.4. Planting Windows

The general planting windows for the 20 ecosystem restoration sites are as follow:

- 01 March to 01 May – Spring Deciduous Woody Plants
- 01 April to 15 May – Spring Evergreen Woody Plants
- 15 May to 30 June – Herbaceous Plants
- 30 June to 15 September – No Planting
- 15 September to 01 December – Fall Deciduous Woody Plants
- 15 September to 15 October – Fall Evergreen Woody Plants

4. Cost Summary

The Recommended Plan has an estimated project first cost of \$408,184,000 which includes monitoring costs of \$2,977,000 and adaptive management costs of \$12,359,000 (October 2019/FY2020 price level). The Total Fully Funded Project cost is \$567,047,000 excluding the Monitoring and Adaptive Management cost of \$3,955,000 and \$16,659,000 respectively (for a total of \$587,661,000). The fully funded total project cost for the entire HRE Recommended Plan is presented in Table I-28. The costs for each ecosystem restoration project site is presented in Table I-29 thru Table I-48.

April 2020



Table I-20. Total Project Cost Summary

PROJECT: Hudson Raritan Estuary
PROJECT NO: P2 108384
LOCATION: New York / New Jersey

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

This Estimate reflects the scope and schedule in report; Draft Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date:				Spent Thru: 1-Oct-19 (\$K)	TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J						
06	FISH & WILDLIFE FACILITIES	\$8,335	\$3,084	37.0%	\$11,419	0.0%	\$8,335	\$3,084	\$11,419	\$0	\$11,419	25.6%	\$10,465	\$3,872	\$14,338
16	BANK STABILIZATION	\$225,158	\$54,375	24.1%	\$279,533	0.0%	\$225,158	\$54,375	\$279,533	\$0	\$279,533	43.0%	\$322,052	\$77,546	\$399,598
18	CULTURAL RESOURCE PRESERVATION	\$3,350	\$885	26.4%	\$4,235	0.0%	\$3,350	\$885	\$4,235	\$0	\$4,235	32.2%	\$4,435	\$1,164	\$5,599
CONSTRUCTION ESTIMATE TOTALS:		\$236,843	\$58,343		\$295,186	0.0%	\$236,843	\$58,343	\$295,186	\$0	\$295,186	42.1%	\$336,952	\$82,582	\$419,535
01	LANDS AND DAMAGES	\$6,265	\$1,943	31.0%	\$8,208	0.0%	\$6,265	\$1,943	\$8,208	\$0	\$8,208	44.8%	\$9,074	\$2,814	\$11,888
30	PLANNING, ENGINEERING & DESIGN	\$36,375	\$9,557	26.3%	\$45,932	0.0%	\$36,375	\$9,557	\$45,932	\$0	\$45,932	47.2%	\$53,663	\$13,970	\$67,633
31	CONSTRUCTION MANAGEMENT	\$34,827	\$8,695	25.0%	\$43,522	0.0%	\$34,827	\$8,695	\$43,522	\$0	\$43,522	56.2%	\$54,495	\$13,497	\$67,992
PROJECT COST SUB-TOTALS:		\$314,309	\$78,538	25.0%	\$392,848		\$314,309	\$78,538	\$392,848	\$0	\$392,848	44.3%	\$454,184	\$112,863	\$567,047
MONITORING		\$2,360	\$617	26.1%	\$2,977	0.0%	\$2,360	\$617	\$2,977	\$0	\$2,977	32.8%	\$3,137	\$818	\$3,955
ADAPATIVE MANAGEMENT		\$9,766	\$2,593	26.5%	\$12,359	0.0%	\$9,766	\$2,593	\$12,359	\$0	\$12,359	34.8%	\$13,176	\$3,483	\$16,659
PROJECT COST TOTALS:		\$326,436	\$81,748		\$408,184		\$326,436	\$81,748	\$408,184		\$408,184		\$470,496	\$117,164	\$587,661

CHIEF, COST ENGINEERING, Mukesh Kumar

PROJECT MANAGER, Lisa Baron

CHIEF, REAL ESTATE, Lydia Williams

ESTIMATED TOTAL PROJECT COST: \$567,047

ESTIMATED TOTAL MONITORING COST: \$3,955

ESTIMATED TOTAL ADAPTIVE MANAGEMENT COST: \$16,659

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-30. Total Project Cost Summary – Dead Horse Bay

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Dead Horse Bay													
16	BANK STABILIZATION	\$27,038	\$5,948	22.0%	\$32,987	0.0%	\$27,038	\$5,948	\$32,987	2036Q4	64.4%	\$44,464	\$9,782	\$54,246
18	CULTURAL RESOURCE PRESERVATION	\$275	\$61	22.0%	\$336	0.0%	\$275	\$61	\$336	2036Q4	64.4%	\$445	\$98	\$543
	(a)1 PED Activities	\$150	\$33	22.0%	\$183	0.0%	\$150	\$33	\$183	2035Q4	59.7%	\$239	\$53	\$292
	(a2) Construction Activities	\$25	\$6	22.0%	\$31	0.0%	\$25	\$6	\$31	2036Q4	64.4%	\$41	\$9	\$50
	(b) Mitigation with Data Recovery	\$100	\$22	22.0%	\$122	0.0%	\$100	\$22	\$122	2036Q4	64.4%	\$164	\$36	\$201
	CONSTRUCTION ESTIMATE TOTALS:	\$27,313	\$6,009	22.0%	\$33,322		\$27,313	\$6,009	\$33,322			\$44,909	\$9,880	\$54,789
01	LANDS AND DAMAGES	\$36	\$11	30.0%	\$46	0.0%	\$36	\$11	\$46	2035Q4	59.7%	\$57	\$17	\$74
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2035Q4	83.4%	\$734	\$161	\$895
	Planning & Environmental Compliance	\$515	\$113	22.0%	\$628	0.0%	\$515	\$113	\$628	2035Q4	83.4%	\$944	\$208	\$1,152
	Engineering & Design	\$1,080	\$238	22.0%	\$1,318	0.0%	\$1,080	\$238	\$1,318	2035Q4	83.4%	\$1,981	\$436	\$2,416
	Reviews, ATRs, IEPRs, VE	\$150	\$33	22.0%	\$183	0.0%	\$150	\$33	\$183	2035Q4	83.4%	\$275	\$61	\$336
	Contracting & Reprographics	\$50	\$11	22.0%	\$61	0.0%	\$50	\$11	\$61	2035Q4	83.4%	\$92	\$20	\$112
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,716.35	\$598	22.0%	\$3,314	0.0%	\$2,716	\$598	\$3,314	2036Q4	90.9%	\$5,186	\$1,141	\$6,327
	Engineering During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2036Q4	90.9%	\$382	\$84	\$466
	Planning During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2036Q4	90.9%	\$382	\$84	\$466
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2036Q4	90.9%	\$764	\$168	\$932
	CONTRACT COST SUB-TOTALS:	\$33,060	\$7,276		\$40,336		\$33,060	\$7,276	\$40,336			\$55,704	\$12,260	\$67,964
	Monitoring	\$105	\$23	22.0%	\$128	0.0%	\$105	\$23	\$128	2036Q4	64.4%	\$173	\$38	\$211
	Adaptive Management	\$234	\$52	22.0%	\$286	0.0%	\$234	\$52	\$286	2036Q4	64.4%	\$385	\$85	\$470
	CONTRACT COST TOTALS:	\$33,400	\$7,351		\$40,750		\$33,400	\$7,351	\$40,750			\$56,263	\$12,382	\$68,645



