PROPOSAL

Technical Proposal
(RFP # 03-07-22)

Feasibility-Level Environmental Conditions Studies for a Potential Island Restoration Project at Barren Island Dorchester County, MD

Maryland Environmental Service
Annapolis, Maryland

February 2003

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Consultants with focus

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Transmitted Via Hand Delivery

February 7, 2003

Maryland Environmental Service
2011 Commerce Park Drive
Annapolis, MD 21401

Attn: Ms. Patrice L. Stanley
Procurement Division

Re: Technical Proposal for Feasibility-Level Environmental Conditions Studies for a Potential Island Restoration Project at Barren Island – MES RFP ID# 03-07-22

Dear Ms. Stanley:

BBL is pleased to submit one original and four copies of our Technical Proposal to provide professional scientific services to Maryland Environmental Service (MES) for Feasibility-Level Environmental Conditions Studies for a Potential Island Restoration Project at Barren Island.

BBL is a national leader in environmental science and engineering work (ranked 34th on *Engineering News Record's* [ENR's] list of Top 200 Environmental Firms), with a long and successful history on similar projects. We believe that BBL's leadership and expertise allows us to bring the best possible team to help MES move forward with a program to collect the data and information that are critical to achieving the goal of a successful restoration of Barren Island. We bring to this project demonstrated expertise in sediment and dredge materials management and ecological restoration, as well as extensive experience in conducting a wide variety of ecological and water/sediment quality field studies.

This project will be managed by Timothy Iannuzzi, a Principal Scientist in our Annapolis, Maryland office. Mr. Iannuzzi has more than 14 years of national and regional (Chesapeake Bay) experience in environmental assessments and ecological investigations. In addition, he will be supported by a diverse and experienced team of scientists and engineers with expertise in all of the requisite disciplines that are required to successfully complete this project.

We also believe that our team is uniquely qualified to meet and exceed the requirements of MES for this project due to the following specific factors:

- We have a thorough and clear understanding of the requirements of MES and are fully aware of the critical nature of this project as it relates to MES' participation in the Port of Baltimore long-term dredged material management plan.

326 First Street • Suite 200 • Annapolis, MD 21403-2678
Tel (410) 295-1205 • Fax (410) 295-1225 • www.bbl-inc.com • Offices Nationwide

- Our Project Advisor, Dr. Ram Mohan, and team member, Mr. Timothy Donegan, have assisted MES with delivering quality products (technical analysis, modeling, and engineering design and construction documents) on time and within budget for projects such as Poplar Island and CSX/Cox Creek, where they previously served in key technical roles.

- Our management approach stresses seamless communications between the MES project manager and the BBL project manager, as well as with other key project staff. Our quality and project management goals are unsurpassed in the industry (as discussed in Section 3 of this proposal).

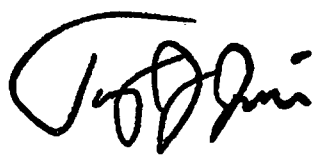
- Our team is not only uniquely qualified, but also consists of a significant MBE/WBE participation.

- Finally, due to the structure of our company and its affiliates (e.g., BBL Sciences – our wetlands and science group; TER – our economics group; and BBLES – our construction and project management group), we also offer MES the unique opportunity to use experts in varied fields under one roof for the added benefit of this project.

Please don't hesitate to call me at 410-295-1205 with any questions you may have regarding the content of BBL's proposal or our team. We sincerely appreciate this opportunity to demonstrate the value of BBL leading MES' consulting services team for this project, and we will strive to not only meet your requirements, but also to exceed your expectations in the process.

Sincerely,

BLASLAND, BOUCK & LEE, INC.



Timothy J. Iannuzzi
Vice President/Principal

TJI/krm
Enclosure: 1 original and 4 copies of proposal

cc: C. Tombes (AWSL)
S. Balu, P.E. (E2CR)
G. Christian (Normandeau Associates)

Table of Contents

Section 1

Standard Form 254

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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STANDARD FORM (SF) 254

ARCHITECT-ENGINEER AND RELATED SERVICES QUESTIONNAIRE

1. Firm Name/Business Address:

Blasland, Bouck & Lee, Inc.
326 First Street, Suite 200
Annapolis, MD 21403-2678

1a. Submittal is for ☐ Parent Company X Branch of Subsidiary Office

2. Year Present Firm Established: 1984

3. Date Prepared: February 5, 2003

4. Specify type of ownership and check below, if applicable.

Corporation, Federal I.D. #16-1448024, D&B #107398604

[ ] Small Business
[ ] Small Disadvantaged Business
[ ] Woman-Owned Business

5. Name of Parent Company, if any:

Blasland, Bouck & Lee, Inc.
6723 Towpath Road, P.O. Box 66
Syracuse, NY 13214-0066

5a. Former Parent Company Name(s), if any, and Year(s) Established:

6. Names of Not More Than Two Principals to Contact: Title/Telephone

1) Timothy J. Iannuzzi, Principal Ecologist (410) 295-1205
2) David F. Ludwig, Ph.D., Principal Scientist (410) 295-1205

7. Present Offices: City/State/Telephone/Number of Personnel Each Office

7a. Total Personnel: 677

Please see attached list of offices

8. Personnel by Discipline: (List each person only once by *primary function.*) **Functions performed by Staff*

160	Administrative	1	Electrical Engineers	0	Oceanographers	21	Toxicologists
0	Architects	*	Estimators	1	Planners: Urban/Regional	5	Atmospheric Scientists
16	Chemical Engineers	57	Geologists	23	Sanitary Engineers	52	Environmental Engineers
49	Civil Engineers	18	Hydrologists	17	Soils Engineers	10	Chemists
28	Construction Inspectors	0	Interior Designers	*	Specification Writers	61	Technicians
25	Draftsmen	2	Landscape Architects	3	Structural Engineers	69	Environmental Scientists
23	Ecologists	3	Mechanical Engineers	4	Surveyors	3	Industrial Hygienists
20	Economists	0	Mining Engineers	0	Transportation Engineers	6	Coastal Engineers

9. Summary of Professional Services Fee Received: (Insert Index Number)

Last Five Years (Most Recent Year First)

	2002	2001	2000	1999	1998
Direct Federal contract work, including overseas	3	3	3	3	2
All other domestic work	8	8	8	8	8
All other foreign work *	1	1	1	1	1

* Firms interested in foreign work, but without such experience, check here: ☐

Ranges of Professional Services Fees Index

1. Less than $100,000
2. $100,000 to $250,000
3. $250,000 to $500,000
4. $500,000 to $1 million
5. $1 million to $2 million
6. $2 million to $5 million
7. $5 million to $10 million
8. $10 million or greater

Attachment to SF 254 Form
Blasland, Bouck & Lee, Inc.

7. Present Offices

City/State	Telephone	Number of Personnel
Albany, NY	(518) 452-7082	5
Ann Arbor, MI	(734) 668-1133	19
Annapolis, MD	(410) 295-1205	9
Atlanta Area, GA	(770) 428-9009	14
Boca Raton, FL	(561) 750-3733	27
Boston Area, MA	(978) 921-0442	5
Buffalo Area, NY	(716) 689-1544	6
Chicago, IL	(312) 674-4937	4
Cincinnati, OH	(513) 762-7888	2
Cranbury, NJ	(609) 860-0590	51
Detroit Area, MI	(248) 377-9162	13
Durham, NC	(919) 544-2244	23
Golden, CO	(303) 231-9115	17
Hartford, CT	(860) 249-7111	1
Irvine, CA	(949) 474-9052	17
Lexington, KY	(859) 253-9036	10
Long Beach, CA	(562) 628-1176	16
Naples, FL	(239) 403-3884	2
New Bedford, MA	(508) 992-3609	5
Pensacola, FL	(850) 492-8220	1
Philadelphia Area, PA	(484) 530-9119	15
Piscataway, NJ	(732) 457-0700	20
Pittsburgh, PA	(412) 231-6624	20
Portland, OR	(503) 535-0696	1
Raleigh Area, NC	(919) 469-1952	17
Reston, VA	(703) 834-0076	9
Rochester, NY	(585) 292-6740	16
Russellville, KY	(270) 725-8400	1
San Francisco Bay Area, CA	(925) 274-1100	1
San Rafael, CA	(415) 492-2844	4
Santa Barbara, CA	(805) 684-4066	3
Seattle, WA	(206) 273-7555	3
St. Louis Area, MO	(636) 898-0050	1
Syracuse, NY	(315) 446-9120	286
Tallahassee, FL	(850) 309-0022	4
Tampa, FL	(813) 933-0697	13
White Plains, NY	(914) 428-1112	16

10. Profile of Firm's Project Experience, Last 5 Years

	Profile Code	Number of Projects	Total Gross Fees (in Thousands)		Profile Code	Number of Projects	Total Gross Fees (in Thousands)		Profile Code	Number of Projects	Total Gross Fees (in Thousands)
1)	004	21	490	11)	073	3	75	21)	101	12	5,200
2)	009	19	850	12)	076	26	1,000	22)	102	210	5,000
3)	021	6	570	13)	078	6	4,810	23)	104	14	2,700
4)	023	8	40	14)	079	8	4,000	24)	106	14	150
5)	028	22	2,170	15)	083	8	320	25)	114	39	6,650
6)	033	17	2,900	16)	088	8	310	26)	115	6	1,350
7)	037	31	20	17)	092	21	7,200	27)	255	56	4,200
8)	042	16	10,700	18)	096	34	13,500	28)	258	14	790
9)	054	9	390	19)	097	32	5,200	29)	262	24	4,000
10)	056	3	360	20)	099	75	5,550	30)	266	56	245,000

11. Project Examples, Last 5 Years

Profile Code	P, C, JV or IE	Project Name and Location	Owner Name and Address	Cost of Work (in Thousands)	Completion Date (Actual or Estimated)
028, 033, 037, 262	P	1. **CERCLA Remedial Investigation, Estuarine Portion of the Passaic River, New Jersey** – BBL is the lead firm conducting a remedial investigation for contaminated sediments in a 6-mile stretch of the Passaic River. Conducted a one-year study as part of this investigation to characterize the ecology of the river and collect data to support an ecological risk assessment. BBL collaborated to perform fisheries and benthic invertebrate surveys, habitat surveys of the river and shoreline areas, water quality investigations, and collections of sediment samples and tissue samples from multiple fish species and blue crab for contaminant analyses. In addition, designed and conducted a detailed, multi-season, year-long bird survey on the river. BBL scientists and economists also designed and implemented a state-of-the-science Creel/Angler Survey of the river to determine human recreational usage and fish consumption patterns.	Tierra Solutions East Brunswick, NJ	$1,000	2001

028, 033, 215, 262	P	2. **Stone Harbor Piping Plover Dredging/Beneficial Re-Use Habitat Restoration Project, New Jersey** – Supporting the Borough of Stone Harbor in evaluating the possible use of dredge materials from the dredging of Stone Harbor navigation channels for dune construction for piping plover habitat. Recently designed and conducted a sediment sampling program for a temporary confined disposal facility (CDF) on the beach adjacent to the harbor. These samples are being used to conduct bioaccumulation tests to determine if any risks exist from contaminants in the CDF. Test results will be used to conduct a focused risk assessment for piping plovers that might be exposed to the dredge materials.	Borough of Stone Harbor, NJ	$95	2003
028, 211, 258	P	3. **Habitat and Ecological Characterization, Tidal River/Estuary Site, Northeastern United States** – Characterized terrestrial habitats and resident biota species for three former agricultural chemical sites along a tidal river/estuary. Activities included upland and wetlands habitat characterization, wetlands delineation, and ecological risk evaluations. These studies indicated that the primary ecological issues at these sites were associated with sediments and salt marsh areas along the river. The ecological assessment also provided a basis for excluding large areas of the site that were developed and located in upland areas from further consideration in the ecological risk assessment.	Confidential Client	$30	2002
028, 214, 262, 258	P	4. **Submerged Aquatic Vegetation (SAV) and Wetlands Surveys, New York** – Using SCUBA, characterized stem density, stem length, biomass, and bed size of American wild celery (Vallisneria americana) in freshwater reaches of a large river in New York. Underwater transects and a random plot design were used to estimate structural parameters of SAV in over 6 miles of river bottom. The use of various species of phytophilous macroinvertebrates and fish were noted in logbooks. The locations, sizes, and types of species in emergent wetlands along the border of the river's edge were mapped. The information was used to establish a range of expected SAV habitat and wetland conditions in an adaptive management framework for restoration.	Confidential Client	$30	2002
042, 073, 079, 097, 258	IE	5. **Poplar Island Restoration and Other Chesapeake Bay Projects, Maryland** – Provided project management for the wetlands and hydraulic planning aspects of the Poplar Island Restoration project. This project involved restoration of over 1,100 acres of wetlands and upland habitats in Chesapeake Bay using dredged material from the Port of Baltimore's shipping channels. BBL staff were also involved in design, planning, and operational studies for several other island/CDF projects in the bay, including the Upper Bay Islands Study.	Maryland Port Administration One Maritime Center 2310 Broening Highway Baltimore, MD 21224 Maryland Environmental Service 2011 Commerce Park Drive Annapolis, MD 21401	$150	2001

028, 033, 258, 262	IE	6. **Tabbs Creek Sediment and Aquatic and Wetland Sampling Program, Chesapeake Bay, Virginia** – BBL staff designed, managed, and implemented a comprehensive aquatic ecological investigation in support of an ecological risk assessment for contaminants in Tabbs Creek, a tidal tributary of the Back River in the lower Chesapeake Bay. The program included a fish seine investigation to collect multiple estuarine species, as well as a variety of trap and net sampling techniques for blue crab, shrimp, fish, and turtles. In addition, conducted detailed habitat surveys and wetlands delineation/assessment of the tidal marshes and surrounding areas. Also performed a sediment and water quality investigation. The results were used to construct a food web exposure model and assess the risks of contaminants in the creek to invertebrates, fish, and waterbirds, and to evaluate the likely risks to the tidal marsh system from various remedial options.	NASA	$75	1993
028, 033, 258, 262	IE	7. **Aquatic and Wetland Sampling Program, Nanticoke River, Chesapeake Bay, Virginia** – BBL staff implemented an ecological risk assessment for contaminated sediments and biota at the Navy Drive Facility on the Nanticoke River in southern Virginia. Performed ecological investigations of the tidal marsh habitats adjacent to the facility. These included fish and blue crab sampling using a variety of trap and net sampling techniques, wetlands delineation/assessment, habitat characterization, and sediment and water quality sampling and analysis. The results were used to characterize the ecology of the site and to assess risks to aquatic organisms (i.e., benthic invertebrates, blue crab, fish, and birds) from contaminants at the facility.	United States Navy	$50	1992
028, 033, 092, 262	P	8. **Ecological Investigation, Alabama** – Characterized floodplain habitat types, including wildlife corridors and "edge" habitats, in the floodplain of a large creek in Alabama. Using GPS, established transects in the floodplain that were perpendicular to the creek for surveying during two seasons of high and low water. Identified species of groundcover, understory, and canopy vegetation and observed wildlife by sight or sign (browse, day beds, scat, etc.). Developed data base of vegetation and wildlife information and used this to ground truth aerial photography of floodplain along 39 miles of the creek. This information was used to support exposure assumptions for a detailed ecological risk assessment.	Confidential Client	$500	2003
028, 033, 079, 092, 102, 258, 262, 266	P	9. **Lake Okeechobee Sediment Management Services, Florida** – Provided sediment management support services related to organics and inorganics in 730 square miles of Lake Okeechobee since January 2000. Work has included: development of goals and performance measures; public and interagency outreach plans and meetings; evaluation of physical and chemical sediment data; feasibility study (to evaluate dredging, capping, and other technologies) and beneficial reuse of both treated waters and remaining solids; sediment fate and transport modeling; and coordination with USACE, USFWC, and the state.	South Florida Water Management District 3301 Gun Club Road West Palm Beach, Florida 33416	$955	2003
033, 042, 073, 097, 262	P	10. **Sharps Island Restoration, Maryland** – Conducted pre-feasibility study evaluations to assess restoration options of Sharps Island using dredged material from the Port of Baltimore. The work involved consideration of environmental, geotechnical, coastal, and dredging aspects, including CDF design elements.	Maryland Environmental Service 2011 Commerce Park Drive Annapolis, MD 21401	$68	2002

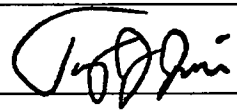
028, 033, 037, 262	IE	11. **Environmental Impact Assessment for Davids Island Redevelopment Project, Long Island Sound, New York** – BBL staff managed and implemented a comprehensive aquatic ecological investigation to collect sufficient data to assess the environmental impacts from a proposed redevelopment of a former military island in Long Island Sound. The proposal included plans for the construction of an 800 slip marina, which would have required deepening of 17 acres of intertidal habitat. Ecological investigations included fisheries surveys (trawl and seine studies), benthic invertebrate surveys, plankton and algae investigations, delineation of a rare mussel bar habitat, and quantification of primary (algal) production on various substrates and at various depths surrounding the island. These data were used to support a feasibility study for the redevelopment project.	Confidential	$300	1992
028, 033, 204, 258	P	12. **Wetlands and Terrestrial Ecology Investigation, New York** – Performed extensive surveys of terrestrial vertebrates, macroinvertebrates, and wetland plant communities as part of an ecological investigation at a CERCLA site. Assessment of vegetative communities at the site included wetlands delineation and an evaluation of wetlands function and value in accordance with the USACE Wetlands Delineation Manual and Wetlands Evaluation Technique (WET). Study results successfully documented the limited impact to terrestrial small mammal, soil macroinvertebrate, and vegetative communities at the site, which reduced the size of the potential remediation area from 150 to 8 acres.	Confidential Client	$100	1995
028, 211, 258	P	13. **Ecological Investigation, Puerto Rico** – Designed and implemented an ecological assessment in association with RI/FS activities at a 100-acre site. The site included active manufacturing areas, subtropical moist forest areas, and mangrove swamps. Activities included habitat quality assessments, receptor species identification, and wetlands delineation. Information obtained in these investigations was used to develop a conceptual site model, including identification of potential ecological receptors and areas of potential concern for a subsequent ecological risk assessment.	Confidential Client	$60	2001
262, 028	P	14. **Benthic Invertebrate and Fish Community Assessment, Ohio** – Conducted a RCRA Facility Investigation (RFI) in response to a discharge of organic solvents to a nearby stream using USEPA Rapid Bioassessment Protocols (RBP). Work involved determining fish and benthic invertebrate community structure (e.g. species composition, abundance, diversity) both upstream and downstream of the release. The study concluded that stream ecology was not adversely affected by the release and that no additional investigation or remediation was necessary.	Safety Kleen Hebron, OH	$25	1991
262, 028, 033	P	15. **Aquatic Habitat Surveys and Benthic Invertebrate Community Surveys, New York** – Conducted aquatic habitat surveys and benthic community surveys in a pilot study area. The habitat surveys included characterizing epifaunal substrate and available in-stream cover, as well as bank vegetation and stability and cover-type composition of the riparian zone. Benthic community evaluations included multiple dredge and artificial substrate samples from locations upstream and downstream of a pilot dredging project. The study indicated that habitat quality and substrate characteristics affected the diversity, abundance, and distribution of aquatic biota in the river.	Confidential Client	$40	2002

262, 037	P	16. **Fish Population Study** – Conducted a study to determine if sediment and water column contaminants had a discernible effect on fish population density at a riverine Superfund site. Fish population sizes were estimated using repeated electrofishing passes and depletion estimation techniques. Results of the study showed that sportfish population densities were similar to or greater than reference sites and that levels of sediment contamination were having no significant impact on fish population density.	Confidential Client	$25	1994
262, 037	P	17. **Riverine Fish Monitoring Program, Wisconsin** – Designed and implemented a multi-year migratory salmonid fish monitoring program. The study involved measuring PCB levels in edible portions of migratory sport fish at the site and reference locations. The study demonstrated that fish in the river had tissue residues that were no greater than those observed in reference locations, probably due to the relatively short duration of river residence for these migratory species. As a result of this study, an existing agency prohibition on salmonid stocking was revisited and led to resuming the salmon stocking program.	Confidential Client	$70	1994
262, 211	P	18. **Aquatic Biota Tissue Monitoring Program, Puerto Rico** – Designed and implemented an aquatic tissue residue monitoring program in an estuarine environment adjacent to a coastal industrial facility. The program developed data to assess the extent of biological uptake of constituents associated with the facility's effluent discharges and general surface runoff from the site. Target species included edible-size fish (tarpon, snapper), forage fish, and crabs. Constituents included pesticides, metals, PCBs, and PAHs. Results demonstrated no significant tissue accumulation of these constituents attributable to the facility.	Confidential Client	$40	2001
262, 255	JV	19. **Aquatic Biological Sampling Program, Fox River, Wisconsin** – Implemented an extensive fish and aquatic biota (snapping turtles, crayfish, and benthic invertebrates) sampling program to assess potential natural resource injuries and environmental and human health risks from sediment PCBs. The fish sampling activities included nine fish species in 15 locations throughout a 30-mile reach of the river and 25-mile stretch of Green Bay. BBL staff designed and provided oversight for side-scan sonar investigations, benthic invertebrate community surveys, and habitat and vegetation mapping.	Fox River PRP Group Wisconsin	$60	1998
033, 204	P	20. **Mercury Tissue Residue Monitoring Program, Alabama** – Implemented a mercury tissue residue monitoring program in areas adjacent to an active manufacturing facility. Target species included frogs and snakes. Data were used to identify areas where mercury uptake was occurring in terrestrial biota and to provide baseline information for subsequent evaluation of the effectiveness of site remediation at reducing mercury uptake.	Alcoa Mobile, AL	$30	2001
028	P	21. **Threatened and Endangered Species Surveys, Florida** – Performed a systematic transect survey of gopher tortoise burrows at an industrial site. Gopher tortoise burrows were located, and this information was used to modify proposed development plans to minimize impacts on the tortoises. A plan was also prepared to relocate tortoises from areas that were planned for future development.	Confidential Client	$20	1997

028	P	22. **Terrestrial Habitat Characterization and Wetlands Mitigation, New York** – Conducted a wetlands assessment and prepared a wetlands restoration plan for a former manufactured gas plant (MGP) site. The project involved designing the restoration of emergent, scrub-shrub, and forested wetlands that would be affected by site remediation. The restoration plan identified replacement soils and appropriate seed mixes, shrubs, and trees. A monitoring plan was developed to document progress of the restored wetlands and to implement adaptive management techniques to ensure wetlands progress toward established success criteria. In addition, to address landowner concerns related to mature trees that might be affected by site remediation, BBL inventoried and evaluated these trees and developed property-specific programs to replace trees and/or compensate landowners.	Confidential Client	$25	2002
258	P	23. **Wetlands Assessment and Mitigation Plan, New York** – Designed and implemented a wetlands mitigation plan to compensate for wetlands and tributary impacts resulting from site remediation. The work included wetlands delineation and permitting, as well as preparing a wetlands restoration plan. Restoration activities included replacing excavated soils to original grades and planting native wetlands vegetation. Mitigation for the lost ponded wetlands involved creating scrub-shrub and herbaceous emergent wetlands at a 1:1 mitigation ratio of impacted acreage to created acreage. To maximize efficiency, the design used upland areas adjacent to existing wetlands to create one contiguous wetlands of varying wetlands types.	Niagara Mohawk Power Corporation Syracuse, NY	$20	1998
028, 262	P	24. **Sediment Quality Triad Study, Illinois** – Performing a sediment quality triad study to assess potential ecological impacts associated with an industrial facility adjacent to a major river in Illinois. The triad methodology involves collection and evaluation of data concerning sediment chemical constituents, benthic community structure, and sediment toxicity. The various data are being evaluated to provide an overall assessment of sediment quality to determine the extent of impact. Triad data are being used to identify sediment areas for potential remediation and to develop preliminary cleanup objectives.	Confidential Client	$40	2003
033	P	25. **Annual Fish Monitoring Program, Southeastern River** – Designed and implemented a resident fish tissue residue monitoring program in a 60-mile stretch of river to assess potential human exposure to PCBs via fish consumption. About 100 fillet samples representing five different taxonomic/ecological categories of fish are collected annually from various locations using electrofishing equipment, gill nets, and trap nets. Data are used to monitor temporal trends in fish PCB levels and to assess the appropriateness of existing fish consumption advisories.	Confidential Client	$500	Ongoing
033	P	26. **Aquatic Ecological Monitoring Program, New York** – As part of a remedial investigation, obtained tissue residue samples from a variety of aquatic species in surface water drainage pathways associated with a former landfill Superfund site. Species included forage fish (minnows, juvenile sunfish), sport fish (bass, brook trout) and macroinvertebrates (crayfish). Sampling locations included headwater streams, larger streams, ponds, and impoundments. Biota were captured using nets, traps, and electrofishing. Data from this study were used to identify areas affected by landfill constituents, and to target those areas for further investigation and/or remediation.	Confidential Client	$50	1993

033, 042, 073, 097, 262	P	27. **Aberdeen Proving Ground (APG) Investigation, Maryland** – Conducted pre-feasibility study evaluations to assess the potential remediation of select waterside APG locations using dredged material from the Port of Baltimore. The work involved consideration of environmental, geotechnical, coastal, and dredging aspects.	Maryland Environmental Service 2011 Commerce Park Drive Annapolis, MD 21401	$125 (contract being executed)	2002
028, 033, 037, 092, 114	P	28. **Biological Characterization and Modeling Assessment, New York** – Developed and performed an environmental study to model potential accumulation of chemicals through the food web and potential effects on biological resources of a lake and other surface waters. Developed a chemical dynamic-rate-constant (fugacity) model for a lake with PCB-containing sediments. Estimated flux across sediment/water and water/air interfaces. Developed estimates of surface water transport into and out of the lake. Used modeling to assess the effects of past and proposed upstream remedial activities. The project included dietary studies and analysis of fish stomach contents and the collection and analysis of fish and invertebrates.	Confidential Client	$100	1997
033, 114, 258	P	29. **Wetlands Mitigation, New York** – Conducted a wetlands assessment and prepared a wetlands restoration plan for an 80-acre former MGP site. Developed a wetlands monitoring plan and implemented adaptive management techniques to provide for wetlands progress toward established success criteria.	Niagara Mohawk Power Corp. 300 Erie Blvd. West Syracuse, NY 13202	$20	2002
258, 028	P	30. **Ecological Investigation at a CERCLA Site, USEPA Region 4** – Performed an ecological investigation as part of RI/FS activities at a former pesticide facility CERCLA site. Upland and wetlands ecological communities were classified based on vegetative species assemblages and structure. A wetlands functional assessment was performed using the USACE WET to identify principal wetlands functions and values. The results were used to develop a conceptual site model and focus the subsequent ecological risk assessment on specific ecological receptor species and communities.	Confidential Client	$20	2002

12. The foregoing is a statement of facts.

Signature:	Typed Named and Title:	Date:
	Timothy J. Iannuzzi, Principal Ecologist	2/05/03

Experience Profile Code Numbers for Use with Questions 10 and 11

001 Acoustics; Noise Abatement
002 Aerial Photogrammetry
003 Agricultural Development; Grain Storage; Farm Mechanization
004 Air Pollution Control
005 Airports; Navaids; Airport Lighting; Aircraft Fueling
006 Airports; Terminals & Hangars; Freight Handling
007 Arctic Facilities
008 Auditoriums & Theaters
009 Automation; Controls; Instrumentation
010 Barracks; Dormitories
011 Bridges
012 Cemeteries *(Planning & Relocation)*
013 Chemical Processing & Storage
014 Churches; Chapels
015 Codes; Standards; Ordinances
016 Cold Storage; Refrigeration; Fast Freeze
017 Commercial Building *(Low Rise)*; Shopping Centers
018 Communications Systems; TV; Microwave
019 Computer Facilities; Computer Service
020 Conservation and Resource Management
021 Construction Management
022 Corrosion Control; Cathodic Protection; Electrolysis
023 Cost Estimating
024 Dams *(Concrete; Arch)*
025 Dams *(Earth; Rock)*; Dikes; Levees
026 Desalinization *(Process & Facilities)*
027 Dining Halls; Clubs; Restaurants
028 Ecological & Archeological Investigations
029 Educational Facilities; Classrooms
030 Electronics
031 Elevators; Escalators; People-Movers
032 Energy Conservation; New Energy Sources
033 Environmental Impact Studies, Assessments, or Statements
034 Fallout Shelters; Blast-Resistant Design
035 Field Houses; Gyms; Stadiums
036 Fire Protection
037 Fisheries; Fish Ladders
038 Forestry & Forest Products
039 Garages; Vehicle Maintenance Facilities; Parking Decks
040 Gas Systems (Propane; Natural; Etc.)
041 Graphic Design
042 Harbors; Jetties; Piers, Ship Terminal Facilities
043 Heating; Ventilating; Air Conditioning
044 Health Systems Planning
045 Highrise; Air-Rights-Type Buildings
046 Highways; Streets; Airfield Paving; Parking Lots
047 Historical Preservation
048 Hospital & Medical Facilities
049 Hotels; Models
050 Housing *(Residential, Multi-Family; Apartments; Condominiums)*
051 Hydraulics & Pneumatics
052 Industrial Buildings; Manufacturing Plants
053 Industrial Processes; Quality Control
054 Industrial Waste Treatment
055 Interior Design; Space Planning
056 Irrigation; Drainage
057 Judicial and Courtroom Facilities
058 Laboratories; Medical Research Facilities
059 Landscape Architecture
060 Libraries; Museums; Galleries
061 Lighting *(Interiors; Display; Theater; Etc.)*
062 Lighting *(Exteriors; Streets; Memorials; Athletic Fields; Etc.)*
063 Materials Handling Systems; Conveyors; Sorters
064 Metallurgy
065 Microclimatology; Tropical Engineering
066 Military Design Standards
067 Mining & Mineralogy
068 Missile Facilities *(Silos; Fuels; Transport)*
069 Modular Systems Design; Pre-Fabricated Structures or Components
070 Naval Architecture; Off-Shore Platforms
071 Nuclear Facilities; Nuclear Shielding
072 Office Buildings; Industrial Parks
073 Oceanographic Engineering
074 Ordnance; Munitions; Special Weapons
075 Petroleum Exploration; Refining
076 Petroleum and Fuel *(Storage and Distribution)*
077 Pipelines *(Cross-County - Liquid & Gas)*
078 Planning *(Community; Regional; Area-Wide; and State)*
079 Planning *(Site; Installation; and Project)*
080 Plumbing & Piping Design
081 Pneumatic Structures; Air-Support Buildings
082 Postal Facilities
083 Power Generation; Transmission; Distribution
084 Prisons & Correctional Facilities
085 Product; Machine & Equipment Design
086 Radar; Sonar; Radio & Radar Telescopes
087 Railroad; Rapid Transit
088 Recreation Facilities *(Parks; Marinas; Etc.)*
089 Rehabilitation *(Buildings; Structures; Facilities)*
090 Resource Recovery; Recycling
091 Radio Frequency Systems & Shieldings
092 Rivers; Canals; Waterways; Flood Control
093 Safety Engineering; Accident Studies; OSHA Studies
094 Security Systems; Intruder & Smoke Detection
095 Seismic Designs & Studies
096 Sewage Collection; Treatment & Disposal
097 Soils & Geologic Studies; Foundations
098 Solar Energy Utilization
099 Solid Wastes; Incineration; Landfill
100 Special Environments; Clean Rooms; Etc.
101 Structural Design; Special Structures
102 Surveying; Platting; Mapping; Flood Plain Studies
103 Swimming Pools
104 Stormwater Handling & Facilities
105 Telephone Systems (Rural; Mobile; Intercom; Etc.)
106 Testing & Inspection Services
107 Traffic & Transportation Engineering
108 Towers (Self-Supporting & Guyed Systems)
109 Tunnels & Subways
110 Urban Renewals; Community Development
111 Utilities (Gas & Steam)
112 Value Analysis; Life-Cycle Costing
113 Warehouses & Depots
114 Water Resources; Hydrology; Groundwater
115 Water Supply; Treatment; and Distribution
116 Wind Tunnels; Research/Testing Facilities Design
117 Zoning; Land Use Studies