Table I-21. Total Project Cost Summary – Fresh Creek

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Fresh Creek													
16	BANK STABILIZATION	\$20,081	\$4,418	22.0%	\$24,499	0.0%	\$20,081	\$4,418	\$24,499	2028Q4	29.8%	\$26,069	\$5,735	\$31,804
18	CULTURAL RESOURCE PRESERVATION	\$325	\$72	22.0%	\$397	0.0%	\$325	\$72	\$397	2028Q4	29.8%	\$414	\$91	\$505
	(a) 1 PED Activities	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2027Q4	26.0%	\$252	\$55	\$308
	(a2) Construction Activities	\$50	\$11	22.0%	\$61	0.0%	\$50	\$11	\$61	2028Q4	29.8%	\$65	\$14	\$79
	(b) Mitigation with Data Recovery	\$75	\$17	22.0%	\$92	0.0%	\$75	\$17	\$92	2028Q4	29.8%	\$97	\$21	\$119
	CONSTRUCTION ESTIMATE TOTALS:	\$20,406	\$4,489	22.0%	\$24,896		\$20,406	\$4,489	\$24,896			\$26,483	\$5,826	\$32,309
01	LANDS AND DAMAGES	\$1,617	\$485	30.0%	\$2,101	0.0%	\$1,617	\$485	\$2,101	2027Q4	26.0%	\$2,037	\$611	\$2,649
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2027Q4	33.9%	\$536	\$118	\$653
	Planning & Environmental Compliance	\$515	\$113	22.0%	\$628	0.0%	\$515	\$113	\$628	2027Q4	33.9%	\$689	\$152	\$841
	Engineering & Design	\$1,310	\$288	22.0%	\$1,598	0.0%	\$1,310	\$288	\$1,598	2027Q4	33.9%	\$1,754	\$386	\$2,140
	Reviews, ATRs, IEPRs, VE	\$150	\$33	22.0%	\$183	0.0%	\$150	\$33	\$183	2027Q4	33.9%	\$201	\$44	\$245
	Contracting & Reprographics	\$50	\$11	22.0%	\$61	0.0%	\$50	\$11	\$61	2027Q4	33.9%	\$67	\$15	\$82
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,020.63	\$445	22.0%	\$2,465	0.0%	\$2,021	\$445	\$2,465	2028Q4	39.1%	\$2,811	\$618	\$3,429
	Engineering During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2028Q4	39.1%	\$278	\$61	\$339
	Planning During Construction	\$200	\$44	22.0%	\$244	0.0%	\$200	\$44	\$244	2028Q4	39.1%	\$278	\$61	\$339
	Project Management	\$400	\$88	22.0%	\$488	0.0%	\$400	\$88	\$488	2028Q4	39.1%	\$556	\$122	\$679
	CONTRACT COST SUB-TOTALS:	\$27,268	\$6,128		\$33,397		\$27,268	\$6,128	\$33,397			\$35,690	\$8,015	\$43,705
	Monitoring	\$201	\$44	22.0%	\$245	0.0%	\$201	\$44	\$245	2028Q4	29.8%	\$260	\$57	\$318
	Adaptive Management	\$224	\$49	22.0%	\$273	0.0%	\$224	\$49	\$273	2028Q4	29.8%	\$291	\$64	\$354
	CONTRACT COST TOTALS:	\$27,693	\$6,222		\$33,915		\$27,693	\$6,222	\$33,915			\$36,241	\$8,136	\$44,377

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-22. Total Project Cost Summary – Duck Point

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
Duck Point														
16	BANK STABILIZATION	\$13,026	\$3,257	25.0%	\$16,283	0.0%	\$13,026	\$3,257	\$16,283	2027Q4	26.0%	\$16,417	\$4,104	\$20,522
18	CULTURAL RESOURCE PRESERVATION	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2027Q4	26.0%	\$19	\$5	\$23
	(a) 1 PED Activities	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2027Q2	24.2%	\$19	\$5	\$23
	(a2) Construction Activities	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(b) Mitigation with Data Recovery	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$13,041	\$3,260	25.0%	\$16,301		\$13,041	\$3,260	\$16,301			\$16,436	\$4,109	\$20,545
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2027Q2	24.2%	\$22	\$7	\$28
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2027Q2	31.3%	\$525	\$131	\$657
	Planning & Environmental Compliance	\$215	\$54	25.0%	\$269	0.0%	\$215	\$54	\$269	2027Q2	31.3%	\$282	\$71	\$353
	Engineering & Design	\$940	\$235	25.0%	\$1,175	0.0%	\$940	\$235	\$1,175	2027Q2	31.3%	\$1,234	\$309	\$1,543
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2027Q2	31.3%	\$158	\$39	\$197
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2027Q2	31.3%	\$66	\$16	\$82
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,302.61	\$326	25.0%	\$1,628	0.0%	\$1,303	\$326	\$1,628	2027Q4	33.9%	\$1,744	\$436	\$2,180
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2027Q4	33.9%	\$182	\$46	\$228
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2027Q4	33.9%	\$201	\$50	\$251
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2027Q4	33.9%	\$402	\$100	\$502
CONTRACT COST SUB-TOTALS:		\$16,672	\$4,169		\$20,841		\$16,672	\$4,169	\$20,841			\$21,251	\$5,314	\$26,565
	Monitoring	\$134	\$33	25.0%	\$167	0.0%	\$134	\$33	\$167	2027Q4	26.0%	\$169	\$42	\$211
	Adaptive Management	\$314	\$78	25.0%	\$392	0.0%	\$314	\$78	\$392	2027Q4	26.0%	\$396	\$99	\$495
CONTRACT COST TOTALS:		\$17,120	\$4,281		\$21,401		\$17,120	\$4,281	\$21,401			\$21,816	\$5,455	\$27,271

April 2020



Table I-23. Total Project Cost Summary – Stony Creek

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Stony Creek													
16	BANK STABILIZATION	\$14,054	\$3,513	25.0%	\$17,567	0.0%	\$14,054	\$3,513	\$17,567	2026Q1	19.6%	\$16,814	\$4,203	\$21,017
18	CULTURAL RESOURCE PRESERVATION	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2026Q1	19.6%	\$18	\$4	\$22
	(a)1 PED Activities	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2025Q2	17.0%	\$18	\$4	\$22
	(a2) Construction Activities	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(b) Mitigation with Data Recovery	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$14,069	\$3,517	25.0%	\$17,586		\$14,069	\$3,517	\$17,586			\$16,832	\$4,208	\$21,039
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2025Q2	17.0%	\$20	\$6	\$27
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2025Q2	21.9%	\$488	\$122	\$609
	Planning & Environmental Compliance	\$215	\$54	25.0%	\$269	0.0%	\$215	\$54	\$269	2025Q2	21.9%	\$262	\$66	\$328
	Engineering & Design	\$1,140	\$285	25.0%	\$1,425	0.0%	\$1,140	\$285	\$1,425	2025Q2	21.9%	\$1,389	\$347	\$1,737
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2025Q2	21.9%	\$146	\$37	\$183
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2025Q2	21.9%	\$61	\$15	\$76
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,405.36	\$351	25.0%	\$1,757	0.0%	\$1,405	\$351	\$1,757	2026Q1	25.3%	\$1,762	\$440	\$2,202
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2026Q1	25.3%	\$170	\$43	\$213
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2026Q1	25.3%	\$188	\$47	\$235
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2026Q1	25.3%	\$376	\$94	\$470
	CONTRACT COST SUB-TOTALS:	\$18,003	\$4,502		\$22,504		\$18,003	\$4,502	\$22,504			\$21,694	\$5,425	\$27,119
	Monitoring	\$134	\$33	25.0%	\$167	0.0%	\$134	\$33	\$167	2026Q1	19.6%	\$160	\$40	\$200
	Adaptive Management	\$439	\$110	25.0%	\$549	0.0%	\$439	\$110	\$549	2026Q1	19.6%	\$525	\$131	\$656
	CONTRACT COST TOTALS:	\$18,575	\$4,645		\$23,220		\$18,575	\$4,645	\$23,220			\$22,380	\$5,596	\$27,976

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-24. Total Project Cost Summary – Pumpkin Patch West

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Pumpkin Patch West													
16	BANK STABILIZATION	\$12,253	\$3,063	25.0%	\$15,317	0.0%	\$12,253	\$3,063	\$15,317	2034Q4	55.0%	\$18,994	\$4,748	\$23,742
18	CULTURAL RESOURCE PRESERVATION	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2034Q4	55.0%	\$22	\$6	\$28
	(a) 1 PED Activities	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2033Q2	48.3%	\$22	\$6	\$28
	(a2) Construction Activities	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(b) Mitigation with Data Recovery	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$12,268	\$3,067	25.0%	\$15,336		\$12,268	\$3,067	\$15,336			\$19,016	\$4,754	\$23,770
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2033Q2	48.3%	\$26	\$8	\$34
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2033Q2	65.8%	\$663	\$166	\$829
	Planning & Environmental Compliance	\$215	\$54	25.0%	\$269	0.0%	\$215	\$54	\$269	2033Q2	65.8%	\$357	\$89	\$446
	Engineering & Design	\$890	\$223	25.0%	\$1,113	0.0%	\$890	\$223	\$1,113	2033Q2	65.8%	\$1,476	\$369	\$1,845
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2033Q2	65.8%	\$199	\$50	\$249
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2033Q2	65.8%	\$83	\$21	\$104
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,225.35	\$306	25.0%	\$1,532	0.0%	\$1,225	\$306	\$1,532	2034Q4	76.2%	\$2,159	\$540	\$2,698
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2034Q4	76.2%	\$240	\$60	\$299
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2034Q4	76.2%	\$264	\$66	\$330
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2034Q4	76.2%	\$529	\$132	\$661
	CONTRACT COST SUB-TOTALS:	\$15,772	\$3,944		\$19,716		\$15,772	\$3,944	\$19,716			\$25,011	\$6,254	\$31,265
	Monitoring	\$108	\$27	25.0%	\$135	0.0%	\$108	\$27	\$135	2034Q4	55.0%	\$168	\$42	\$210
	Adaptive Management	\$218	\$55	25.0%	\$273	0.0%	\$218	\$55	\$273	2034Q4	55.0%	\$338	\$85	\$423
	CONTRACT COST TOTALS:	\$16,099	\$4,026		\$20,124		\$16,099	\$4,026	\$20,124			\$25,517	\$6,380	\$31,897



Table I-25. Total Project Cost Summary – Pumpkin Patch East

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 19-Nov-19 Effective Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Pumpkin Patch East													
16	BANK STABILIZATION	\$13,290	\$3,322	25.0%	\$16,612	0.0%	\$13,290	\$3,322	\$16,612	2038Q4	74.5%	\$23,186	\$5,796	\$28,982
18	CULTURAL RESOURCE PRESERVATION	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2038Q4	74.5%	\$25	\$6	\$31
	(a) 1 PED Activities	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2037Q2	66.9%	\$25	\$6	\$31
	(a2) Construction Activities	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(b) Mitigation with Data Recovery	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$13,305	\$3,326	25.0%	\$16,631		\$13,305	\$3,326	\$16,631			\$23,211	\$5,803	\$29,013
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2037Q2	66.9%	\$29	\$9	\$38
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2037Q2	94.8%	\$779	\$195	\$974
	Planning & Environmental Compliance	\$215	\$54	25.0%	\$269	0.0%	\$215	\$54	\$269	2037Q2	94.8%	\$419	\$105	\$523
	Engineering & Design	\$890	\$223	25.0%	\$1,113	0.0%	\$890	\$223	\$1,113	2037Q2	94.8%	\$1,733	\$433	\$2,167
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2037Q2	94.8%	\$234	\$58	\$292
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2037Q2	94.8%	\$97	\$24	\$122
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,328.98	\$332	25.0%	\$1,661	0.0%	\$1,329	\$332	\$1,661	2038Q4	107.2%	\$2,754	\$688	\$3,442
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2038Q4	107.2%	\$282	\$70	\$352
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2038Q4	107.2%	\$311	\$78	\$388
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2038Q4	107.2%	\$622	\$155	\$777
	CONTRACT COST SUB-TOTALS:	\$16,912	\$4,229		\$21,141		\$16,912	\$4,229	\$21,141			\$30,470	\$7,619	\$38,089
	Monitoring	\$108	\$27	25.0%	\$135	0.0%	\$108	\$27	\$135	2038Q4	74.5%	\$189	\$47	\$236
	Adaptive Management	\$244	\$61	25.0%	\$304	0.0%	\$244	\$61	\$304	2038Q4	74.5%	\$425	\$106	\$531
	CONTRACT COST TOTALS:	\$17,264	\$4,317		\$21,581		\$17,264	\$4,317	\$21,581			\$31,084	\$7,772	\$38,856

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-26. Total Project Cost Summary – Elders Center

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Elders Center													
16	BANK STABILIZATION	\$12,000	\$3,000	25.0%	\$15,000	0.0%	\$12,000	\$3,000	\$15,000	2031Q4	41.9%	\$17,022	\$4,255	\$21,277
18	CULTURAL RESOURCE PRESERVATION	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2031Q4	41.9%	\$21	\$5	\$26
	(a) 1 PED Activities	\$15	\$4	25.0%	\$19	0.0%	\$15	\$4	\$19	2031Q2	39.7%	\$21	\$5	\$26
	(a2) Construction Activities	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(b) Mitigation with Data Recovery	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$12,015	\$3,004	25.0%	\$15,018		\$12,015	\$3,004	\$15,018			\$17,043	\$4,261	\$21,304
01	LANDS AND DAMAGES	\$18	\$5	30.0%	\$23	0.0%	\$18	\$5	\$23	2031Q2	39.7%	\$24	\$7	\$32
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2031Q2	53.3%	\$613	\$153	\$767
	Planning & Environmental Compliance	\$215	\$54	25.0%	\$269	0.0%	\$215	\$54	\$269	2031Q2	53.3%	\$330	\$82	\$412
	Engineering & Design	\$720	\$180	25.0%	\$900	0.0%	\$720	\$180	\$900	2031Q2	53.3%	\$1,104	\$276	\$1,380
	Reviews, ATRs, IEPRs, VE	\$120	\$30	25.0%	\$150	0.0%	\$120	\$30	\$150	2031Q2	53.3%	\$184	\$46	\$230
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2031Q2	53.3%	\$77	\$19	\$96
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,199.96	\$300	25.0%	\$1,500	0.0%	\$1,200	\$300	\$1,500	2031Q4	56.4%	\$1,877	\$469	\$2,346
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2031Q4	56.4%	\$213	\$53	\$266
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2031Q4	56.4%	\$235	\$59	\$293
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2031Q4	56.4%	\$469	\$117	\$586
	CONTRACT COST SUB-TOTALS:	\$15,323	\$3,832		\$19,155		\$15,323	\$3,832	\$19,155			\$22,168	\$5,543	\$27,711
	Monitoring	\$108	\$27	25.0%	\$135	0.0%	\$108	\$27	\$135	2031Q4	41.9%	\$154	\$38	\$192
	Adaptive Management	\$234	\$59	25.0%	\$293	0.0%	\$234	\$59	\$293	2031Q4	41.9%	\$332	\$83	\$415
	CONTRACT COST TOTALS:	\$15,665	\$3,917		\$19,583		\$15,665	\$3,917	\$19,583			\$22,653	\$5,665	\$28,318



Table I-27. Total Project Cost Summary – Flushing Creek

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Flushing Creek													
16	BANK STABILIZATION	\$8,512	\$1,958	23.0%	\$10,470	0.0%	\$8,512	\$1,958	\$10,470	2026Q3	21.5%	\$10,339	\$2,378	\$12,717
18	CULTURAL RESOURCE PRESERVATION	\$650	\$150	23.0%	\$800	0.0%	\$650	\$150	\$800	2026Q3	21.5%	\$779	\$179	\$958
	(a) 1 PED Activities	\$400	\$92	23.0%	\$492	0.0%	\$400	\$92	\$492	2025Q4	18.8%	\$475	\$109	\$584
	(a2) Construction Activities	\$200	\$46	23.0%	\$246	0.0%	\$200	\$46	\$246	2026Q3	21.5%	\$243	\$56	\$299
	(b) Mitigation with Data Recovery	\$50	\$12	23.0%	\$62	0.0%	\$50	\$12	\$62	2026Q3	21.5%	\$61	\$14	\$75
	CONSTRUCTION ESTIMATE TOTALS:	\$9,162	\$2,107	23.0%	\$11,270		\$9,162	\$2,107	\$11,270			\$11,118	\$2,557	\$13,675
01	LANDS AND DAMAGES	\$134	\$40	30.0%	\$174	0.0%	\$134	\$40	\$174	2025Q4	18.8%	\$159	\$48	\$207
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$92	23.0%	\$492	0.0%	\$400	\$92	\$492	2025Q4	24.2%	\$497	\$114	\$611
	Planning & Environmental Compliance	\$515	\$118	23.0%	\$633	0.0%	\$515	\$118	\$633	2025Q4	24.2%	\$640	\$147	\$787
	Engineering & Design	\$1,080	\$248	23.0%	\$1,328	0.0%	\$1,080	\$248	\$1,328	2025Q4	24.2%	\$1,341	\$308	\$1,650
	Reviews, ATRs, IEPRs, VE	\$150	\$35	23.0%	\$185	0.0%	\$150	\$35	\$185	2025Q4	24.2%	\$186	\$43	\$229
	Contracting & Reprographics	\$50	\$12	23.0%	\$62	0.0%	\$50	\$12	\$62	2025Q4	24.2%	\$62	\$14	\$76
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$876.24	\$202	23.0%	\$1,078	0.0%	\$876	\$202	\$1,078	2026Q3	27.7%	\$1,119	\$257	\$1,376
	Engineering During Construction	\$136	\$31	23.0%	\$167	0.0%	\$136	\$31	\$167	2026Q3	27.7%	\$174	\$40	\$214
	Planning During Construction	\$150	\$35	23.0%	\$185	0.0%	\$150	\$35	\$185	2026Q3	27.7%	\$192	\$44	\$236
	Project Management	\$300	\$69	23.0%	\$369	0.0%	\$300	\$69	\$369	2026Q3	27.7%	\$383	\$88	\$471
	CONTRACT COST SUB-TOTALS:	\$12,953	\$2,989		\$15,942		\$12,953	\$2,989	\$15,942			\$15,870	\$3,661	\$19,531
	Monitoring	\$105	\$24	23.0%	\$129	0.0%	\$105	\$24	\$129	2026Q3	21.5%	\$128	\$29	\$157
	Adaptive Management	\$66	\$15	23.0%	\$81	0.0%	\$66	\$15	\$81	2026Q3	21.5%	\$80	\$18	\$98
	CONTRACT COST TOTALS:	\$13,124	\$3,028		\$16,152		\$13,124	\$3,028	\$16,152			\$16,077	\$3,709	\$19,786

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-28. Total Project Cost Summary – Bronx Zoo and Dam