Supplemental Experience Profile Code Numbers for Use with Questions 10 and 11

Code	Description
200	Air Traffic Control Planning
202	Airborne Sensing Radiation/Magnetics
203	Animal Shelters
204	Animal Testing
205	Appraisals, Rate Studies
262	Aquatic Biology
206	Architectural Consultation/Surveys
281	Asbestos Abatement
207	Audio-Visual Aids, Brochures, Charts
208	Bio-Medical Engineering
272	CAD (Computer-Aided Design)
273	CADD (Computer-Aided Design & Drafting)
271	Child Care Centers
209	Civic Buildings, Community Centers
210	Climatological Studies
211	Coastal Engineering/Studies
212	Color Separation
213	Contract Administration/Claims Analysis
269	Design-Build
261	Design for Handicapped Accessibility
214	Diving Surveys - Construction
215	Dredging
216	Dredging Surveys
217	Drilling and Completion of Wells
218	Economic Impact & Feasibility Studies
277	Electric Magnetic Fields
219	Electrical Design/Studies
220	Engineering Consultations and Reports
276	Environmental Protection
282	Environmental Services & Engineering
221	Environmental Testing and Analysis
222	Equipment Rental
223	Ferry Terminals and Transfer Bridges
224	Finance
270	Financial Establishments (Banks)
283	Geographic Information Systems (GIS)
225	Geophysical Service
278	Global Positioning Systems (GPS)
280	Graphic Art
266	Hazardous Waste Management
226	Historic Monuments & Memorials
275	Indefinite Delivery Contracts
227	Industrial Design
267	Infrared Surveys
229	Investigation of Failures
230	Lake Habilitation and Management
231	Land Subdivision and Development
232	Laser Systems Development
233	Lashings and Securing Systems
234	Legal
235	Management
236	Marine Biology
237	Market Analysis/Research
238	Mathematical Modeling
259	Microbiological Analysis
239	Military Facilities, Armory
201	Military Terrain Analysis
240	Mine Drainage
241	Mobile Home Development
242	Model Construction
243	Municipal Engineering
244	Observatory
245	Photogrammetry
246	Planetarium
268	Plant Operation
247	Powerhouse Building Design
248	Prestressed Concrete
249	Procurement
264	Project & Public Security Planning & Design
250	Public Relations
279	Remote Sensing
251	Research and Development
265	Roofing Consultant Services
252	Socio-Economic Studies
253	Technology Assessment
254	Technology Transfer
255	Toxicology & Hazardous Materials
256	Training
274	Underground Storage Tanks
257	Value Engineering
260	Weather Forecasting
258	Wetlands

Section 2

Standard Form 255

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

consultants with focus

STANDARD FORM (SF) **255** ARCHITECT-ENGINEER AND RELATED SERVICES QUESTIONNAIRE FOR SPECIFIC PROJECT	1. **Project Name/Location for Which Firm is Filing:** Maryland Environmental Service RFP # 03-07-22 Feasibility-Level Environmental Conditions Studies for a Potential Island Restoration Project at Barren Island Dorchester County, MD	2a. ***Commerce Business Daily*** **Announcement Date, if any:**	2b. **Agency Identification Number, if any** RFP # 03-07-22

3. **Firm (or Joint-Venture) Name & Address**	3a. **Name, Title, and Telephone Number of Principal to Contact**
Blasland, Bouck & Lee, Inc. 326 First Street, Suite 200 Annapolis, MD 21403-2678	Timothy J. Iannuzzi, Principal Ecologist (410) 295-1205 David F. Ludwig, Ph.D., Principal Scientist (410) 295-1205
	3b. **Address of Office to Perform Work, if Different from Item 3**

4. **Personnel by Discipline:** *(List each person only once, by primary function.)* Enter proposed consultant personnel *to be utilized* on this project on line (A) and in-house personnel on line (B).

(A)	(B) 160	Administrative	(A)	(B) 1	Electrical Engineers	(A)	(B) 0	Oceanographers	(A)	(B) 21	Toxicologists
(A)	(B) 0	Architects	(A)	(B) *	Estimators	(A)	(B) 1	Planners: Urban/Regional	(A)	(B) 5	Atmospheric Scientists
(A)	(B) 16	Chemical Engineers	(A)	(B) 57	Geologists	(A)	(B) 23	Sanitary Engineers	(A)	(B) 52	Environmental Engineers
(A)	(B) 49	Civil Engineers	(A)	(B) 18	Hydrologists	(A)	(B) 17	Soils Engineers	(A)	(B) 10	Chemists
(A)	(B) 28	Construction Inspectors	(A)	(B) 0	Interior Designers	(A)	(B) *	Specification Writers	(A)	(B) 61	Technicians
(A)	(B) 25	Draftsmen	(A)	(B) 2	Landscape Architects	(A)	(B) 3	Structural Engineers	(A)	(B) 69	Environmental Scientists
(A)	(B) 23	Ecologists	(A)	(B) 3	Mechanical Engineers	(A)	(B) 4	Surveyors	(A)	(B) 3	Industrial Hygienists
(A)	(B) 20	Economists	(A)	(B) 0	Mining Engineers	(A)	(B) 0	Transportation Engineers	(A)	(B) 6	Coastal Engineers
									(A)	(B) 677	Total Personnel

5. **If submittal is by JOINT-VENTURE, list participating firm and outline specific areas of responsibility** (including administrative, technical, and financial) for each firm: *(Attach SP254 for each, if not on file with Procuring Office.)*

5a. **Has this Joint-Venture previous worked together?** [ ] Yes [ ] No

6. If respondent is not a joint-venture, list outside key consultants/associates anticipated for this project (attach SF 254 for consultants/associates listed, if not already on file with the contracting office).			
NO.	NAME AND ADDRESS	SPECIALTY	WORKED WITH PRIME BEFORE (YES OR NO)
1.	Normandeau Associates, Inc. 3450 Schuylkill Road Spring City, PA 19475-1124	Biological Laboratory Analysis	YES
2.	Air, Water & Soil Laboratories, Inc. 2109A North Hamilton Street Richmond, VA 23230 Minority Business Enterprise	Water Quality Laboratory Analysis	NO
3.	E2CR, Inc. 9004 Yellow Brick Road, Suite E Baltimore, MD 21237 Minority Business Enterprise	Geotechnical Engineering	YES *
4.			
5.			

* Senior staff from BBL and this firm have collaborated on projects while with previous employers.

Organization Chart

Barren Island Environmental Conditions Study
MES Contract No. 03-07-22

Maryland Environmental Service

Principal-In-Charge / Project Manager
Timothy J. Iannuzzi (BBL)

Project Advisors
David F. Ludwig, Ph.D. (BBL)
Joseph K. Shisler, Ph.D. (BBL)
Ram K. Mohan, Ph.D. (BBL)

BBL Team Key Staff

Field Studies Task Leader	Biological Laboratory Task Leader	Water/Sediment Quality Laboratory Task Leader	Environmental Conditions Report Task Leader
David J. Buys (BBL)	Robert J. Helmers (NA) Joseph N. Strube (NA)	Carmela L. Tombes (AWS)	John B. Thelen (BBL)

Support Personnel

Scott Larew (BBL) - Field EcologyServices
E.J. Suardini (BBL) - Field Ecology Services
Stephen Truchon (BBL) - Senior Benthic/Fisheries Ecologist
Timothy Donegan (BBL) - Senior Engineer/Island Restoration Specialist
Anthony Esposito (BBL) - Senior Wetland/Terrestrial Ecologist
Silva Balu, P.E. (E2CR) - Senior Geotechnical Engineer

BBL = Blasland, Bouck & Lee, Inc.
NA = Normandeau Associates, Inc.
AWS = Air, Water & Soil Laboratories, Inc. (MBE)
E2CR = E2CR, Inc. (MBE)

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** Timothy J. Iannuzzi, Principal Ecologist	d. **Years Experience:** 14 **With This Firm:** 3
b. **Project Assignment:** Principal-In-Charge / Project Manager	e. **Education (Degree/Year/Discipline):** MA/1990/Biology BS/1987/Biology AAS/1984/Natural Resource Conservation
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Iannuzzi, a Principal Ecologist with BBL, will serve as Principal-In-Charge/ Project Manager and will be the contact person for MES on all aspects of program management, contract management, and schedule issues. Mr. Iannuzzi is the Office Manager of BBL's Annapolis, MD office. He is a scientist with more than 14 years of research and consulting experience. His project work and management experience ranges from screening-level environmental assessments to large-scale risk assessments, natural resource damage assessments, and NEPA environmental impact evaluations. Mr. Iannuzzi's technical experience includes performing ecological investigations in marine/estuarine, freshwater, and wetland/terrestrial systems. This includes managing a number of large-scale field investigation programs. He has worked at a wide range of sites including many sediment management projects, more than 20 Superfund Sites, U.S. Department of Defense facilities, the U.S. Department of Energy Savannah River Facility, industrial manufacturing facilities, and RCRA sites. He specializes in investigating the effects of urbanization and industrialization on aquatic systems, and conducting risk based evaluation of the effects of chemical contaminants on environmental receptors.

Project Experience

Managing an RI/FS risk assessment for sediment contamination in the lower Passaic River, a large Superfund site located in the New York/New Jersey Harbor Estuary. Participating in regulatory negotiations, designing and implementing work plans and field sampling investigations, managing budgets and personnel, and providing technical oversight. Contaminants of concern include PCDD/PCDFs, PCBs, PAHs, pesticides, and metals. Conducted preliminary human health and ecological risk characterization, sediment toxicity assessments, ecological field investigations, combined sewer investigations, and chemical fingerprinting evaluations. Prepared peer-reviewed manuscripts for applicable work assignments.

Managed an RI/FS ecological risk assessment for the NASA Langley Research Center in Hampton, Virginia. Conducted quantitative fisheries and wildlife surveys, multimedia exposure analyses, sediment bioassays, bioaccumulation and analyses, and probabilistic food-web modeling to calculate site-specific cleanup goals for PCBs/PCTs in the sediments of Tabbs Creek, a polyhaline tidal tributary to the Back River in the lower Chesapeake Bay.

Managing an NRDA for injuries and reductions in ecological and health services associated with PCB contamination in the Lower Fox River and Green Bay, Wisconsin. Evaluating potential restoration projects to restore lost services. Managed field investigations to support the NRDA and ecological risk assessment, including fisheries, benthic invertebrate, and habitat surveys.

Managed an RI/FS risk assessment and evaluation of NRDA liabilities for a former pesticide manufacturing facility in Brunswick, Georgia. Designed and implemented field investigations regarding the likely bioavailability and effects of toxaphene in an estuarine system. Conducted habitat assessments and ecological characterizations of the site.

Managed ecological risk assessment activities and provided technical oversight at the U.S. DOE Savannah River Site, in Aiken, South Carolina, for Westinghouse Savannah River Company. Developed and reviewed technical work plans to conduct ecological assessments at more than 150 locations on the site, conducted assessments at assigned locations, and trained company personnel in ecological assessment methods. Designed and presented a workshop on the regulatory framework and methods for conducting ecological risk assessments.

Managed the Davids Island development project in Western Long Island Sound. Evaluated the impacts of dredging and construction of an 800-slip marina and associated breakwater on benthic primary and secondary production in intertidal and subtidal habitats. Conducted aquatic ecological field investigations.

Managed environmental risk assessments associated with PCB contamination in waterways in and around Bloomington, Indiana. Designed and implemented work plans and field sampling investigations, assisted with regulatory negotiations, developed health-based cleanup goals for PCBs, and conducted risk-based evaluations of remedial alternatives. Designed and conducted a large-scale field sampling plan to evaluate the bioaccumulation and hypothetical risks of PCBs to human and wildlife receptors via fish ingestion from a contaminated creek.

7. **Brief resume of key persons, specialists, and individual consultants anticipated for this project.**	
a. **Name & Title:** David F. Ludwig, Ph.D., Principal Scientist	d. **Years Experience:** 21 **With This Firm:** 3
b. **Project Assignment:** Project Advisor	e. **Education (Degree/Year/Discipline):** Ph.D./1985/Systems Ecology MA/1982/Aquatic Sediment Ecosystems BS/1976/Environmental Science
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Dr. Ludwig is an ecologist with 21 years of experience innovating cost-effective, protective solutions to natural resource damage assessment (NRDA), ecological risk assessment, ecotoxicology, and environmental management problems. Dr. Ludwig is trained in systems ecology, marine/estuarine ecosystems and invertebrate ecology. He has managed diverse environmental programs, in both the continental United States and overseas, ranging from focused specialty tasks addressing single technical issues to complex, multidisciplinary programs exceeding $1 million. Dr. Ludwig has implemented many field and laboratory investigations addressing potential natural resource damages (NRDs), and ecological effects of organic and inorganic chemicals in aquatic and terrestrial environments. He has supervised the development of successful data analysis applications using statistical tools, transport and fate analyses, modeling techniques, and exposure projection to support private sector clients facing numerous regulatory and legal challenges.

Dr. Ludwig is a skilled negotiator, with experience in nearly all USEPA regions and numerous states, and he has worked with industrial clients developing effective strategies and implementing tactics under various regulatory programs. In recent years, he has specialized in natural resource damage assessment (NRDA), working with clients on damage claims arising from federal (NOAA, USFWS, and DOD) and state (Colorado, New Mexico, Texas, Alabama, Louisiana, Wisconsin, Washington, California, New Jersey, Ohio, North Carolina, and others) trustees. He has supported legal counsel for hazardous site projects, wetlands issues, air and water discharges, and NRDA activities throughout the United States, including the Fox River in Wisconsin; a major NPL site in the Hackensack Meadowlands of New Jersey; a number of sites throughout New Mexico; a major NPL site in Ohio; a major estuary in Louisiana; Elliot Bay in Seattle, Washington; the California Bight off the Los Angeles coast; a major NPL site in the Rocky Mountain region; and the Mobile River basin of Alabama. Dr. Ludwig has significant overseas experience in the Virgin Islands, Bermuda, Guam, China, and the Middle East. He is a recognized expert in applying risk assessment findings to management decisions.

Project Experience

Serving as Principal-In-Charge for an NRDA program for the lower Fox River and Green Bay, WI, Mr. Ludwig is responsible for technical oversight, strategy, and key agency negotiations towards settlement of the NRD claim.

Managing an NRDA program for an industrial client at a major estuary in western Louisiana. Program includes establishing baseline ecological conditions, identifying and quantifying sources of ecosystem stresses, and estimating effects of various stress orders.

For outside counsel, conducted a preliminary NRDA liability analysis for a confidential client in New Mexico. Resources and services at issue include terrestrial and aquatic habitats, water and sediment quality, groundwater, wildlife, and endangered species.

Managing NRD activities and the ecological risk assessment at the Fields Brook NPL site in the Great Lakes region. Supervised team developing and implementing methods for hazard and exposure analysis. Developed effective exposure modeling and risk quantitation methods for mercury, PCBs, chlorinated hydrocarbons, and other metals, including lead, cadmium, and arsenic. Developed and negotiated risk management alternatives and developed strategy for NRD settlement and ultimate systems.

Managed NRD activities in the Mobile River basin, Alabama, on behalf of a PRP consortium. Directed the team conducting oversight of trustee field and laboratory activities. Reviewed trustee and USEPA reports documenting findings and projecting future activities. NRD and CERCLA actions relating to these trustee investigations were successfully halted.

Provided expert analysis and opinion regarding NRDs resulting from a high-seas oil release off the Azores.

Managed an ecological risk assessment for the Bayou Trepagnier site in the Gulf Coast region. Coordinated data collection and analysis by contractors and academic researchers and directed risk assessment components of a remedial investigation report. Prepared balanced evaluation of potential effects of PAHs, lead, and other metals on aquatic and terrestrial ecosystems.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** Joseph K. Shisler, Ph.D., Principal Scientist	d. **Years Experience:** 30+ **With This Firm:** 2
b. **Project Assignment:** Project Advisor	e. **Education (Degree/Year/Discipline):** Ph.D./1975/Zoology MA/1970/Environmental Education BS/1965/Biology
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):** Professional Wetland Scientist / Senior Ecologist

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

A nationally recognized wetlands expert, Dr. Shisler has more than 30 years of experience in the area of wetlands management. He is the former president of Shisler Environmental Consultants, Inc. in Perrineville, New Jersey and was formerly at Rutgers University for more than 15 years where he directed research on the management of wetlands, stormwater management, and wetland mitigation. Dr. Shisler has been a consultant to various state, federal, and international agencies concerning wetlands and stormwater management issues, and he has published more than 125 papers on the subject. Dr. Shisler's work was recognized by the New Jersey Wildlife Society, who presented him with the 1980 Conservationist of the Year award. Dr. Shisler evaluated the wetlands on Staten Island for the New York Department of Environmental Conservation (NYSDEC). Governor Kean appointed him chairperson of the New Jersey Wetlands Mitigation Council in 1989. Dr. Shisler is a certified Professional Wetland Scientist by the Society of Wetland Scientists and Senior Ecologist by the Ecological Society of America.

Project Experience

In association with the project engineers for the contamination cleanup at a confidential site in Georgia, acted as the wetland consultant for mitigation of wetlands impacted for a remedial action. Work included jurisdictional delineation under the Clean Water Act, assisting in preparing a permit application, and implementing the project for the cleanup of approximately 0.5 miles of an intermittent stream corridor.

Evaluated more than 50 sites throughout New Jersey and surrounding states as potential sites. Necessary permits were obtained from CAFRA and the New Jersey Wetland Protection Act.

Working with the project engineers for the Kin-Buc Landfill Site, acted as the wetland consultant for mitigation of wetlands impacted by remedial action. Assisted in developing an approved Wetland Mitigation Plan for the site that involved innovative, adaptive management techniques for freshwater wetland creation and salt marsh restoration. Involved in negotiations with the NJDEP, USEPA, NOAA, and USFWS.

Retained by the Sharkey Landfill Agreement Group to address natural resource damages (NRDs) and wetland mitigation for this Superfund site. Worked with project engineers concerning various aspects of the remedial action. Involved in negotiations with the New Jersey Department of Environmental Protection (NJDEP), United States Environmental Protection Agency (USEPA), National Oceanic and Atmospheric Administration (NOAA), and the US Fish and Wildlife Service (USFWS).

Assisted in the design and construction of 3-acre salt marsh wetland mitigation project for Shell Oil Corporation.

In association with several engineering firms in the redevelopment of the AMAX Copper Site as Port Carteret, acted as the environmental consultant in obtaining the Waterfront Development Permits from the NJDEP.

Assisted in the Natural Resource Inventory and habitat evaluation for an ecological risk assessment at a former hazardous waste site. The work included obtaining a Letter of Interpretation and permits from the NJDEP.

Assisted the City of Perth Amboy engineer in preparing an environmental assessment to obtain a Waterfront Development Permit from the NJDEP for the expansion of the existing marina.

Wetland mitigation consultant for the construction of the Meadowlands Mills. The development required filling 206 acres of wetlands and restoring/enhancing 380 acres. Duties included the wetland mitigation design requirements and implementing the project.

Assisted in evaluating, designing, and constructing an oxbow to the Quinnipiac River as mitigation for wetlands impacted by NTCRA. This included negotiations with the Connecticut Department of Environmental Protection (CTDEP) and the USEPA. The wetland mitigation met the objectives set forth.

Assisted in the Natural Resource Inventory for a New Jersey Superfund Site by obtaining permits for the wetlands disturbance during remedial action.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** Ram K. Mohan, P.E., Ph.D., Principal Engineer	d. **Years Experience:** 15 **With This Firm:** 3.5
b. **Project Assignment:** Project Advisor	e. **Education (Degree/Year/Discipline):** Ph.D./1993/Coastal & Dredging Engineering MS/1990/Coastal & Marine Geotechnical Engineering BS/1988/Naval Architecture
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):** 1995/Professional Engineer, Maryland and South Carolina

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Dr. Mohan has more than 15 years of nationwide experience in dredging, dredged material management, contaminated sediments, marine geotechnical, coastal, and port engineering projects. He is a member of the prestigious National Research Council's Ocean Studies Board and is currently appointed on a congressional study to peer-review the USACE. He has national experience in dredging, dredged material management, CDF design, and contaminated sediments, including involvement in several projects for the MES/MPA, such as Upper Bay Islands, Hart Miller Island, CSX/Cox Creek, Poplar Island, Sharps Island, and Aberdeen Proving Ground. Dr. Mohan is the author of over 100 publications in civil, dredging, and coastal engineering.

Project Experience

Project Manager and Principal-in-Charge, Sharps Island Habitat Restoration Project, for Maryland Environmental Service. Project involves dredging and site engineering, cost analysis and environmental reconnaissance for restoration of a former island in Chesapeake Bay using dredged material from the Port of Baltimore. As part of the project, works with other consultants, Maryland Environmental Service, Maryland Port Administration, and the U.S. Army Corps of Engineers, Baltimore District.

Project Manager and Principal-in-Charge, Aberdeen Proving Ground Habitat Restoration Reconnaissance Project, for Maryland Environmental Service. Project involves dredging and site engineering, cost analysis and environmental reconnaissance for potential restoration of UXO-affected areas in Chesapeake Bay using dredged material from the Port of Baltimore. Works with Maryland Environmental Service, Maryland Port Administration, and the U.S. Army Corps of Engineers, Baltimore District.

Project Manager, Poplar Island Ecosystem Restoration Project – Hydraulics & Vegetation Development Planning for the Port of Baltimore, U.S. Army Corps of Engineers and Maryland Environmental Service. Managed and coordinated technical analysis of dredged material inflow planning, alternative analysis for marsh channeling, material elevations modeling, 2-dimensional hydrodynamic and sediment transport modeling of the functionality of channels and breaches, and development of vegetation planting guidance criteria.

Project Manager, CSX/Cox Creek Site Hydraulics Study for Maryland Environmental Service. Managed and coordinated development of various dredged material placement options, technical analysis of effluent quality, spillway design parameters, inflow patterns, and recommendations for reducing turbidity. Also served as the lead engineer for the site design (feasibility planning, alternative evaluation, engineering design of containment dikes, outfall structures and facilities, consolidation modeling, site capacity estimates, and economic analysis).

Project Manager, Hart Miller Island Site Hydraulics Study for Maryland Environmental Service. Managed and coordinated technical review of spillway design, analysis of material settling patterns and resulting effluent quality, and development of empirical relationships of total suspended solids and site operational parameters. The results from the study were used to develop a site operations plan for the island.

Project Manager, Review of the U.S. Army Corps of Engineers Philadelphia District Planning Study for the Chesapeake & Delaware Canal Deepening Project. Managed technical review of the navigation channel deepening (including channel design and shoaling analysis) and non-safety improvement design for the Port of Baltimore. Reviewed project alternatives from economic and environmental feasibility perspectives and suggested plan modifications.

Project Manager, Upper Chesapeake Bay Containment Island Planning Study for the Maryland Port Administration. Managed and coordinated planning and design efforts (including alternative development, economic and environmental analysis, and alternative screening) with Maryland Port Administration, three other consultants, state and federal agencies, resource agencies, and environmental groups. Work included design of containment dikes, outfall structures and facilities, consolidation modeling and site capacity estimates, and cost analysis of various options. Also, performed a peer review of the 3-D hydrodynamic modeling (CH3D) performed by the U.S. Army Waterways Experiment Station.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** David J. Buys, Project Scientist	d. **Years Experience:** 8 **With This Firm:** 5
b. **Project Assignment:** Field Studies Task Leader	e. **Education (Degree/Year/Discipline):** MS/1in progress/Aquatic Ecology BS/1995/Fish and Wildlife Management
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Buys has experience in aquatic bioaccumulation studies and biota sampling. He evaluates impacts to freshwater environments by monitoring trends in the diversity, abundance, and distribution of benthic macroinvertebrates. Past research efforts have focused on trout ecology and habitat management. He also provides technical assistance and direction in the laboratory and field, including management of personnel and equipment, surveys aquatic biota populations and associated habitats; designs and implements long-term field studies; provides statistical analyses and evaluation of data; researches scientific journals; and assists in writing reports, field sampling memoranda, and scientific collecting permits.

Project Experience

At the Fox River site in Green Bay, Wisconsin, supervised snapping turtle, crayfish, and fish trap-net sampling crews. Assisted in the collection of multiple fish species by electrofishing and benthic macroinvertebrates by Ekman dredge. Directed the deployment of macroinvertebrate Hester-Dendy artificial substrate samplers, including design of the sampling apparatus setup. Assisted and co-directed the deployment of mid-water-column fish cages as part of an in-situ bioaccumulation study.

At a confidential waterway in New York, assisted in the collection of young-of-year and adult fish, a fish marking program and movement study, and the sampling of caged mussels as part of an in-situ bioaccumulation study. Surveyed benthic macro-invertebrates using an Ekman dredge and Hester-Dendy artificial substrate samplers. In conjunction with the benthic study, sampled sediments for particle grain size and total organic carbon, completed a qualitative physical habitat characterization, and conducted water quality measurements.

For multiple benthic macroinvertebrate projects, supervised technical personnel in specimen processing, implemented QA/QC measures, and completed taxonomic identification at BBL's aquatic entomology laboratory. Analyzed benthic macro-invertebrate data using methods and procedures outlined in the USEPA's Rapid Bioassessment Protocols for Use in Streams and Rivers.

Directed and managed field sampling efforts to collect young-of-year and adult fish. Selected sampling gear appropriate for species-specific collections, including electrofishing, trap and gill nets, and trot lines. Processed all fish samples in the field, removing stomachs and bone structures (otoliths and spines) for diet content analyses and age identification, respectively. Used GPS technology to document data collection areas.

Other project-related work includes biota collections and surveys of fish, frogs, and/or benthic macroinvertebrates in Wisconsin (Crawford Creek), Michigan (Thunder Bay and Macon Creek), Massachusetts (confidential waterway), and New York (Cumberland Bay, St. Lawrence River, Station Lake Tributary and Breached Pond, and White and Wine Creeks). Further work in New York State includes plant identification for a wetland delineation in Pulaski, and habitat cover-type mapping and species identification as part of a Fish and Wildlife Impact Assessment (FWIA) for a site near Rochester.

Worked closely with University and Forest Service (USFS) personnel to complete multiple fisheries-related projects, including bioenergetics, competition, and aquaculture studies, stocking programs, and presence/absence surveys. As part of this work, managed and directed field sampling crews and maintained lab and field equipment. Conducted age and growth determinations by scale increment back-calculation, and executed behavioral observations and stomach contents analyses on fish. Quantified primary fish habitat variables through bathymetric and vegetation surveys. Completed water and soil chemistry analyses.

As part of master's thesis work, designed and implemented artificial stream-channel laboratory studies and fenced field-enclosure experiments to document the competitive interactions between two trout species. Surveyed aquatic habitat and headwater fish and macroinvertebrate populations. Researched and synthesized literature to form testable hypotheses to support proposals and pre-project presentations for peer review. Conducted statistical analyses and managed all data. Results of the study have management applications specific to trout habitat rehabilitation and the introduction of non-native species.

7.	Brief resume of key persons, specialists, and individual consultants anticipated for this project.		
a.	**Name & Title:** Robert J. Dancewicz-Helmers, Senior Taxomist	d.	**Years Experience:** 18 **With This Firm:** 17
b.	**Project Assignment:** Biological Laboratory Task Leader: Benthic Invertibrates/Zooplankton	e.	**Education (Degree/Year/Discipline):** BS/1985/Water Resources/Chemistry
c.	**Name of Firm With Which Associated:** Normandeau Associates, Inc.	f.	**Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Dancewicz Helmers has over 18 years of experience in aquatic biology, in both marine and freshwater environments. He provides assistance to clients seeking permits for activities in coastal waters. He also provides technical assistance, data analysis, and report writing. Mr. Dancewicz Helmers is also a senior taxonomist, specializing in invertebrates and phytoplankton.

Project Experience

US Generating Company (RI) (2000-Present) – Prepared permit applications and coordinated with state and federal agencies for dredging the plant intake canal. Collected sediment cores using vibracoring. Permit Assistance.

Public Service Company of New Hampshire (1989-Present) - Seabrook Environmental Studies. Author of the zooplankton section of report. Supervision of the macro-zooplankton, bivalve larvae and phytoplankton laboratory programs. Bivalve larvae, phytoplankton and zooplankton taxonomist. ReportAuthor/Taxonomist.

P.B. Power (MA) (2000) – Prepared summary water quality report for four reservoirs located on the Yadkin River in North Carolina. Report Author.

Missisquoi Bay Fisheries Study (VT) (2000) – Conducted fisheries field sampling including electrofishing, gill and trap nets, and angler surveys. Prepared interim report. Field Technician.

Hub Line (MA) (2000) Collected sediment cores in Salem Harbor. Field Technician.

Bridgeport Energy (CT) (2000) – Trained laboratory staff in the identification of zooplankton. Taxonomist.