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Bronx Zoo and Dam													
16	BANK STABILIZATION	\$5,164	\$1,498	29.0%	\$6,662	0.0%	\$5,164	\$1,498	\$6,662	2025Q4	18.8%	\$6,135	\$1,779	\$7,914
18	CULTURAL RESOURCE PRESERVATION	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2025Q4	18.8%	\$177	\$51	\$229
	(a) 1 PED Activities	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2025Q2	17.0%	\$59	\$17	\$75
	(a2) Construction Activities	\$75	\$22	29.0%	\$97	0.0%	\$75	\$22	\$97	2025Q4	18.8%	\$89	\$26	\$115
	(b) Mitigation with Data Recovery	\$25	\$7	29.0%	\$32	0.0%	\$25	\$7	\$32	2025Q4	18.8%	\$30	\$9	\$38
CONSTRUCTION ESTIMATE TOTALS:		\$5,314	\$1,541	29.0%	\$6,855		\$5,314	\$1,541	\$6,855			\$6,312	\$1,831	\$8,143
01	LANDS AND DAMAGES	\$30	\$9	30.0%	\$39	0.0%	\$30	\$9	\$39	2025Q2	17.0%	\$35	\$11	\$46
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2025Q2	21.9%	\$488	\$141	\$629
	Planning & Environmental Compliance	\$285	\$83	29.0%	\$368	0.0%	\$285	\$83	\$368	2025Q2	21.9%	\$347	\$101	\$448
	Engineering & Design	\$705	\$204	29.0%	\$909	0.0%	\$705	\$204	\$909	2025Q2	21.9%	\$859	\$249	\$1,108
	Reviews, ATRs, IEPRs, VE	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2025Q2	21.9%	\$98	\$28	\$126
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2025Q2	21.9%	\$61	\$18	\$79
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$526.42	\$153	29.0%	\$679	0.0%	\$526	\$153	\$679	2025Q4	24.2%	\$654	\$190	\$843
	Engineering During Construction	\$96	\$28	29.0%	\$124	0.0%	\$96	\$28	\$124	2025Q4	24.2%	\$119	\$35	\$154
	Planning During Construction	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2025Q4	24.2%	\$186	\$54	\$240
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2025Q4	24.2%	\$248	\$72	\$320
CONTRACT COST SUB-TOTALS:		\$7,837	\$2,273		\$10,110		\$7,837	\$2,273	\$10,110			\$9,408	\$2,729	\$12,136
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2025Q4	0.0%	\$129	\$37	\$166
	Adaptive Management	\$557	\$161	29.0%	\$718	0.0%	\$557	\$161	\$718	2025Q4	0.0%	\$557	\$161	\$718
CONTRACT COST TOTALS:		\$8,522	\$2,472		\$10,993		\$8,522	\$2,472	\$10,993			\$10,093	\$2,927	\$13,020



Table I-29. Total Project Cost Summary – Stone Mill Dam

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Stone Mill Dam													
16	BANK STABILIZATION	\$1,143	\$331	29.0%	\$1,474	0.0%	\$1,143	\$331	\$1,474	2025Q3	17.9%	\$1,347	\$391	\$1,738
18	CULTURAL RESOURCE PRESERVATION	\$250	\$73	29.0%	\$323	0.0%	\$250	\$73	\$323	2025Q3	17.9%	\$294	\$85	\$379
	(a) 1 PED Activities	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2025Q2	17.0%	\$117	\$34	\$151
	(a2) Construction Activities	\$125	\$36	29.0%	\$161	0.0%	\$125	\$36	\$161	2025Q3	17.9%	\$147	\$43	\$190
	(b) Mitigation with Data Recovery	\$25	\$7	29.0%	\$32	0.0%	\$25	\$7	\$32	2025Q3	17.9%	\$29	\$9	\$38
	CONSTRUCTION ESTIMATE TOTALS:	\$1,393	\$404	29.0%	\$1,796		\$1,393	\$404	\$1,796			\$1,641	\$476	\$2,117
01	LANDS AND DAMAGES	\$30	\$9	30.0%	\$39	0.0%	\$30	\$9	\$39	2025Q2	17.0%	\$35	\$11	\$46
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2025Q2	21.9%	\$488	\$141	\$629
	Planning & Environmental Compliance	\$185	\$54	29.0%	\$239	0.0%	\$185	\$54	\$239	2025Q2	21.9%	\$225	\$65	\$291
	Engineering & Design	\$545	\$158	29.0%	\$703	0.0%	\$545	\$158	\$703	2025Q2	21.9%	\$664	\$193	\$857
	Reviews, ATRs, IEPRs, VE	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2025Q2	21.9%	\$98	\$28	\$126
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2025Q2	21.9%	\$61	\$18	\$79
31	CONSTRUCTION MANAGEMENT													
	Construction Management	\$384	\$111	29.0%	\$495	0.0%	\$384	\$111	\$495	2025Q3	23.0%	\$472	\$137	\$609
	Engineering During Construction	\$64	\$19	29.0%	\$83	0.0%	\$64	\$19	\$83	2025Q3	23.0%	\$79	\$23	\$102
	Planning During Construction	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2025Q3	23.0%	\$123	\$36	\$159
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2025Q3	23.0%	\$246	\$71	\$317
	CONTRACT COST SUB-TOTALS:	\$3,431	\$995		\$4,426		\$3,431	\$995	\$4,426			\$4,132	\$1,199	\$5,331
	Monitoring	\$81	\$24	29.0%	\$105	0.0%	\$81	\$24	\$105	2025Q3	17.9%	\$96	\$28	\$123
	Adaptive Management	\$99	\$29	29.0%	\$128	0.0%	\$99	\$29	\$128	2025Q3	17.9%	\$117	\$34	\$151
	CONTRACT COST TOTALS:	\$3,611	\$1,048		\$4,659		\$3,611	\$1,048	\$4,659			\$4,345	\$1,260	\$5,606

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-40. Total Project Cost Summary – Shoelace Park

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19						
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
Shoelace Park														
16	BANK STABILIZATION	\$11,155	\$3,235	29.0%	\$14,390	0.0%	\$11,155	\$3,235	\$14,390	2029Q3	32.7%	\$14,804	\$4,293	\$19,098
18	CULTURAL RESOURCE PRESERVATION	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2029Q3	32.7%	\$265	\$77	\$342
	(a) 1 PED Activities	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2029Q2	31.7%	\$66	\$19	\$85
	(a2) Construction Activities	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2029Q3	32.7%	\$133	\$38	\$171
	(b) Mitigation with Data Recovery	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2029Q3	32.7%	\$66	\$19	\$86
CONSTRUCTION ESTIMATE TOTALS:		\$11,355	\$3,293	29.0%	\$14,648		\$11,355	\$3,293	\$14,648			\$15,069	\$4,370	\$19,439
01	LANDS AND DAMAGES	\$45	\$14	30.0%	\$59	0.0%	\$45	\$14	\$59	2029Q2	31.7%	\$59	\$18	\$77
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2029Q2	41.8%	\$567	\$164	\$731
	Planning & Environmental Compliance	\$515	\$149	29.0%	\$664	0.0%	\$515	\$149	\$664	2029Q2	41.8%	\$730	\$212	\$942
	Engineering & Design	\$1,255	\$364	29.0%	\$1,619	0.0%	\$1,255	\$364	\$1,619	2029Q2	41.8%	\$1,779	\$516	\$2,295
	Reviews, ATRs, IEPRs, VE	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2029Q2	41.8%	\$213	\$62	\$274
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2029Q2	41.8%	\$71	\$21	\$91
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,130.47	\$328	29.0%	\$1,458	0.0%	\$1,130	\$328	\$1,458	2029Q3	43.2%	\$1,619	\$469	\$2,088
	Engineering During Construction	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2029Q3	43.2%	\$115	\$33	\$148
	Planning During Construction	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2029Q3	43.2%	\$143	\$42	\$185
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2029Q3	43.2%	\$286	\$83	\$369
CONTRACT COST SUB-TOTALS:		\$15,280	\$4,432		\$19,712		\$15,280	\$4,432	\$19,712			\$20,651	\$5,989	\$26,640
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2029Q3	32.7%	\$171	\$49	\$220
	Adaptive Management	\$648	\$188	29.0%	\$835	0.0%	\$648	\$188	\$835	2029Q3	32.7%	\$859	\$249	\$1,109
CONTRACT COST TOTALS:		\$16,056	\$4,657		\$20,713		\$16,056	\$4,657	\$20,713			\$21,681		\$27,969