City of Manchester Water Treatment Facility (NH) (2000) - Provided phytoplankton analysis for public drinking water reservoir. Project Manager/Taxonomist.

Gulf Oil Limited Partnership (MA) (1999-2000) – Prepared permit applications and coordinated with state and local agencies for shoreline and waterfront improvements at the Gulf Oil terminal in Chelsea Creek. Permitting Assistance.

Boston Harbor Navigation and Improvement Project (MA) (1999-2000) – Author of several reports relating to the disposal of dredged material, movement of the resulting turbidity plume and water quality in the Mystic River and Chelsea Creek. Performed field surveys of water quality paramaters, including dredge disposal plume location and water sampling. Report Author/Field Technician

Mallard's Landing Dredging Permit (NH) (1999) – Mapped shoreline, mooring area, beach and boat landing for lake association. Mapping included sediment characterization, bathymetry, and weed bed location. Field Technician.

Numerous Small Coastal Permitting Projects in Connecticut (CT) (1998-2000) – Provided assistance in obtaining state and federal permits for work in coastal waters. Applications included dredging and the placement, reconfiguration or retention of water related structures for a variety of clients including small marinas, waterfront dependent businesses and private landholders. Permit Assistance.

Numerous Benthic Sample Identifications (1998-2000) – Performed invertebrate taxonomy on numerous benthic samples collected from freshwater and marine sites located in NH, MA, RI and CT. Taxonomist.

Town of New Shoreham: Block Island Water Company (RI) (1997) - Provided phytoplankton analysis for public drinking water reservoir. Project Manager/ Taxonomist.

Great Northern Paper (ME) (1997) - Zooplankton and Phytoplankton analysis. Taxonomist.

Pfizer Entrainment (CT) Program (1997) - Bivalve larvae. Laboratory Supervisor/ Taxonomist.

Aqua Survey (NJ) Study (1997) - Zooplankton. Laboratory Supervisor/Taxonomist.

Hudson Station (NY) (1996-1997) - Monitoring Program for Hackensack River. Zooplankton. Laboratory Supervisor/Taxonomist.

Hackensack River (NY) - Hudson Station Macrozooplankton Program (1996-1997) - Laboratory Supervisor/Taxonomist.

7.	Brief resume of key persons, specialists, and individual consultants anticipated for this project.		
a.	**Name & Title:** Joseph N. Strube, Fishery Biologist/Senior Taxomist	d.	**Years Experience:** 26 **With This Firm:** 22
b.	**Project Assignment:** Biological Laboratory Task Leader: Ichthyoplankton	e.	**Education (Degree/Year/Discipline):** BS/1977/Fisheries Biology
c.	**Name of Firm With Which Associated:** Normandeau Associates, Inc.	f.	**Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Strube has 26 years of experience in fisheries-related work. In addition to his expertise in fisheries field studies, ichthyoplankton, and juvenile fish taxonomy, Mr. Strube is also experienced in marine and freshwater zooplankton taxonomy and has had extensive experience with all types of fishery sampling gear. Mr. Strube's other responsibilities include project management, supervision of field and laboratory personnel, and quality control procedures.

Project Experience

Bridgeport Electrical Generating Station (2000-Present) – Bridgeport (CT) Entrainment and Ichthyoplankton studies. Senior Taxonomist.

Conectiv (2000-Present) – Indian River Power Plant (NY) Impingement/Entrainment Impact Studies. Senior Taxonomist.

Vermont Yankee Public Service (1996-Present) – Bratleboro (VT) Monitoring Study. Senior Ichthyoplankton Taxonomist.

Consolidated Edison (1984-1989, 1991-Present) - Long River (NY) Ichthyoplankton and Fall Juvenile Surveys. Senior Taxonomist.

North Atlantic Energy Service Organization (1981-Present) - Seabrook (NH) Environmental Studies. Zooplankton, ichthyoplankton and copepods. Senior Taxonomist/Report Author.

Charles Poletti Power Plant Effect of Entrainment and Impingement (NY, Long Island Sound)(2002)-Ichthyoplankton, trawling and Mark-Recapture studies on Long Island Sound, East River, New York Harbor and the Hudson river. Senior Taxonomist.

Somerset Electrical Generating Station (2001) – Somerset (MA) Entrainment & Ichthyoplankton Studies. Senior Taxonomist.

Commonwealth of Massachusetts Department of Environmental Protection (1999, 2000-2001) – Fresh Water Fish Collection for Hazardous Contaminant Analysis. Fisheries Biologist.

Pilgrim Nuclear Power Station (2000) - Pilgrim Station (MA) Impingement/Entrainment Monitoring Study.

Foster Wheeler Environmental Corporation (2000) - McAllister Point (RI) Ichthyoplankton Study.

Confidential Client (1998, 1999) –Environmental Studies in Delaware. Ichthyoplankton. Senior Taxonomist.

Woodward-Clyde International Americas (1996, 1998) - PSE&G (NJ) Baywide Monitoring Program for Delaware Bay. Ichthyoplankton. Senior Taxonomist.

Pfizer Entrainment (CT) Program (1997) - Ichthyoplankton. Taxonomist.

Beak Consultants Inc. (1996-1997) - Hudson Station (NY) Hachensach River Monitoring Program. Zooplankton. Taxonomist.

City of Manchester/NH DOT (1996) - Manchester (NH) Airport Access Study. Field Biologist.

Consolidated Edison (1996) - Con Edison (NY) Pterygiophore Study. Ichthyoplankton. Senior Taxonomist.

Consolidated Edison (1995) - Hudson River (NY) Foundation Morone Identification Study. Ichthyoplankton. Senior Taxonomist.

Birch Hill Dam (1995) - (MA) Rare or Protected Species and Exemplary Natural Communities Survey Field Biologist.

Public Service of New Hampshire (1994-1995) - Bow Station (NH) Monitoring Studies. Ichthyoplankton. Senior Field Biologist/ Taxonomist.

Consolidated Hydro, Inc. (1993) - Plattsburgh (NY) Lower Saranac River Telemetry Studies. Conducted radio telemetry studies on Atlantic salmon and steelhead trout to determine the downstream passage routes of these species through the lower Saranac River Hydroelectric facility. Technical Director.

7.	Brief resume of key persons, specialists, and individual consultants anticipated for this project.		
a.	**Name & Title:** Carmela L. Tombes, President/Laboratory Director	d.	**Years Experience:** 12 **With This Firm:** 8.5
b.	**Project Assignment:** Water Quality Laboratory Task Leader	e.	**Education (Degree/Year/Discipline):** BS/1982/Biology
c.	**Name of Firm With Which Associated:** Air, Water & Soil Laboratories, Inc.	f.	**Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Professional Experience

Ms. Tombes is a corporate officer of the company and serves as Laboratory Director for comprehensive operations at the laboratory. She has more than 12 years of experience in environmental laboratory analytical testing and regulatory compliance.

As one of the founders of Air, Water & Soil Laboratories, Inc. (AWS), Ms. Tombes is jointly responsible for development of the administrative infrastructure, standard operating procedures for analytical testing and quality assurance operations. Her daily responsibilities include partial oversight of gas chromatograph operation, various wet chemistry analyses, organic data reduction analysis, comprehensive quality assurance data review, and direct management of laboratory personnel.

Ms. Tombes' corporate responsibilities include business development, client relations and professional consulting services. In addition to her in-house consulting services, Ms. Tombes provides environmental sampling and analytical testing seminars to educate clients in quality assurance issues related to the laboratory testing industry.

Prior to founding AWS, Ms. Tombes served as Laboratory Manager at Enviro-Compliance Laboratories, Inc. (ECL). Her activities at ECL included supervision of a staff of 10, organizing and scheduling the laboratory's daily work load, final QA/QC review, and signature of all certificates of analysis. As laboratory manager, Ms. Tombes also served as primary contact for clients, purchasing officer, and human resources officer.

Ms. Tombes' expertise in organic analysis began at ECL where she was operator/ manager of organic analyses utilizing HP 5985B GC/MS, HP 5880 GC/FID/ECD, HP 5710 GC/FID, HP 5790 GC/FID, HP 5730 GC/ECD, HP 7671 Autosamplers, and Tekmar LSC-2 Purge and Trap instrumentation. She is familiar with maintenance of early model and state-of-the-art Hewlett Packard instrumentation.

Ms. Tombes' analytical testing career began with Roche Analytics Laboratories as chemist/QA coordinator. At Roche, she was responsible for extensive quality assurance operations related to daily operations and state/federal proficiency reporting. Her activities also included pharmaceutical and industrial hygiene analytical testing and regulatory compliance.

7.	Brief resume of key persons, specialists, and individual consultants anticipated for this project.		
a.	**Name & Title:** John B. Thelen, Project Scientist	d.	**Years Experience:** 5 **With This Firm:** 3
b.	**Project Assignment:** Environmental Conditions Report Task Leader	e.	**Education (Degree/Year/Discipline):** MS/in progress/Environmental Engineering and Sciences Graduate Degree/1999/Ecotoxicology BS/1997/Biology
c.	**Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f.	**Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Thelen has more than 5 years of professional experience in environmental science, including ecological assessments, field investigations, feasibility studies, and environmental management system development. Mr. Thelen has been involved with environmental and health assessment work pertaining to air, groundwater, surface water, biota, and sediment contamination at a number of sites throughout the eastern United States.

Project Experience

Mr. Thelen was an instrumental BBL team member involved in the environmental reconnaissance study to examine the feasibility of using Sharps Island as a dredged material containment facility. The proposed project would restore Sharps Island using dredged material from the Port of Baltimore approach channels and create upland and wetland habitats (on a 50%-50% basis by area). As part of the study, BBL performed the Environmental Conditions Reconnaissance for Sharps Island. Mr. Thelen was responsible for a literature search and the collection of available resource information for this area of the Chesapeake Bay, including water quality data, SAV presence, Natural Oyster Bar boundaries, Essential Fish Habitat, avian community in the area, and potential impacts associated with using Sharps Island as a dredged material containment facility.

Mr. Thelen is part of a BBL team conducting a pre-feasibility study evaluation to assess potential remediation of select Aberdeen Proving Ground (APG) Environmental locations using dredged material from the Port of Baltimore. Mr. Thelen is responsible for literature reviews and the collection of available resource information for this area of the Chesapeake Bay, including water quality, sediment quality, SAV presence, recreational and commercial fisheries, Natural Oyster Bar boundaries, Essential Fish Habitat, Rare, Threatened and Endangered (RTE) species, avian community in the area, soil types, vegetation, terrestrial habitat types, potential impacts associated with possible unexploded ordnance (UXO), as well as other potential hazards within the APG area.

Wetland diversity and landscape ecology experience in a fresh/saltwater wetland in northeastern New Jersey near several landfill areas.

Collected and analyzed sediment and soil samples from stream, pond, and swamp areas adjacent to a closed chemical plant in northern New Jersey. Assisted in the surveying of these sampling locations, and analyzed laboratory data.

Authored a baseline ecological evaluation (BEE) of a former industrial site. Analyzed known contaminants and examined potential downstream ecological receptors.

Conducted research regarding historic contamination and biological diversity of various U.S. regions. Analysis of previous research regarding tissue and sediment contaminant concentrations, as well as benthic invertebrate diversity and abundance.

Conducted human health risk assessment work in the Newark Bay area to help identify risks associated with fishing and crabbing in these waters. Collection of water, sediment, and fish-tissue samples from this site. Experience with handling, storage, and transfer of these samples for laboratory analysis.

Conducted Anthrax sampling at numerous facilities in the Washington, D.C. area. Followed QA/QC protocols and aided in exposure risk assessment at facilities with potentially contaminated materials.

Collected groundwater samples at a petroleum storage facility, and evaluated the potential for contamination of an adjacent waterway.

Soil boring field sampling collection to vertically delineate contamination in the vicinity of an excavated underground storage tank.

Analyzed pesticide concentrations of agricultural lands. Planned out a soil sampling grid and took samples following proper QA/QC protocols. Assessed the laboratory results upon return of sampling data.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** Scott M. Larew, Technician II	d. **Years Experience:** 2 **With This Firm:** 1.5
b. **Project Assignment:** Field Ecology Services	e. **Education (Degree/Year/Discipline):** BS/1999/Marine Biology
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Larew has a background in marine biology and 2 years of experience in the areas of field services, hazardous waste site investigation, and implementation of Remedial Action for industrial clients. This work has provided him with proficiency in investigation/ remediation projects, multi-media field sampling investigations, and site operations and maintenance.

Project Experience
Experienced in sampling techniques and regulations in New Jersey, New York, Maryland, and Iowa. Collected groundwater samples using low-flow, three-volume purge and passive diffusion bag procedures, and soil samples using both split-spoon and Geoprobe technologies. Sampling activities were performed in compliance with both the USEPA and NJDEP technical regulations.

Leading all field activities associated with a deep bedrock investigation and an overburden/fill soil investigation at a former dye manufacturing facility. Multiple phases of the bedrock investigation include deep bedrock well installation, packer testing, retrofitting of existing wells, and compiling a conceptual groundwater model. The soil investigation involved test pit excavations, soil sampling, and the design of a remedial action. Also participating in the construction, implementation, and monitoring of an in-situ oxidation injection pilot study.

Experienced in the oversight of and activities associated with many methods of well installation and development. Also experienced with well redevelopment through both chemical treatment and surge/flush activities.

Experienced in the interpretation and oversight of in-situ constituent screening using ultraviolet induced fluorescence (UVIF) technology associated with subsurface soil investigations using cone pentrometer testing.

Participated in a Supplemental Site Investigation at a pesticide manufacturing plant under the Iowa Department of Natural Resources voluntary cleanup program. Performed sampling associated with the Site Investigation at a chemical processing facility in New Jersey. Contributed text and various data compilations to the reports associated with the projects.

Performing Quality Assurance oversight, sampling, and reporting during the remedial design construction through the operations and maintenance (O&M) phases of a groundwater extraction and treatment system at a Superfund site in New Jersey. Also assisting in the O&M at an N3 multiphase extraction/ bioremediation plant and at an N2 FBR system in New Jersey.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** E.J. Suardini, Environmental Technician	d. **Years Experience:** 2 **With This Firm:** 2
b. **Project Assignment:** Field Ecology Services	e. **Education (Degree/Year/Discipline):** BS/2002/Natural Resources
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Suardini has a background in environmental science and 2 years of experience in field services and field engineering and investigation, including sampling of sediments, soil, and groundwater at various sites.

Project Experience

Provided construction oversight for an $800,000 sediment removal project using hydraulic dredging of a lake and river system used for cement manufacturing in Dundee, Michigan. Responsibilities included oversight of day-to-day activities, oversight of all subcontractors, and interaction with the client during the dredging of 140,000 cubic yards of sediment. Deposited sediment used as a basis for environmental cover and wetland system.

Provided construction oversight and construction quality assurance engineering for a $4.75 million multi-phase remediation and closure project at a cement production plant in Charlevoix, Michigan. Responsibilities included construction oversight and documentation, field engineering and design team coordination, and client and agency liaison. Responsibilities included consolidation and closure of historical cement kiln dust (CKD) piles with excavation and relocation, installation of a geomembrane for a 35-acre pile closure, and installation of a groundwater interceptor trench.

Member of the Flint, Michigan (NAO) GM remediation team responsible for the development and sampling of newly installed wells. Led the passive recovery of non-aqueous phase liquid (NAPL) for the entire site. Aided other team members with day-to-day activities.

Led an operations and maintenance field team at two GM sites: Saginaw Malleable Iron in Saginaw Michigan and Lansing Grand River Assembly in Lansing, Michigan. Responsibilities included weekly site visits, developing checklists, troubleshooting, and client interaction.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** Stephen P. Truchon, Senior Ecologist	d. **Years Experience:** 14 **With This Firm:** 3
b. **Project Assignment:** Senior Benthic/Fisheries Ecologist	e. **Education (Degree/Year/Discipline):** PhD/in progress/Environmental Studies MS/1988/Zoology BA/1982/Biology
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Truchon is an ecologist with more than 14 years of experience in terrestrial and aquatic habitat evaluations, biological impact analysis, and ecological risk assessment. The emphasis of his experience has been on freshwater and estuarine ecosystems throughout the United States and Puerto Rico. He specializes in evaluating the bio-availability and effects of organic (particularly PAHs and PCBs) and inorganic chemicals. Much of his consulting experience has been in the management of large technical tasks and multidisciplinary projects on both state and federal levels. Mr. Truchon has provided litigation support for numerous projects with contaminated sediment issues for natural resource damage assessments (NRDAs) and has developed and implemented scientifically defensible technical and field investigations for ecological assessments, thermal impact assessments (316a and b), and state-level antidegradation studies. He has direct project experience and familiarity with several state- and/or federal-level regulations and guidance for ecological assessments. For example, Mr. Truchon has direct field and project experience at the Fox River and Green Bay, Wisconsin; Saginaw Bay and River, Michigan; Portland Harbor, Maine; the Great Bay Estuary in Maine and New Hampshire; Boston Harbor, the Charles River, and a major waterway in Massachusetts; a major waterway in the Northeast; and Long Island Sound in New York; the Passaic River, New Jersey; the Schuylkill River, Pennsylvania; the Cape Fear River, North Carolina; the Ashley River, South Carolina; Saint Simon Estuary, Georgia; bayous of the Sabine-Neches Estuary, Texas; and Mayaguez Bay, Puerto Rico.

Project Experience

Field team leader for the aquatic habitat assessment and fish tissue collection tasks conducted in support of various remedial activities in the Lower Fox River and Green Bay (Wisconsin). PCBs in sediments are the primary contaminant of concern. Field work included managing several subcontractors hired for sonar mapping of the river bottom and catching fish using electro-shocking, frame-net, and hoop-net methodology. Lead author in preparing the aquatic ecology section of report addressing aquatic habitat characterization for the Lower Fox River and Green Bay assessment area. The report was used as a cornerstone in development of a strategic risk assessment and remedial strategy for the PRP group.

Served as field team leader for evaluation of a fisheries community and collection of target fish species using electrofishing sampling techniques. Primary contaminants of concern were PCBs at various concentrations throughout Thompson Island Pool to Schuylerville, New York. Worked directly with NYSDEC and USGS fishery biologists to collect fish from various river habitats for field tissue processing. Co-authored sections of a report that described fish assemblages and food web structure in several specific types of aquatic habitats.

Field leader for habitat assessment and sediment collection for toxicity testing using Chironomus tentans and Hyalella azteca at a Massachusetts wavered site that anticipated listing under 21E of the Massachusetts Contingency Plan (MCP). Authored document that combined summary of Phase I (sediment toxicity) and Phase II (sediment chemistry analysis) investigations. In addition, conducted additional focused site investigations (off-site sources, downstream sampling) and wrote technical memorandum for considering bioavailability factors in sediments.

Served as a field team member and assistant task manager for developing a scientifically defensible decision matrix for evaluating and selecting appropriate reference sites to compare with reaches of a major waterway in Massachusetts where benthic macroinvertebrate and fish communities were exposed to various concentrations of PCBs. Assisted in preparation of a work plan and field implementation protocols.

Field team leader and task manager for an ecological impact assessment of the Salt Kill Brook adjacent to a New York facility that develops light weight aggregate from the burning of shale. Primarily responsible for sampling, coordinating with toxicology laboratories, and providing technical summary associated with numerous physical and biological conditions not related to the client's discharge. Shortly thereafter, a report was submitted by the NYSDEC, suggesting similar conditions and eliminating the client from further liability.

Participated in the collection of surface water, sediments, and benthic samples in Hempstead Bay Estuary (Long Island, New York) as part of a preliminary ecological assessment to determine the nature and extent of current and historical organic input from the Bay Park Sewage Treatment Facility.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.	
a. **Name & Title:** Timothy M. Donegan, Senior Project Engineer	d. **Years Experience:** 6 **With This Firm:** 1
b. **Project Assignment:** Senior Engineer/Island Restoration Specialist	e. **Education (Degree/Year/Discipline):** MS/2001/Civil Engineering (Ocean) BS/1995/Civil Engineering
c. **Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f. **Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Donegan has more than 6 years of experience in the areas of dredging containment facilities and dredged materials disposal techniques; port and harbor planning and development; coastal protection; navigation channel design; dredging production analysis; and equipment selection. He has also installed several tide gauges to be used in tide studies for various dredging- and modeling-related projects.

Poplar Island Habitat Restoration Project
Poplar Island is a 1,000-acre dredged material containment facility. The island is constructed of 10-foot-high sand dikes protected by 250 4,000-pound armor stone. When filling the island with dredged material is completed, half of the island will be developed into four tidal marshes and planted with native wetland species. The upland portion of the island will also be planted with shrubs and trees native to the region.

Work on the Poplar Island Habitat Restoration project included initial design, construction specifications, construction supervision, surveys, hydrodynamic modeling of the wetland, dredged material capacity estimates, dredged material inflow, design of tidal wetlands, and project management. Preparation of construction drawings included alternative dike geometry layouts, dike profiles, and typical dike and access channel cross sections. Volume computations for all construction materials were calculated. Capacity estimates were also made based on dike alignments and known characteristics of the dredged material regarding the bulking and shirking of the material during the dredging process.

During the construction process, collected information from the contractor and kept track of all rock and sand quantities as well as change orders and other paperwork submitted by the contractor and USACE. Reviewed the contractor's surveys for accuracy and determined if the dike materials were placed within the contract template. Responsible for the performance of over two dozen surveys for this project. Surveys included before dredge surveys prior to island construction, dike section surveys using RTK (GPS) survey equipment during construction, and hydrographic surveys within the interior of the island during dredged material inflow. A one-year tide study was also conducted. The tide information will be used for modeling of the tidal wetlands.

Following inflow of dredged material into the test cell, fabricated a sediment-sampling device to be used on fine-grained dredged material. The device allows discrete one-foot interval samples to be taken at any depth below the surface. This device allows 100% recovery of material. Samples were collected throughout the test cell to calculate the void ratio of the material as it consolidates. These void ratios were compared to predicted void ratios to aid in the estimate of rate of consolidation.

Other Project Experience
Performed a feasibility study for the Whites Basin/Raccoon Island dredged material containment facility on the Delaware River, New Jersey. Developed preliminary dike alignment and capacity calculations for a 400-acre placement facility. Reviewed existing geotechnical information.

Completed a preliminary feasibility study of five containment areas, all sites more than 1,000 acres, in the Upper Chesapeake Bay, Maryland. Performed volume estimates, drawing preparation, TIN modeling, preliminary dike alignments, and review of geotechnical data. Prepared data that would be used for hydrodynamic modeling of the proposed islands.

Preliminary Feasibility Study, dike alignment, volume computations, and drawing preparation for a 200-acre facility located on the grounds of the Bethlehem Steel Corporation in Sparrows Point, Maryland, to be managed by the Maryland Port Administration.

Dike alignment, TIN modeling, drawing preparation, and volume computations for dredged material placement facility in the central Chesapeake Bay to raise dikes to +42 feet from an existing dike elevation of +24 feet. Calculations were also performed to determine the increased capacity of the site as well as the numbers of years that it would be operational.

Preliminary Feasibility Study and Final Design at CSX/Cox Creek, Maryland. Performed dike alignment, volume computations, drawing preparation, and final plans. Capacity estimates based on different dike scenarios were performed. Reviewed Tensar Geogrid design for slope stability.

7.	Brief resume of key persons, specialists, and individual consultants anticipated for this project.		
a.	**Name & Title:** Anthony Esposito, Senior Project Scientist II	d.	**Years Experience:** 22 **With This Firm:** 3.5
b.	**Project Assignment:** Senior Wetland/Terrestrial Ecologist	e.	**Education (Degree/Year/Discipline):** BS/1981/Wildlife Biology AAS/1979/Natural Resources Conservation
c.	**Name of Firm With Which Associated:** Blasland, Bouck & Lee, Inc.	f.	**Active Registration (Year/Discipline):**

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Esposito's has more than 22 years of experience in the areas of wetland assessment and restoration, ecological risk assessment (ERA), biological and ecological surveys, environmental impact assessments, wetland evaluation technique (WET), Habitat Evaluation Procedure (HEP), and Superfund hazardous waste site investigations.

Project Experience

Used site-specific primary production data and bioenergetics models to evaluate the production of fish from 1,500 acres of tidal wetlands restored along the Delaware River in support of a SPDES permit renewal for an electrical utility in eastern New Jersey.

Delineated the boundaries of mangrove wetlands along the discharge canal of an electrical utility in Palo Seco, Puerto Rico. Performed a wildlife survey, and identified and characterized fish and wildlife habitat on the 200-acre facility that is located on a peninsula between San Juan Bay and Boca Veja Bay.

At Cape Canaveral Air Force Base, Florida, completed ecological assessments of 26 hazardous waste sites on terrestrial, marine, and estuarine wildlife receptors. Work included vegetation surveys and collecting and analyzing plant, invertebrate, fish, and small mammal samples. Prepared a base-wide ecological risk assessment program for the Air Force base and the adjacent Banana River.

Delineated wetland boundaries and prepared a wetland restoration plan for 2.4 acres of wetlands in Cedar Creek, Wisconsin that were to be disturbed by the excavation of sediments from the floodplain of Cedar Creek.

At Eglin Air Force Base in Florida, completed ecological risk assessments of 13 hazardous waste sites on terrestrial and aquatic receptors.
Delineated wetland boundaries and negotiated permit requirements with the Army Corps of Engineers and the New York State Department of Environmental Conservation (NYSDEC) for the construction of the Onondaga Lake circumferential bike trail through forested wetlands.

Monitored the restoration of riparian habitat impacted by remedial activities along an urban creek in Kentucky. Negotiated with state regulators and developed a maintenance plan to address vegetation stressed by drought conditions and landowner interventions.

Developed a habitat enhancement plan for a large urban lake in Syracuse, New York that involved wetland creation, littoral zone enhancements, fish habitat creation, and fish stocking.

Delineated the boundaries of 150 acres of wetlands impacted by chemical releases from a Superfund Site in New Jersey. Also characterized wetland habitats and wildlife inhabitants of forested wetlands, tidal tributaries, and freshwater ponds.

Mitigated wetland impacts from road construction and stream crossing through hydrologic and vegetative enhancements of adjacent upland areas for the town of Egremont, Massachusetts.

At a major river in Wisconsin, managed the collection of fish samples as part of a long-term biomonitoring evaluation of contaminant concentrations in resident biota, following remedial activities.

At the Mud River in Kentucky, managed the collection of fish samples as part of a long-term biomonitoring evaluation of contaminant concentrations in resident biota, following remedial activities.

In Moira, New York, collected small mammal samples from reference and site-related locations to evaluate the bioavailability of soil contaminants.

7.	Brief resume of key persons, specialists, and individual consultants anticipated for this project.		
a.	**Name & Title:** Siva Balu, P.E., CEO / Geotechnical Engineer	d.	**Years Experience:** 17 **With This Firm:** 6
b.	**Project Assignment:** Senior Geotechnical Engineer	e.	**Education (Degree/Year/Discipline):** MS/1987/Geotechnical Engineering BS/1983/Civil Engineering
c.	**Name of Firm With Which Associated:** E2CR, Inc.	f.	**Active Registration (Year/Discipline):** 1992/Professional Engineer, Maryland # 20054

g. **Other Experience and Qualifications Relevant to the Proposed Project:**

Mr. Balu has more than 17 years of experience in geotechnical engineering and materials testing. He has performed geotechnical investigations for more than 400 projects on the East Coast, including the following: design for reaining the dikes at CSX/Cox Creek Dredged Material Containment Facility in Anne Arundel County, MD; the design of the 1,000-acre dredged material containment site at Poplar Island in Talbot County, MD; the design of a 3-story research facility and greenhouse for Morgan State University in Baltimore, MD; and Principal-in-Charge of an open-end construction inspection contract with the Maryland Transportation Authority.

Project Experience

Project Engineer for geotechnical investigation for 3-story Research Facility and Greenhouse structure for Morgan State University in Baltimore, Maryland.

Geotechnical investigation for over 400 projects on the East Coast.

Geotechnical investigation for the new runway at Kent County Airport in Delaware.

Subsurface exploration, geotechnical evaluation/design of a nine story court house building in Arlington, Virginia.

Project Engineer for open-end geotechnical contract with MdTA for the following projects: King Avenue Bridge over I-95, I-95/272 Intersection, Clayton Road slope failure.

Project Engineer for open-end geotechnical contract with Mass Transit Administration for the following projects: North Avenue slope failure, Frederick Line-karst study including grouting, Jones Falls Line-Retaining Wall failure.

Principal-in-charge of open-end Construction Inspection contract with Maryland Transportation Authority.

Geotechnical Engineer for the WSSC Seneca Wastewater Treatment Plant a 6 MGD new secondary unit. Project included 50+ borings, designing foundation systems, and evaluating problems associated with construction methods for various structures.. Also evaluated the corrosion potential using in-situ and laboratory tests.

Prepared health and safety plan for confined work space, cored/ evaluated concrete, conducted chemical testing and petrographic analysis for the Patapsco WWTP in Baltimore, Maryland.

Inspection/testing of Clarifier Tanks at Ashburton Water Treatment Plant, Baltimore. The project included crack mapping, void detecting, corrosion analysis, concrete coring, chemical testing and petrographic analysis.

Geotechnical investigation for the addition of two 70-foot diameter sludge thickeners at Patapsco Waste Water Treatment Plant, Baltimore, Maryland. The project included designing of foundation system and evaluation of dewatering and construction methods for the structures with bottom at Elevation –15. Also tested/evaluated the removal of chromium contaminated soils and water.

Geotechnical investigation associated with the design in raising the dikes at CSX/Cox Creek Dredged Material Containment Facility in Anne Arundel County, Maryland.

Slope stability analysis and settlement evaluation for vertical expansion of existing landfill in Peabody, Massachusetts.

Geotechnical investigation and design of pile foundation for storage tanks for Vista Chemicals, Baltimore, Maryland.