April 2020



Table I-30. Total Project Cost Summary – Bronxville Lake

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 19-Nov-19 Effective Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19								
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	Bronxville Lake													
16	BANK STABILIZATION	\$7,448	\$2,160	29.0%	\$9,608	0.0%	\$7,448	\$2,160	\$9,608	2031Q4	41.9%	\$10,565	\$3,064	\$13,629
18	CULTURAL RESOURCE PRESERVATION	\$250	\$73	29.0%	\$323	0.0%	\$250	\$73	\$323	2031Q4	41.9%	\$354	\$103	\$456
	(a)1 PED Activities	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2031Q2	39.7%	\$70	\$20	\$90
	(a2) Construction Activities	\$125	\$36	29.0%	\$161	0.0%	\$125	\$36	\$161	2031Q4	41.9%	\$177	\$51	\$229
	(b) Mitigation with Data Recovery	\$75	\$22	29.0%	\$97	0.0%	\$75	\$22	\$97	2031Q4	41.9%	\$106	\$31	\$137
	CONSTRUCTION ESTIMATE TOTALS:	\$7,698	\$2,232	29.0%	\$9,930		\$7,698	\$2,232	\$9,930			\$10,919	\$3,166	\$14,085
01	LANDS AND DAMAGES	\$75	\$23	30.0%	\$98	0.0%	\$75	\$23	\$98	2031Q2	39.7%	\$105	\$31	\$136
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2031Q2	53.3%	\$613	\$178	\$791
	Planning & Environmental Compliance	\$415	\$120	29.0%	\$535	0.0%	\$415	\$120	\$535	2031Q2	53.3%	\$636	\$185	\$821
	Engineering & Design	\$1,125	\$326	29.0%	\$1,451	0.0%	\$1,125	\$326	\$1,451	2031Q2	53.3%	\$1,725	\$500	\$2,225
	Reviews, ATRs, IEPRs, VE	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2031Q2	53.3%	\$230	\$67	\$297
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2031Q2	53.3%	\$77	\$22	\$99
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$764.80	\$222	29.0%	\$987	0.0%	\$765	\$222	\$987	2031Q4	56.4%	\$1,196	\$347	\$1,543
	Engineering During Construction	\$112	\$32	29.0%	\$144	0.0%	\$112	\$32	\$144	2031Q4	56.4%	\$175	\$51	\$226
	Planning During Construction	\$150	\$44	29.0%	\$194	0.0%	\$150	\$44	\$194	2031Q4	56.4%	\$235	\$68	\$303
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2031Q4	56.4%	\$313	\$91	\$403
	CONTRACT COST SUB-TOTALS:	\$11,140	\$3,231		\$14,371		\$11,140	\$3,231	\$14,371			\$16,223	\$4,706	\$20,929
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2031Q4	41.9%	\$182	\$53	\$235
	Adaptive Management	\$669	\$194	29.0%	\$863	0.0%	\$669	\$194	\$863	2031Q4	41.9%	\$949	\$275	\$1,224
	CONTRACT COST TOTALS:	\$11,937	\$3,463		\$15,400		\$11,937	\$3,463	\$15,400			\$17,355	\$5,034	\$22,389

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-31. Total Project Cost Summary – Garth Woods/Harney Road

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Garth Wood-Harney Road													
16	BANK STABILIZATION	\$4,389	\$1,273	29.0%	\$5,662	0.0%	\$4,389	\$1,273	\$5,662	2027Q3	25.1%	\$5,491	\$1,592	\$7,083
18	CULTURAL RESOURCE PRESERVATION	\$250	\$73	29.0%	\$323	0.0%	\$250	\$73	\$323	2027Q3	25.1%	\$312	\$91	\$403
	(a) 1 PED Activities	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2027Q2	24.2%	\$62	\$18	\$80
	(a2) Construction Activities	\$175	\$51	29.0%	\$226	0.0%	\$175	\$51	\$226	2027Q3	25.1%	\$219	\$63	\$282
	(b) Mitigation with Data Recovery	\$25	\$7	29.0%	\$32	0.0%	\$25	\$7	\$32	2027Q3	25.1%	\$31	\$9	\$40
	CONSTRUCTION ESTIMATE TOTALS:	\$4,639	\$1,345	29.0%	\$5,985		\$4,639	\$1,345	\$5,985			\$5,803	\$1,683	\$7,486
01	LANDS AND DAMAGES	\$60	\$18	30.0%	\$78	0.0%	\$60	\$18	\$78	2027Q2	24.2%	\$74	\$22	\$97
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$116	29.0%	\$516	0.0%	\$400	\$116	\$516	2027Q2	31.3%	\$525	\$152	\$678
	Planning & Environmental Compliance	\$285	\$83	29.0%	\$368	0.0%	\$285	\$83	\$368	2027Q2	31.3%	\$374	\$109	\$483
	Engineering & Design	\$925	\$268	29.0%	\$1,193	0.0%	\$925	\$268	\$1,193	2027Q2	31.3%	\$1,215	\$352	\$1,567
	Reviews, ATRs, IEPRs, VE	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2027Q2	31.3%	\$131	\$38	\$169
	Contracting & Reprographics	\$50	\$15	29.0%	\$65	0.0%	\$50	\$15	\$65	2027Q2	31.3%	\$66	\$19	\$85
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$458.92	\$133	29.0%	\$592	0.0%	\$459	\$133	\$592	2027Q3	32.6%	\$609	\$176	\$785
	Engineering During Construction	\$80	\$23	29.0%	\$103	0.0%	\$80	\$23	\$103	2027Q3	32.6%	\$106	\$31	\$137
	Planning During Construction	\$100	\$29	29.0%	\$129	0.0%	\$100	\$29	\$129	2027Q3	32.6%	\$133	\$38	\$171
	Project Management	\$200	\$58	29.0%	\$258	0.0%	\$200	\$58	\$258	2027Q3	32.6%	\$265	\$77	\$342
	CONTRACT COST SUB-TOTALS:	\$7,298	\$2,117		\$9,415		\$7,298	\$2,117	\$9,415			\$9,301	\$2,698	\$11,999
	Monitoring	\$129	\$37	29.0%	\$166	0.0%	\$129	\$37	\$166	2027Q3	25.1%	\$161	\$47	\$207
	Adaptive Management	\$575	\$167	29.0%	\$741	0.0%	\$575	\$167	\$741	2027Q3	25.1%	\$719	\$209	\$928
	CONTRACT COST TOTALS:	\$8,001	\$2,321		\$10,323		\$8,001	\$2,321	\$10,323			\$10,181	\$2,953	\$13,134



Table I-32. Total Project Cost Summary – Oak Island Yards

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Oak Island Yards													
16	BANK STABILIZATION	\$6,315	\$1,579	25.0%	\$7,894	0.0%	\$6,315	\$1,579	\$7,894	2036Q3	63.2%	\$10,308	\$2,577	\$12,885
18	CULTURAL RESOURCE PRESERVATION	\$75	\$19	25.0%	\$94	0.0%	\$75	\$19	\$94	2036Q3	63.2%	\$121	\$30	\$151
	(a) 1 PED Activities	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2035Q4	59.7%	\$80	\$20	\$100
	(a2) Construction Activities	\$25	\$6	25.0%	\$31	0.0%	\$25	\$6	\$31	2036Q3	63.2%	\$41	\$10	\$51
	(b) Mitigation with Data Recovery	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$6,390	\$1,598	25.0%	\$7,988		\$6,390	\$1,598	\$7,988			\$10,429	\$2,607	\$13,036
01	LANDS AND DAMAGES	\$2,730	\$819	30.0%	\$3,549	0.0%	\$2,730	\$819	\$3,549	2035Q4	59.7%	\$4,359	\$1,308	\$5,666
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2035Q4	83.4%	\$734	\$183	\$917
	Planning & Environmental Compliance	\$485	\$121	25.0%	\$606	0.0%	\$485	\$121	\$606	2035Q4	83.4%	\$889	\$222	\$1,112
	Engineering & Design	\$705	\$176	25.0%	\$881	0.0%	\$705	\$176	\$881	2035Q4	83.4%	\$1,293	\$323	\$1,616
	Reviews, ATRs, IEPRs, VE	\$100	\$25	25.0%	\$125	0.0%	\$100	\$25	\$125	2035Q4	83.4%	\$183	\$46	\$229
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2035Q4	83.4%	\$92	\$23	\$115
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$634.03	\$159	25.0%	\$793	0.0%	\$634	\$159	\$793	2036Q3	89.0%	\$1,198	\$300	\$1,498
	Engineering During Construction	\$136	\$34	25.0%	\$170	0.0%	\$136	\$34	\$170	2036Q3	89.0%	\$257	\$64	\$321
	Planning During Construction	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2036Q3	89.0%	\$283	\$71	\$354
	Project Management	\$300	\$75	25.0%	\$375	0.0%	\$300	\$75	\$375	2036Q3	89.0%	\$567	\$142	\$709
	CONTRACT COST SUB-TOTALS:	\$12,080	\$3,157		\$15,237		\$12,080	\$3,157	\$15,237			\$20,285	\$5,289	\$25,574
	Monitoring	\$81	\$20	25.0%	\$101	0.0%	\$81	\$20	\$101	2036Q3	63.2%	\$132	\$33	\$165
	Adaptive Management	\$82	\$21	25.0%	\$103	0.0%	\$82	\$21	\$103	2036Q3	63.2%	\$134	\$34	\$168
	CONTRACT COST TOTALS:	\$12,243	\$3,197		\$15,441		\$12,243	\$3,197	\$15,441			\$20,551	\$5,356	\$25,906

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-33. Total Project Cost Summary – Essex County Branch Brook Park

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Essex County Branch Brook Park													
16	BANK STABILIZATION	\$31,720	\$7,930	25.0%	\$39,650	0.0%	\$31,720	\$7,930	\$39,650	2032Q2	43.9%	\$45,658	\$11,415	\$57,073
18	CULTURAL RESOURCE PRESERVATION	\$200	\$50	25.0%	\$250	0.0%	\$200	\$50	\$250	2032Q2	43.9%	\$288	\$72	\$360
	(a) 1 PED Activities	\$0	\$0	25.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(a2) Construction Activities	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2032Q2	43.9%	\$72	\$18	\$90
	(b) Mitigation with Data Recovery	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2032Q2	43.9%	\$216	\$54	\$270
	CONSTRUCTION ESTIMATE TOTALS:	\$31,920	\$7,980	25.0%	\$39,900		\$31,920	\$7,980	\$39,900			\$45,946	\$11,487	\$57,433
01	LANDS AND DAMAGES	\$75	\$23	30.0%	\$98	0.0%	\$75	\$23	\$98	2031Q2	39.7%	\$105	\$31	\$136
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2031Q2	53.3%	\$613	\$153	\$767
	Planning & Environmental Compliance	\$440	\$110	25.0%	\$550	0.0%	\$440	\$110	\$550	2031Q2	53.3%	\$675	\$169	\$843
	Engineering & Design	\$1,250	\$313	25.0%	\$1,563	0.0%	\$1,250	\$313	\$1,563	2031Q2	53.3%	\$1,917	\$479	\$2,396
	Reviews, ATRs, IEPRs, VE	\$150	\$38	25.0%	\$188	0.0%	\$150	\$38	\$188	2031Q2	53.3%	\$230	\$57	\$287
	Contracting & Reprographics	\$50	\$13	25.0%	\$63	0.0%	\$50	\$13	\$63	2031Q2	53.3%	\$77	\$19	\$96
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$3,192.01	\$798	25.0%	\$3,990	0.0%	\$3,192	\$798	\$3,990	2032Q2	59.5%	\$5,090	\$1,272	\$6,362
	Engineering During Construction	\$200	\$50	25.0%	\$250	0.0%	\$200	\$50	\$250	2032Q2	59.5%	\$319	\$80	\$399
	Planning During Construction	\$200	\$50	25.0%	\$250	0.0%	\$200	\$50	\$250	2032Q2	59.5%	\$319	\$80	\$399
	Project Management	\$400	\$100	25.0%	\$500	0.0%	\$400	\$100	\$500	2032Q2	59.5%	\$638	\$159	\$797
	CONTRACT COST SUB-TOTALS:	\$38,277	\$9,573		\$47,850		\$38,277	\$9,573	\$47,850			\$55,928	\$13,987	\$69,915
	Monitoring	\$153	\$38	25.0%	\$191	0.0%	\$153	\$38	\$191	2032Q2	43.9%	\$220	\$55	\$275
	Adaptive Management	\$3,189	\$797	25.0%	\$3,987	0.0%	\$3,189	\$797	\$3,987	2032Q2	43.9%	\$4,591	\$1,148	\$5,738
	CONTRACT COST TOTALS:	\$41,619	\$10,409		\$52,028		\$41,619	\$10,409	\$52,028			\$60,738	\$15,190	\$75,928



Table I-34. Total Project Cost Summary – Metromedia Tract

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Metromedia													
16	BANK STABILIZATION	\$19,610	\$4,118	21.0%	\$23,728	0.0%	\$19,610	\$4,118	\$23,728	2030Q3	36.7%	\$26,807	\$5,629	\$32,437
18	CULTURAL RESOURCE PRESERVATION	\$50	\$11	21.0%	\$61	0.0%	\$50	\$11	\$61	2030Q3	36.7%	\$67	\$14	\$81
	(a) 1 PED Activities	\$50	\$11	21.0%	\$61	0.0%	\$50	\$11	\$61	2029Q4	33.7%	\$67	\$14	\$81
	(a2) Construction Activities	\$0	\$0	21.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	(b) Mitigation with Data Recovery	\$0	\$0	21.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$19,660	\$4,129	21.0%	\$23,789		\$19,660	\$4,129	\$23,789			\$26,874	\$5,644	\$32,518
01	LANDS AND DAMAGES	\$491	\$172	35.0%	\$662	0.0%	\$491	\$172	\$662	2029Q4	33.7%	\$656	\$230	\$885
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$84	21.0%	\$484	0.0%	\$400	\$84	\$484	2029Q4	44.6%	\$578	\$121	\$700
	Planning & Environmental Compliance	\$415	\$87	21.0%	\$502	0.0%	\$415	\$87	\$502	2029Q4	44.6%	\$600	\$126	\$726
	Engineering & Design	\$860	\$181	21.0%	\$1,041	0.0%	\$860	\$181	\$1,041	2029Q4	44.6%	\$1,243	\$261	\$1,505
	Reviews, ATRs, IEPRs, VE	\$150	\$32	21.0%	\$182	0.0%	\$150	\$32	\$182	2029Q4	44.6%	\$217	\$46	\$262
	Contracting & Reprographics	\$50	\$11	21.0%	\$61	0.0%	\$50	\$11	\$61	2029Q4	44.6%	\$72	\$15	\$87
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,961.01	\$412	21.0%	2,373	0.0%	\$1,961	\$412	\$2,373	2030Q3	48.9%	\$2,920	\$613	\$3,533
	Engineering During Construction	\$200	\$42	21.0%	242	0.0%	\$200	\$42	\$242	2030Q3	48.9%	\$298	\$63	\$360
	Planning During Construction	\$200	\$42	21.0%	242	0.0%	\$200	\$42	\$242	2030Q3	48.9%	\$298	\$63	\$360
	Project Management	\$400	\$84	21.0%	484	0.0%	\$400	\$84	\$484	2030Q3	48.9%	\$596	\$125	\$721
	CONTRACT COST SUB-TOTALS:	\$24,787	\$5,274		\$30,061		\$24,787	\$5,274	\$30,061			\$34,352	\$7,306	\$41,658
	Monitoring	\$153	\$32	21.0%	\$185	0.0%	\$153	\$32	\$185	2030Q3	36.7%	\$209	\$44	\$253
	Adaptive Management	\$711	\$149	21.0%	\$861	0.0%	\$711	\$149	\$861	2030Q3	36.7%	\$972	\$204	\$1,177
	CONTRACT COST TOTALS:	\$25,651	\$5,455		\$31,106		\$25,651	\$5,455	\$31,106			\$35,533	\$7,554	\$43,087

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study Final Integrated Feasibility Report & Environmental Assessment

Table I-35. Total Project Cost Summary – Meadowlark Marsh

PROJECT: Hudson Raritan Estuary
LOCATION: New York / New Jersey
This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Meadowlark Marsh													
16	BANK STABILIZATION	\$17,959	\$3,771	21.0%	\$21,730	0.0%	\$17,959	\$3,771	\$21,730	2034Q3	53.9%	\$27,631	\$5,803	\$33,434
18	CULTURAL RESOURCE PRESERVATION	\$225	\$47	21.0%	\$272	0.0%	\$225	\$47	\$272	2034Q3	53.9%	\$343	\$72	\$415
	(a) 1 PED Activities	\$100	\$21	21.0%	\$121	0.0%	\$100	\$21	\$121	2033Q4	50.5%	\$150	\$32	\$182
	(a2) Construction Activities	\$25	\$5	21.0%	\$30	0.0%	\$25	\$5	\$30	2034Q3	53.9%	\$38	\$8	\$47
	(b) Mitigation with Data Recovery	\$100	\$21	21.0%	\$121	0.0%	\$100	\$21	\$121	2034Q3	53.9%	\$154	\$32	\$186
	CONSTRUCTION ESTIMATE TOTALS:	\$18,184	\$3,819	21.0%	\$22,002		\$18,184	\$3,819	\$22,002			\$27,974	\$5,875	\$33,848
01	LANDS AND DAMAGES	\$781	\$273	35.0%	\$1,055	0.0%	\$781	\$273	\$1,055	2033Q4	50.5%	\$1,176	\$411	\$1,587
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$400	\$84	21.0%	\$484	0.0%	\$400	\$84	\$484	2033Q4	69.2%	\$677	\$142	\$819
	Planning & Environmental Compliance	\$415	\$87	21.0%	\$502	0.0%	\$415	\$87	\$502	2033Q4	69.2%	\$702	\$147	\$850
	Engineering & Design	\$1,320	\$277	21.0%	\$1,597	0.0%	\$1,320	\$277	\$1,597	2033Q4	69.2%	\$2,234	\$469	\$2,703
	Reviews, ATRs, IEPRs, VE	\$150	\$32	21.0%	\$182	0.0%	\$150	\$32	\$182	2033Q4	69.2%	\$254	\$53	\$307
	Contracting & Reprographics	\$50	\$11	21.0%	\$61	0.0%	\$50	\$11	\$61	2033Q4	69.2%	\$85	\$18	\$102
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,808.39	\$380	21.0%	\$2,188	0.0%	\$1,808	\$380	\$2,188	2034Q3	74.4%	\$3,154	\$662	\$3,816
	Project Operation:	\$200	\$42	21.0%	\$242	0.0%	\$200	\$42	\$242	2034Q3	74.4%	\$349	\$73	\$422
	Project Management	\$200	\$42	21.0%	\$242	0.0%	\$200	\$42	\$242	2034Q3	74.4%	\$349	\$73	\$422
	Project Management	\$400	\$84	21.0%	\$484	0.0%	\$400	\$84	\$484	2034Q3	74.4%	\$698	\$146	\$844
	CONTRACT COST SUB-TOTALS:	\$23,908	\$5,130		\$29,039		\$23,908	\$5,130	\$29,039			\$37,650	\$8,071	\$45,721
	Monitoring	\$153	\$32	21.0%	\$185	0.0%	\$153	\$32	\$185	2034Q3	0.0%	\$153	\$32	\$185
	Adaptive Management	\$368	\$77	21.0%	\$445	0.0%	\$368	\$77	\$445	2034Q3	0.0%	\$368	\$77	\$445
	CONTRACT COST TOTALS:	\$24,429	\$5,239		\$29,668		\$24,429	\$5,239	\$29,668			\$38,171	\$8,180	\$46,351