Subsurface exploration and geotechnical evaluation for the Energy Resource Recovery Facility for the landfill site in Lorton, Virginia.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
A. PROJECT NAME AND LOCATION	B. NATURE OF FIRM'S RESPONSIBILITY	C. OWNER'S NAME AND ADDRESS	D. COMPLETION DATE (ACTUAL OR ESTIMATED)	ENTIRE PROJECT	WORK FOR WHICH FIRM WAS/IS RESPONSIBLE
(1) CERCLA Remedial Investigation, Estuarine Portion of the Passaic River, New Jersey	See below	Tierra Solutions East Brunswick, NJ	2005	$25,000	$5,000

BBL is serving as the primary remedial investigation/feasibility study (RI/FS) contractor for the Passaic River Study Area (PRSA). As part of this project, BBL is also providing high-level ecological assessment services for the project. The PRSA is 6 miles in length and drains a 935-square-mile watershed encompassing 117 municipalities in northeastern New Jersey. Land use in the area is dominated by high-density commercial and industrial/commercial development. Throughout the area, there exists a highly developed network of highways, combined sewer overflows (CSOs), stormwater outfalls, and publicly owned treatment works (POTWs). The historical expansion of industry and population surrounding the area has resulted in degraded sediment, water quality (i.e., water is rated very poor), and natural habitat. The river's sediment contains a wide variety of chemical contaminants, including (but not limited to) a variety of metals, pesticides, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and dioxins/furans. BBL's role as the RI/FS and Ecological Risk contractor encompasses the following activities:

- Performing habitat and ecological community surveys to quantify and characterize the habitat and fish, birds, and other organisms in the area; these surveys include terrestrial, wetland, and aquatic habitat characterizations, a fish community survey, and an avian community survey;
- Conducting an ecological risk assessment to calculate ranges of risk-based remediation goals; this effort includes evaluating the relationships between sediment and biological chemistry, along with benthic invertebrate mortality and community structure;
- Evaluating potential ecological and human use restoration options for the river as part of an urban river restoration initiative being contemplated by the USACE, USEPA, and NOAA;
- Publication of a book entitled *A Common Tragedy: History of an Urban River,* which characterizes the ecological and economic history of the river;
- Evaluating CSO discharges into the river to determine the types and concentrations of chemicals that are discharged to the study area from ongoing pollution sources;
- Developing an in-depth remedial investigation report enveloping a significant amount of sediment and biological data obtained since 1995; BBL has implemented a GIS system to facilitate the evaluation of these data; and
- Developing a feasibility study report (consistent with CERCLA) that will evaluate the full realm of remedial alternatives potentially applicable to the site.

BBL has also developed a number of site-specific monitoring programs within the Passaic River and Newark Bay Estuary. These intensive programs have focused on various sediment removal activities.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
A. PROJECT NAME AND LOCATION	B. NATURE OF FIRM'S RESPONSIBILITY	C. OWNER'S NAME AND ADDRESS	D. COMPLETION DATE (ACTUAL OR ESTIMATED)	ENTIRE PROJECT	WORK FOR WHICH FIRM WAS/IS RESPONSIBLE
(2) Fox River Group NRDA and Remedial Investigation/Feasibility Study	See below	Fox River PRP Group Wisconsin	2003	$10,000	$3,000

On behalf of the Fox River Group (FRG), BBL has provided technical support to defend against a natural resource damage assessment (NRDA) initiative related to the presence of PCBs in the river system. As part of this initiative BBL staff designed and implemented a large-scale field sampling program to collect ecological, hydrographical, and physicochemical data. Extensive river and shoreline characterization was performed, including GIS-based habitat mapping, side-scan sonar mapping of the river bottom, fisheries and benthic community surveys, wildlife surveys, and sediment and water quality sampling. These data were used to support the developments of technical reports and ecological/human health risk assessments.

Working cooperatively with other consultants, BBL conceptualized and evaluated approximately 50 natural resource restoration, preservation, and use enhancement projects as part of a settlement package. We then managed the design and construction for new and upgraded waterfront recreational facilities at the 1,000 Islands Environmental Center, including:

- waterfront trail that was upgraded to a low-maintenance, wheelchair accessible trail;
- new combination fishing pier and canoe launch, also wheelchair accessible;
- new observation deck for outdoor education and viewing of river habitat and waterfowl;
- upgraded access point with new parking lot and vehicle turn-around;
- new visitor sign-in and information station; and
- new interpretive signs to support the new facilities.

BBL personnel also conducted and reported sensitivity analyses of the state's PCB fate and transport model of the Fox River below DePere Dam. The analyses identified significant problems in sediment transport modeling—a problem to be corrected by work under the Memorandum of Understanding (MOU). BBL also provided critical review of the RI/FS documents, including human health and ecological risk assessments.

Using in-house talent and state-of-the-art electronic techniques, BBL developed and delivered presentations regarding technical issues and the projects proposed for settlement purposes.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
A. PROJECT NAME AND LOCATION	B. NATURE OF FIRM'S RESPONSIBILITY	C. OWNER'S NAME AND ADDRESS	D. COMPLETION DATE (ACTUAL OR ESTIMATED)	ENTIRE PROJECT	WORK FOR WHICH FIRM WAS/IS RESPONSIBLE
(3) Wetlands and Terrestrial Ecology Investigation, New York	See below	Confidential	1995	$100	$100

BBL performed extensive surveys of fish, terrestrial vertebrates, macroinvertebrates, and wetland plant communities as part of an ecological investigation at a CERCLA site. Fish were collected using electrofishing and netting techniques. Quantitative methods were employed to determine fish community structure and species abundance. Selected sport fish and forage fish samples were also retained for chemical analysis.

Terrestrial mammals were sampled using various trapping methods. Population sizes were estimated and compared among various areas of the site to determine if there were any contaminant-related impacts. Selected mammal and macroinvertebrate samples were also retained for tissue residue analysis and comparison to water quality, soil, and sediment chemical data.

The assessment of vegetative communities at the site included wetland delineation and an evaluation of wetland function and value in accordance with the USACE Wetlands Delineation Manual and Wetland Evaluation Technique (WET). Wetland functional value was compared to reference locations, and no contaminant-related effects were found.

Sediment samples were also obtained from various drainage pathways and submitted for laboratory toxicity and bioaccumulation testing. Sediment assays involved *Hyalella, Chironomus*, and *Lumbriculus* acute and chronic tests. Tests were used to identify thresholds of toxicity and determine the need for sediment remediation.

The study results successfully documented the lack of impact on aquatic communities and vegetative communities, and a limited impact to terrestrial small mammals and the sediment-associated food web at the site. Based on these results, a small area of sediments was remediated. Collectively, the ecological studies reduced the size of the potential remediation area from 150 to 8 acres.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(4) Ecological Assessment, Puerto Rico	See below	Confidential	2001	$60	$60

BBL designed and implemented an ecological assessment in association with RI/FS activities at a 100-acre site. Activities included habitat quality assessments, receptor species identification, aquatic biota tissue residue sampling, and wetland delineation. The site included active manufacturing areas, saltwater habitats, subtropical moist forest areas, and mangrove swamps.

Aquatic biota were sampled using various traps and netting techniques. Target species included sport fish, forage fish, and benthic invertebrates. Edible-size fish fillet samples and crab muscle samples were obtained to evaluate potential human exposure to sediment-associated contaminants. Forage fish and crab whole-body samples were used to evaluate potential food chain exposure of piscivorous wildlife.

Habitat quality was also evaluated throughout the site. Portions of the facility were developed and used for industrial purposes and thus had little wildlife habitat value. Other portions of the site were undeveloped and provided habitat for various species. The habitat quality assessment provided information that was used in conjunction with soil, sediment, and water quality data to identify media and locations for further consideration in a baseline ecological risk assessment.

Information obtained in these investigations was used to develop a conceptual site food web exposure model, including identification of potential ecological receptors and areas of interest for the subsequent ecological risk assessment.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(5) Habitat and Ecological Characterization, River Site, Northeastern United States	See below	Confidential	2002	$100	$100

Since 1992, BBL has performed extensive aquatic biota sampling and habitat assessment related tasks in various parts of an 8.5-mile stretch of river in the northeastern United States. This work was done in support of RSI (Phase I and II), NTCRA, SRS, and RI/FS activities and included surveys of fish and benthic invertebrates, studies involving fish movement, caged fish, and caged mussels, and characterization of aquatic habitat.

Fish were sampled using electrofishing, trapping, and netting techniques. Over 100 adult sport fish (a top-down pelagic predator and a bottom feeder) are collected yearly for human health risk assessment to analyze temporal and spatial trends in contaminant tissue residue concentrations in edible fillets. A similar number of forage fish are collected yearly and analyzed as whole-body composite samples for ecological risk evaluations. Over a two year period, approximately 1,500 fish were marked using a site-specific fin-clip to track fish movement during a mark-and-recapture program. Fish movement was analyzed to better understand fish habitat use and to refine spatial and temporal trends in tissue concentrations.

Benthic invertebrates were sampled in multiple programs using grab samplers (a standard 6"x6" Ekman and 9"x9" Ponar) and artificial substrate samplers (Hester-Dendy multiplate). Over 160 benthic samples were collected to date to examine the potential effects of sediment dredging and sediment capping to the benthic community. Data were analyzed using family and species level taxonomy in a multimetric approach to assess possible spatial and temporal related trends in benthic abundance, diversity, composition, and tolerance.

Caged fish and mussel studies were conducted in the river to examine short-term uptake of water column contaminants associated with the sediment dredging project. Habitat surveys included characterizing epifaunal substrate and available in-stream cover, as well as bank vegetation and stability and cover-type composition of the riparian zone. The study indicated that habitat quality and substrate characteristics affected the diversity, abundance, and distribution of aquatic biota in the river.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(6) Ecological Investigation at a CERCLA Site, USEPA Region 5	See below	Confidential	1996	$150	$150

BBL conducted extensive ecological investigations in support of RI activities at a large CERCLA Site in USEPA Region 5. Ecological investigations included fish and terrestrial vertebrate and invertebrate sampling, turtle sampling, caged fish studies, fish movement, diet, and aging studies, and wetland plant identification and delineation. In addition, RI activities included investigation of contaminated sediments and soils, as well as an analysis of chemical fate and transport. In total, the RI encompassed three separate active industrial facilities, former industrial sites, four landfill disposal areas, waste treatment lagoons, and a 75-mile portion of river. The site also included approximately 1,000 acres of wetland soils from former impoundments.

Fish were sampled from multiple riverine and lacustrine locations, including reference locations, using electrofishing, trapping, and netting techniques. Fish were collected for human health and ecological risk assessment purposes. Stomach content analyses were performed on a subset of piscivorous, omnivorous, and planktivorous fish species to determine diet composition and to identify possible food chain pathways of exposure to contaminants. Fish movement was analyzed to better understand fish habitat use and to define spatial and temporal trends in tissue concentrations. Fish were aged using body parts (scales, spines, or otoliths) to examine relationships between age and tissue contaminant concentrations.

Terrestrial sampling included field mice and earthworm collections as part of the ecological risk assessment. Mice were collected using a combination of live traps and snap traps. Earthworms were collected by hand. Results were used to assist in the development of site-related sediment bioaccumulation factors (BAFs).

Snapping turtles were collected using baited live traps and processed as edible tissue samples for human health purposes. In situ caged fish studies were used in the ecological assessment to examine short-term uptake of contaminants in forage fish from the water column. Lastly, wetland plant communities were delineated so that mitigation alternatives could be considered.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(7) Young-of-year Fish Monitoring Program, Massachusetts	See below	Confidential	2002	$150	$150

BBL investigated sediments, water column, biota, floodplain soils, and siltation rates in portions of up to 60 miles of river as part of a RI/FS, remedial facility investigation (RFI), and Remedial Design/Remedial Action (RD/RA) program. Historically, the river received discharges from local facilities that added PCBs, metals, and low-level concentrations of VOCs, SVOCs, PCDDs/PCDFs to the sediments. Biota investigations in the river have been conducted since 1990 for the purposes of human health and ecological risk assessment and have included fish sampling surveys, fish aging analysis, caged fish and mussel studies, invertebrate sampling, and a habitat assessment.

Fish were sampled from impounded and free-flowing portions of the river using electrofishing and netting techniques. Adult fish were analyzed as individual fillets for human health assessment purposes. Young-of-year (YOY) fish were analyzed as whole-body composite samples to aid in ecological risk assessment and to provide an indicator of contaminant bioavailability. A subset of fish were aged using scales to examine the relation between age and contaminant concentrations.

Caged fish and mussel studies were conducted in the river to estimate short-term uptake of water column contaminants. Caged fish were used to evaluate ecological risk. Caged mussels were used to examine the effects of pre-, during-, and post-remediation activities. A baseline in-river habitat assessment was conducted prior to remediation to help develop project restoration goals. Benthic invertebrates were collected using kick-net sampling.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(8) Sharps Island Restoration, Maryland	See below	Maryland Environmental Service 2011 Commerce Park Drive Annapolis, MD 21401	2002	$68	$68

The historical Sharps Island footprint is under consideration for possible creation of a wetland and upland island habitat. The original island completely disappeared in the early 1960s, possibly due to a variety of physical and environmental factors. Sharps Island is located approximately 4 miles south of Tilghman Island (Talbot County) and 4 miles west of Cook Point (Dorchester County) at the mouth of the Choptank River.

BBL performed an Environmental Conditions Reconnaissance of Sharps Island. This effort included a literature search and review of existing resource information and potential impacts due to island construction. Through research and consultation with commercial fisherman and sport fishing associations, the extent and locations of fishing, boating, and seasons of use were evaluated. Essential Fisheries Habitat (EFH) and Habitat Area of Particular Concern (HAPC) at the site were also assessed. Parameters of concern that were assessed include:

- Water and sediment quality;
- Habitats and wildlife;
- Fisheries and benthic communities;
- Recreational community;
- Rare, threatened, and endangered species (RTE); and
- Historical/cultural resources and critical areas.

Also, BBL performed a dredging engineering study. BBL's role was to provide an engineering assessment of the feasibility of constructing a dredged material containment facility. Specifically, BBL's tasks (in relation to dredging) were:

- Review the existing geotechnical information;
- Examine five potential dike alignments;
- Review the coastal engineering design; and
- Prepare estimates of neat quantities of material that would be used for the island construction.

A cost estimate was made to determine the costs associated with dredging material from the Baltimore Harbor approach channels and transporting to and placing at the proposed facility.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(9) Lake Okeechobee Sediment Management Services, Florida	See below	South Florida Water Management District 3301 Gun Club Road West Palm Beach, FL 33416	2003	$955	$955

BBL has provided sediment management support services related to organics and inorganics in 730 square miles of Lake Okeechobee since January 2000. Our work has included the following:

- Development of goals and performance measures for the project;
- Public and interagency outreach plans;
- Evaluation of physical and chemical sediment data in Lake Okeechobee and feeding tributaries;
- Feasibility study to evaluate all possible sediment management options, including, but not limited to, dredging, in-situ capping, and chemical treatment;
- Feasibility study to evaluate beneficial reuse of both treated waters and remaining solids, including, but not limited to, agricultural soil blending, pelletized fertilizer, and glass or concrete block;
- Sediment fate and transport modeling;
- Conducting interagency and public outreach meetings;
- Website updates and reports to the governing board;
- Coordination with USACE, FWC, and USFWC; and
- Public and interagency outreach.

The condition of Lake Okeechobee is a critical factor in the efforts to restore the world-renowned Everglades and maintain an adequate water supply for South Florida's people, industry, and agriculture. The lake typically contains more than one trillion gallons of water and serves as the headwaters to the Everglades as well as the Caloosahatchee River and several canals. Over the past century, water quality in Lake Okeechobee has changed dramatically, largely as a result of increased population and farming stresses in the lake basin. The increased intensity of human settlements and agricultural activities led to substantial increases in the level of nutrients – in particular, phosphorus – entering the lake through its tributaries and in storm water runoff.