Table I-36. Total Project Cost Summary – Naval Weapons Station Earle

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Naval Weapons Station Earle													
06	FISH & WILDLIFE FACILITIES	\$3,814	\$1,411	37.0%	\$5,225	0.0%	\$3,814	\$1,411	\$5,225	2026Q2	20.5%	\$4,598	\$1,701	\$6,299
18	CULTURAL RESOURCE PRESERVATION	\$125	\$46	37.0%	\$171	0.0%	\$125	\$46	\$171	2026Q2	20.5%	\$149	\$55	\$205
	(a) 1 PED Activities	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2025Q3	17.9%	\$59	\$22	\$81
	(a2) Construction Activities	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2026Q2	20.5%	\$60	\$22	\$83
	(b) Mitigation with Data Recovery	\$25	\$9	37.0%	\$34	0.0%	\$25	\$9	\$34	2026Q2	20.5%	\$30	\$11	\$41
	CONSTRUCTION ESTIMATE TOTALS:	\$3,939	\$1,457	37.0%	\$5,397		\$3,939	\$1,457	\$5,397			\$4,747	\$1,756	\$6,504
01	LANDS AND DAMAGES	\$15	\$5	30.0%	\$20	0.0%	\$15	\$5	\$20	2025Q3	17.9%	\$18	\$5	\$23
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$300	\$111	37.0%	\$411	0.0%	\$300	\$111	\$411	2025Q3	23.0%	\$369	\$137	\$506
	Planning & Environmental Compliance	\$130	\$48	37.0%	\$178	0.0%	\$130	\$48	\$178	2025Q3	23.0%	\$160	\$59	\$219
	Engineering & Design	\$645	\$239	37.0%	\$884	0.0%	\$645	\$239	\$884	2025Q3	23.0%	\$794	\$294	\$1,087
	Reviews, ATRs, IEPRs, VE	\$80	\$30	37.0%	\$110	0.0%	\$80	\$30	\$110	2025Q3	23.0%	\$98	\$36	\$135
	Contracting & Reprographics	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2025Q3	23.0%	\$62	\$23	\$84
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$388.91	\$144	37.0%	\$533	0.0%	\$389	\$144	\$533	2026Q2	26.5%	\$492	\$182	\$674
	Engineering During Construction	\$64	\$24	37.0%	\$88	0.0%	\$64	\$24	\$88	2026Q2	26.5%	\$81	\$30	\$111
	Planning During Construction	\$70	\$26	37.0%	\$96	0.0%	\$70	\$26	\$96	2026Q2	26.5%	\$89	\$33	\$121
	Project Management	\$200	\$74	37.0%	\$274	0.0%	\$200	\$74	\$274	2026Q2	26.5%	\$253	\$94	\$347
	CONTRACT COST SUB-TOTALS:	\$5,882	\$2,175		\$8,057		\$5,882	\$2,175	\$8,057			\$7,162	\$2,649	\$9,811
	Monitoring	\$57	\$21	37.0%	\$78	0.0%	\$57	\$21	\$78	2026Q2	20.5%	\$69	\$25	\$94
	Adaptive Management	\$272	\$101	37.0%	\$373	0.0%	\$272	\$101	\$373	2026Q2	20.5%	\$328	\$121	\$449
	CONTRACT COST TOTALS:	\$6,211	\$3,234		\$8,508		\$6,211	\$2,297	\$8,508			\$7,559	\$2,796	\$10,354

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Table I-37. Total Project Cost Summary – Bush Terminal

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Bush Terminal													
06	FISH & WILDLIFE FACILITIES	\$2,464	\$912	37.0%	\$3,376	0.0%	\$2,464	\$912	\$3,376	2029Q4	33.7%	\$3,295	\$1,219	\$4,514
18	CULTURAL RESOURCE PRESERVATION	\$125	\$46	37.0%	\$171	0.0%	\$125	\$46	\$171	2029Q4	33.7%	\$166	\$61	\$228
	(a) 1 PED Activities	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2029Q2	31.7%	\$66	\$24	\$90
	(a2) Construction Activities	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2029Q4	33.7%	\$67	\$25	\$92
	(b) Mitigation with Data Recovery	\$25	\$9	37.0%	\$34	0.0%	\$25	\$9	\$34	2029Q4	33.7%	\$33	\$12	\$46
	CONSTRUCTION ESTIMATE TOTALS:	\$2,589	\$958	37.0%	\$3,547		\$2,589	\$958	\$3,547			\$3,461	\$1,280	\$4,741
01	LANDS AND DAMAGES	\$45	\$14	30.0%	\$59	0.0%	\$45	\$14	\$59	2029Q2	31.7%	\$59	\$18	\$77
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$300	\$111	37.0%	\$411	0.0%	\$300	\$111	\$411	2029Q2	41.8%	\$425	\$157	\$583
	Planning & Environmental Compliance	\$130	\$48	37.0%	\$178	0.0%	\$130	\$48	\$178	2029Q2	41.8%	\$184	\$68	\$252
	Engineering & Design	\$795	\$294	37.0%	\$1,089	0.0%	\$795	\$294	\$1,089	2029Q2	41.8%	\$1,127	\$417	\$1,544
	Reviews, ATRs, IEPRs, VE	\$80	\$30	37.0%	\$110	0.0%	\$80	\$30	\$110	2029Q2	41.8%	\$113	\$42	\$155
	Contracting & Reprographics	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2029Q2	41.8%	\$71	\$26	\$97
31	CONSTRUCTION MANAGEMENT													
	Construction Management	\$310	\$115	37.0%	\$425	0.0%	\$310	\$115	\$425	2029Q4	44.6%	\$448	\$166	\$614
	Engineering During Construction	\$56	\$21	37.0%	\$77	0.0%	\$56	\$21	\$77	2029Q4	44.6%	\$81	\$30	\$111
	Planning During Construction	\$60	\$22	37.0%	\$82	0.0%	\$60	\$22	\$82	2029Q4	44.6%	\$87	\$32	\$119
	Project Management	\$200	\$74	37.0%	\$274	0.0%	\$200	\$74	\$274	2029Q4	44.6%	\$289	\$107	\$396
	CONTRACT COST SUB-TOTALS:	\$4,615	\$1,704		\$6,319		\$4,615	\$1,704	\$6,319			\$6,346	\$2,344	\$8,690
	Monitoring	\$108	\$40	37.0%	\$148	0.0%	\$108	\$40	\$148	2029Q4	33.7%	\$144	\$53	\$198
	Adaptive Management	\$342	\$126	37.0%	\$468	0.0%	\$342	\$126	\$468	2029Q4	33.7%	\$457	\$169	\$626
	CONTRACT COST TOTALS:	\$5,065	\$1,871		\$6,935		\$5,065	\$1,871	\$6,935			\$6,947	\$2,566	\$9,514



Table I-38. Total Project Cost Summary – Head of Jamaica Bay

PROJECT: Hudson Raritan Estuary
 LOCATION: New York / New Jersey
 This Estimate reflects the scope and schedule in report;

Draft Feasibility Report

DISTRICT: NAN
 POC: CHIEF, COST ENGINEERING, Mukesh Kumar

PREPARED: 4/14/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Effective Price Level:		19-Nov-19 1-Oct-19		Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
Head of Jamaica Bay														
06	FISH & WILDLIFE FACILITIES	\$2,057	\$761	37.0%	\$2,818	0.0%	\$2,057	\$761	\$2,818	2027Q3	25.1%	\$2,573	\$952	\$3,525
18	CULTURAL RESOURCE PRESERVATION	\$125	\$46	37.0%	\$171	0.0%	\$125	\$46	\$171	2027Q3	25.1%	\$156	\$58	\$214
	(a) 1 PED Activities	\$100	\$37	37.0%	\$137	0.0%	\$100	\$37	\$137	2027Q3	25.1%	\$125	\$46	\$171
	(a2) Construction Activities	\$10	\$4	37.0%	\$14	0.0%	\$10	\$4	\$14	2027Q3	25.1%	\$13	\$5	\$17
	(b) Mitigation with Data Recovery	\$15	\$6	37.0%	\$21	0.0%	\$15	\$6	\$21	2027Q3	25.1%	\$19	\$7	\$26
CONSTRUCTION ESTIMATE TOTALS:		\$2,182	\$807	37.0%	\$2,989		\$2,182	\$807	\$2,989			\$2,729	\$1,010	\$3,739
01	LANDS AND DAMAGES	\$15	\$5	30.0%	\$20	0.0%	\$15	\$5	\$20	2027Q3	25.1%	\$19	\$6	\$24
30	PLANNING, ENGINEERING & DESIGN													
	Project Management	\$300	\$111	37.0%	\$411	0.0%	\$300	\$111	\$411	2027Q3	32.6%	\$398	\$147	\$545
	Planning & Environmental Compliance	\$130	\$48	37.0%	\$178	0.0%	\$130	\$48	\$178	2027Q3	32.6%	\$172	\$64	\$236
	Engineering & Design	\$645	\$239	37.0%	\$884	0.0%	\$645	\$239	\$884	2027Q3	32.6%	\$855	\$316	\$1,172
	Reviews, ATRs, IEPRs, VE	\$80	\$30	37.0%	\$110	0.0%	\$80	\$30	\$110	2027Q3	32.6%	\$106	\$39	\$145
	Contracting & Reprographics	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2027Q3	32.6%	\$66	\$25	\$91
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$208.17	\$77	37.0%	\$285	0.0%	\$208	\$77	\$285	2027Q3	32.6%	\$276	\$102	\$378
	Engineering During Construction	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2027Q3	32.6%	\$66	\$25	\$91
	Planning During Construction	\$50	\$19	37.0%	\$69	0.0%	\$50	\$19	\$69	2027Q3	32.6%	\$66	\$25	\$91
	Project Management	\$100	\$37	37.0%	\$137	0.0%	\$100	\$37	\$137	2027Q3	32.6%	\$133	\$49	\$182
CONTRACT COST SUB-TOTALS:		\$3,810	\$1,409		\$5,219		\$3,810	\$1,409	\$5,219			\$4,887	\$1,807	\$6,694
	Monitoring	\$57	\$21	37.0%	\$78	0.0%	\$57	\$21	\$78	2027Q3	25.1%	\$71	\$26	\$98
	Adaptive Management	\$282	\$104	37.0%	\$387	0.0%	\$282	\$104	\$387	2027Q3	25.1%	\$353	\$131	\$484
CONTRACT COST TOTALS:		\$4,149	\$3,234		\$5,684		\$4,149	\$1,534	\$5,684			\$5,312	\$1,964	\$7,276

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Attachment A: MII Reports

Print Date Tue 14 April 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 16:29:39
Summary Page 1

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ProjectCost</u>
Summary			30,398,620.13
HRE - BRONX RIVERS	1.0000	EA	30,398,620.13
Bronx Zoo and Dam	1.0000	EA	5,314,183.72
16 Bank Stabilization	1.0000	EA	5,164,183.72
18 Cultural Resource	1.0000	EA	150,000.00
Bronxville Lake	560.0000	TON	7,697,978.52
16 Bank Stabilization	1.0000	EA	7,447,978.52
18 Cultural Resource	1.0000	EA	250,000.00
Shoelace Park	1.0000	EA	11,354,662.25
16 Bank Stabilization	1.0000	EA	11,154,662.25
18 Cultural Resource	1.0000	EA	200,000.00
Garth Wood-Harney Road	1.0000	EA	4,639,234.93
16 Bank Stabilization	1.0000	EA	4,389,234.93
18 Cultural Resource	1.0000	EA	250,000.00
Stone Mill Dam	1.0000	EA	1,392,560.72
16 Bank Stabilization	1.0000	EA	1,142,560.72
18 Cultural Resource	1.0000	EA	250,000.00

April 2020



Print Date Tue 14 April 2020
Eff. Date 10/9/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 16:35:54

Summary Page 1

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ProjectCost</u>
Summary			9,162,403.09
FLUSHING CREEK			
16 Bank Stabilization	1.0000	EA	9,162,403.09
18 Cultural Resource	1.0000	EA	8,512,403.09
			650,000.00

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Print Date Tue 14 April 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 16:45:12

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			37,844,025.60
HRE - HACKENSACK RIVER	1.0000	EA	37,844,025.60
MEADOWLARK MARSH (Updated) 7.31.2019	1.0000	LS	18,183,880.68
16 Bank Stabilization	1.0000	EA	17,958,880.68
18 Cultural Resource	1.0000	EA	225,000.00
METROMEDIA	1.0000	LS	19,660,144.92
16 Bank Stabilization	1.0000	EA	19,610,144.92
18 Cultural Resource	1.0000	EA	50,000.00

April 2020



Print Date Tue 14 April 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Jamaica Bay Marsh Islands
Hudson River Estuary

Time 16:58:17

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			64,697,664.94
Jamaica Bay - Marsh Islands	1.0000	EA	64,697,664.94
Duck Point	1.0000	EA	13,041,095.30
16 Bank Stabilization	1.0000	EA	13,026,095.30
18 Cultural Resource	1.0000	EA	15,000.00
Elders Center	1.0000	EA	12,014,628.82
16 Bank Stabilization	1.0000	EA	11,999,628.82
18 Cultural Resource	1.0000	EA	15,000.00
Pumpkin Patch East	1.0000	EA	13,304,824.55
16 Bank Stabilization	1.0000	EA	13,289,824.55
18 Cultural Resource	1.0000	EA	15,000.00
Pumpkin Patch West	1.0000	EA	12,268,474.13
16 Bank Stabilization	1.0000	EA	12,253,474.13
18 Cultural Resource	1.0000	EA	15,000.00
Stony Creek	1.0000	EA	14,068,642.15
16 Bank Stabilization	1.0000	EA	14,053,642.15
18 Cultural Resource	1.0000	EA	15,000.00

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Print Date Tue 14 April 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 17:02:12

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			8,709,830.97
Oyster Bay Restoration	1.0000	EA	8,709,830.97
Bush Terminal	1.0000	EA	2,589,023.03
06 Fish and Wildlife	1.0000	EA	2,464,023.03
18 Cultural Resource	1.0000	EA	125,000.00
Head of Jamaica Bay	1.0000	EA	2,181,723.83
06 Fish and Wildlife	1.0000	EA	2,056,723.83
18 Cultural Resource	1.0000	EA	125,000.00
Naval Weapons Station Earle	1.0000	EA	3,939,084.10
06 Fish and Wildlife	1.0000	EA	3,814,084.10
18 Cultural Resource	1.0000	EA	125,000.00

April 2020



Print Date Tue 14 April 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 17:10:08

Summary Page 1

<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ProjectCost</u>
Summary			38,310,430.09
HRE - Lower Passaic River	1.0000	EA	38,310,430.09
Essex County Branch Brook Park	1.0000	EA	31,920,091.57
16 Bank Stabilization	1.0000	EA	31,720,091.57
18 Cultural Resource	1.0000	EA	200,000.00
Oak Island Yards	1.0000	EA	6,390,338.53
16 Bank Stabilization	1.0000	EA	6,315,338.53
18 Cultural Resource	1.0000	EA	75,000.00

Hudson-Raritan Estuary Ecosystem Restoration Feasibility Study

Final Integrated Feasibility Report & Environmental Assessment

Print Date Tue 14 April 2020
Eff. Date 10/10/2019

U.S. Army Corps of Engineers
Project : HRE - Hudson Raritan Estuary
Hudson River Estuary

Time 17:17:55

Summary Page 1

Description	Quantity	UOM	ProjectCost
Summary			47,720,418.48
HRE - Jamaica Bay Perimeter Sites	1.0000	EA	47,720,418.48
Fresh Creek	1.0000	EA	20,406,308.54
16 Bank Stabilization	1.0000	EA	20,081,308.54
18 Cultural Resource	1.0000	EA	325,000.00
Dead Horse Bay	1.0000	EA	27,314,109.94
16 Bank Stabilization	1.0000	EA	27,039,109.94
18 Cultural Resource	1.0000	EA	275,000.00