The primary purpose of the study is to analyze all of the possible options for reducing internal phosphorus loading in the lake. BBL analyzed 35 different sediment management technologies to identify the ones that could be used as building blocks to put together a range of potentially feasible and effective sediment management alternatives. After a detailed technical assessment, the team developed seven alternatives that, if implemented, could possibly meet the five goals of the program.

Potential effects of any given alternative will be evaluated in terms of impacts/benefits to submerged aquatic vegetation, wetland vegetation in the littoral zone, fish, aquatic invertebrates, manatees, alligators, snail kites, and wading birds.

8. WORK BY FIRM OR JOINT VENTURE WHICH BEST ILLUSTRATES CURRENT QUALIFICATIONS RELEVANT TO THIS PROJECT.				E. ESTIMATED COST (IN 1,000S)	
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(10) Ecological Investigation, Alabama	See below	Confidential	2003	$500	$500

For a RI/FS process, BBL conducted habitat and ecological investigations for a riverine floodplain in Alabama. During the Fall of 2001 and the Spring of 2002, a series of floodplain transects were established along a 39-mile reach of a large freshwater creek in the Southeastern United States. Transects (n= 12) of the 100-year floodplain were set perpendicular to the creek to aid in the surveys of vegetation and wildlife during the two seasons. The purpose of the surveys was to: 1) compile information in a searchable database; and 2) use information to support exposure assumptions in a quantitative ecological risk assessment.

Vegetation surveys focused on the predominant species and abundance of groundcover, understory, and canopy vegetation types. A series of aerial photographs were brought into the field, and detailed notes on the habitats provided by the various species of vegetation and cover were recorded in a field logbook. These notes were used to document changes in habitat type along each transect and to verify the "fingerprint" of each habitat type for purposes of delineating floodplain habitats throughout the 39-mile reach of the creek. Wildlife species that were identified by sight, call, or sign (e.g., scat, daybeds, slides, dens, paths, etc.) were also noted in the habitats where found.

In addition to the floodplain habitat and wildlife assessment, both shorelines of the creek were videotaped along the 39-mile reach for purposes of identifying key habitats and wildlife use of the creek. As part of the shoreline assessment, sandbars were visually examined to document tracks of wildlife that forage along the creek. This information was added to the database and will be used to support the selection of ecological receptors for the risk assessment.

9. All work by firms or joint-venture members currently being performed directly for federal agencies.					
A. Project Name and Location	B. Nature of Firm's Responsibility	C. Agency (Responsible Office) Name and Address and Project Manager's Name and Phone Number	D. Percent Complete	E. Estimated Cost (In 1,000s)	
				Entire Project	Work for Which Firm Was/Is Responsible
None					

10. Use this space to provide any additional information or description of resources (including any computer design capabilities) supporting your firm's qualifications for the proposed project

A. OVERVIEW OF THE TEAM

Blasland, Bouck & Lee, Inc. has assembled a team consisting of top-notch scientists for this unique and challenging MES project. Our team consists of the following firms:

- **Blasland, Bouck & Lee, Inc (BBL)** – a national leader in environmental consulting services, including sediment management, environmental dredging and disposal site (including CDF) design, ecological assessment, sampling/analysis, restoration services, hydrographic surveys, graphics design (CADD/GIS), data management and statistical analyses, and construction management.

- **Air, Water & Soil Laboratories, Inc. (AWS)** – a Women-owned Business Enterprise (WBE) firm providing water and sediment analytical chemistry services.

- **Earth Engineering, Construction and Remediation (E2CR)** – a Minority Business Enterprise (MBE) firm with considerable geotechnical sampling and engineering experience with MES on all major Chesapeake Bay dredging and dredged material management projects.

- **Normandeau Associates, Inc.** – a firm with experienced taxonomists specializing in the processing and identification of aquatic organisms, including plankton, benthic invertebrates and fish.

Thus, we have assembled a team that is not only uniquely qualified, but also consisting of a significant MBE/WBE participation. Our estimated participation in these categories is 18.5%.

B. ABOUT BBL

BBL was incorporated in 1984 by 12 professionals in Syracuse, New York, whose goal was to establish a nationally recognized source of creative solutions to a broad range of environmental engineering and scientific problems. Since that time, our firm has grown to include the following affiliated groups and companies:

- BBL Environmental Services, Inc. (hydrographic surveys, field sampling, contaminated sediment assessment, and construction management);
- BBL Sciences (environmental assessments, ecological field sampling and analysis, wetlands ecology, and habitat restoration);
- Jacobs-BBL (water treatment/wastewater engineering); and
- Triangle Economic Research (cost-benefit and economic services).

Together, we employ more than 600 engineers, scientists, economists, and technical support personnel in more than 30 offices throughout the United States. This project will be served out of our Annapolis, Maryland office.

An industry leader, BBL is ranked 34th on *Engineering News Record's* (ENR's) list of Top 200 Environmental Firms, 74th on ENR's list of Top 500 Engineering Design Firms, and 13th on ENR's list of Top Hazardous Waste Firms. Much of the firm's success and growth is due to our ability to conduct large, multifaceted projects. This success is primarily the result of a corporate management philosophy that facilitates effective coordination among specialized company divisions performing different project functions.

C. QUALIFICATIONS AND EXPERIENCE OF KEY TECHNICAL STAFF

This project will be managed by **Timothy J. Iannuzzi (BBL) in BBL's Annapolis, MD office.** Mr. Iannuzzi has more than 14 years of national and regional (Chesapeake Bay) experience in environmental assessments and ecological investigations (including many contaminated sediment sites). He will be assisted by the following team of task leaders:

David J. Buys, a Project Scientist with BBL, will serve as **Field Studies Task Leader**. Mr. Buys has extensive experience in managing and implementing ecological field investigations. Mr. Buys provides direction in the laboratory and field, including management of personnel and equipment. He also designs and implements long-term field studies and provides statistical analyses and data evaluation of data.

Robert J. Dancewicz-Helmers, a Senior Taxomist with Normandeau Associates, Inc., will serve as **Biological Laboratory Task Leader** specializing in **benthic invertebrate and zooplankton analyses**. Mr. Dancewicz-Helmers has 18 years of experience in aquatic biology, in both marine and freshwater environments. He is experienced in invertebrate and plankton taxonomy.

Joseph N. Strube, a Fishery Biologist/Senior Taxonomist with Normandeau Associates, Inc., will serve as **Biological Laboratory Task Leader** specializing in **ichthyoplankton analyses**. Mr. Strube has 26 years of experience in fisheries-related work. In addition to his expertise in fisheries field studies, ichthyoplankton, and juvenile fish taxonomy.

Carmela L. Tombes, President and Laboratory Director of Air, Water & Soil Laboratories, Inc. (AWS), a Women-Owned Business Enterprise, will serve as **Water Quality Laboratory Task Leader**. Ms. Tombes has more than 12 years of experience in environmental laboratory analytical testing and regulatory compliance.

John B. Thelen, a Project Scientist with BBL, will serve as **Environmental Conditions Report Task Leader**. Mr. Thelen has more than 5 years of professional experience in environmental science, including ecological assessments, field investigations, feasibility studies, and environmental management system development.

In addition, this team will be supported by a Technical Advisory Team comprising highly qualified individuals in specialized areas of expertise:

David F. Ludwig, Ph.D., a Principal Scientist with BBL, will serve as a **Project Advisor** in the areas of **aquatic ecology and adaptive management**. Dr. Ludwig is an ecologist with 21 years of experience innovating cost-effective, protective solutions to natural resource damage assessment (NRDA), ecological risk assessment, ecotoxicology, and environmental management problems.

Joseph K. Shisler, Ph.D., a Principal Scientist with BBL, will serve as a **Project Advisor** in the areas of **wetlands and restoration ecology**. A nationally recognized wetlands expert, Dr. Shisler has more than 30 years of experience in the area of wetlands management. He is the former president of Shisler Environmental Consultants, Inc. in Perrineville, New Jersey, and was formerly at Rutgers University for more than 15 years, where he directed research on the management of wetlands, stormwater management, and wetland mitigation.

Ram K. Mohan, P.E., Ph.D., a Principal Engineer with BBL, will serve as a **Project Advisor** in the area of **dredge materials management and coastal engineering**. Dr. Mohan has more than 15 years of nationwide experience in dredging, dredged material management, contaminated sediments, marine geotechnical, coastal, and port engineering projects. He is a member of the prestigious National Research Council's Ocean Studies Board and is currently appointed on a congressional study to peer-review the USACE.

D. SPECIAL QUALIFICATIONS

BBL believes that the strength of our team and its ability to successfully implement this project lies not only with our extensive experience and capabilities in conducting ecological field investigations, but also in the fact that our company has extensive experience in the full suite of technical capabilities required to help MES with environmental conditions field studies at potential dredged material placement facilities. BBL offers unique services in restoration planning and design, based strongly on our practice areas of sediments, ecosystem restoration, engineering, and construction services. We offer our clients unparalleled service in coastal, river, dredging, and port engineering through our nationally recognized experts and broad-based experience in all aspects of river, port, and harbor projects. The experience of our personnel includes all of America's coasts (including the Great Lakes) and spans most major rivers, harbors, and ports. We assure our clients practical and economical solutions to their coastal, river, dredging, and environmental engineering needs.

Capabilities of our firm's coastal and port engineering practice include conceptual studies (field and technical), project feasibility studies, working group and agency coordination, geotechnical investigation and analysis, engineering design, permit applications, plans and specifications, contract documents, cost estimates, and project management.

Our personnel are experienced in almost all major rivers, waterways, ports, and harbors. We have worked on some of the nation's largest dredging, coastal, and river engineering, land reclamation, and wetland construction/restoration projects. BBL's existing practice in sediment management, wetland ecology and science, remedial services, and environmental services nicely complement and strengthen our capabilities in coastal and river engineering. With this expertise, we offer our clients exceptional service in coastal and port engineering.

Environmental Analyses

We are completely familiar with the typical environmental analyses required for dredging and dredged material disposal projects, including the development of the required National Environmental Policy Act (NEPA) documentation. Our engineers, hydrologists, scientists, and field specialists contribute multi-dimensional skills to provide the technical expertise to develop, execute, and interpret authoritative sediment and water column investigations. These investigations involve the collection and interpretation of physical, chemical, and biological parameters to support the goals of the project, as well as in the design and implementation of final site controls.

A properly conducted field sampling program is critical for collecting accurate, reliable, and defensible data for any site. BBL's own Field Services Divisions consist of highly qualified, appropriately trained field technicians who are experienced in conducting field sampling programs for all types of media, from suspended and bed sediment, surface water, and floodplain soil to fish, reptiles, invertebrates, and small mammals at sediment sites.

BBL's experience conducting authoritative sediment and surface-water investigations translates into cost and time savings for clients. This experience also enables us to design data collection and exit strategies to cost-effectively resolve some potentially troublesome issues at sediment sites. Since our personnel have designed and implemented investigations and remedies at dozens of sediment sites, we have gained the knowledge and expertise to promote efficient, cost-effective, and innovative investigation strategies for our clients.

Site Investigation and Assessment

Staffed by some of the nation's foremost professionals in the management of aquatic sites, BBL's team has the expertise to develop and execute comprehensive sediment, biota, and water column investigations. These investigations can involve the collection and interpretation of physical, chemical, and biological parameters to support a range of client goals, including regulatory needs and litigation support.

To promote authoritative investigations, BBL's in-house Field Services Division and Aquatic Specialists draw on their experience performing investigative programs at a variety of aquatic sites. Similarly, our Risk Assessment Specialists and Toxicologists combine their in-depth understanding of environmental issues with practical experience conducting risk assessments to provide complete risk characterization and analysis services.

Our services in this area include: site investigation design, work plan development, computer modeling, investigation of sediment contamination, contaminant transport investigations, sampling, analysis, and interpretation of contaminant levels in biota, air pathway analyses, and ecological and human health risk assessments.

Ecological and Wetlands Assessment, Mitigation, and Restoration

Wetland assessments and mitigation plans are often required to obtain permits to conduct construction activities and to facilitate our clients' needs. BBL provides a full range of wetlands assessment, mitigation, and restoration services. Our scientists and engineers have expertise in aquatic and terrestrial ecology, wetlands plant identification, soil classification, wetlands hydrology, and development of wetland mitigation plans and wetland enhancement/creation designs.

Specifically, BBL's scientists have prepared various ecological mitigation plans in support of permitting efforts in sensitive environments (e.g., critical habitat areas, threatened/endangered species propagation and recreation areas). BBL has established relationships with various universities and recognized experts to enhance our capabilities as needed. BBL's scientists use computer-assisted systems, such as geographic information systems (GIS) to characterize wetlands and analyze potential impacts to wetlands. We direct these services to efficiently provide information to our clients while satisfying local, state, and federal regulations, policies, and guidelines.

In concert with our wetlands assessment and delineation capabilities, BBL provides design and construction observation services for wetlands restoration projects. Our scientists work closely with our design and construction engineers to devise and implement effective plans for mitigating impacts to wetlands areas. Our services include wetlands definition and delineation, wildlife and vegetative surveys, identification and mapping of hydric soils, wetlands habitat characterization, wetlands mitigation/enhancement, wetlands restoration, and wetlands permitting (state and federal).

Sediment Management

A cornerstone in BBL's environmental practice is our sediment management capabilities at aquatic sites. Whether the site involves a small creek or an entire river and harbor system, BBL's staff of engineers, scientists, and field specialists conducts field investigations, evaluates potential risks, assesses remedial options, and devises an effective response program.

BBL's staff includes environmental professionals experienced in the investigation and management of contaminated sediment sites affected by various constituents, including polychlorinated biphenyls (PCBs), pesticides, dioxins, organic solvents, polycyclic aromatic hydrocarbons (PAHs), organic metals, and other inorganics. The areas of specialization of our staff include ecology, ecotoxicology, national resource economics, hydrology, geology, environmental systems analysis, environmental chemistry, analytical chemistry, and civil, chemical, and environmental engineering. This core group collaborates continuously with staff possessing other technical specializations, including geotechnical, structural, mechanical, and electrical engineering; hydrogeology; toxicology; drafting; and data management.

BBL's goals are to design cost-effective, reliable aquatic studies, and then develop and negotiate a strategy based on technical, public, and financial considerations. All the while, BBL can provide hands-on management of public information and community relations to actively manage your project's public relations agenda. We have a long-standing reputation for supporting cost-effective solutions at river and harbor sites, including negotiations with regulators, focused engineering evaluations, and cost-effective solutions.

Marine Geotechnical Engineering

Our staff routinely conducts preliminary geotechnical investigations for landfills and dredged material placement sites, to determine the geotechnical characteristics, foundation design, and the potential settlement due to the proposed project. These investigations range from simple sediment sample collection/analyses and bottom probing to more sophisticated auger borings and wash borings.

Our MBE goetechnical subconsultant, E2CR, will supplement our capability with their extensive experience in sediment sampling and detailed geotechnical investigations for dredged material placement sites (and laboratory analyses) throughout the Chesapeake Bay.

Coastal Engineering

The experience of our personnel has included river modeling of the Sheboygan River in Wisconsin, contaminant fate and transport modeling of lakes in New York, rock jetty design in California, lake restoration studies in Florida, cap design and modeling for the Rahway River, beach fill design in Massachusetts, hydrodynamic modeling of the Chesapeake Bay, and coastal engineering evaluation for Maryland counties. We provide planning and engineering services on all aspects of river and coastal engineering, including flow and stage modeling, sediment transport, wave analysis and forecasting, beach design and monitoring, coastal structure design, and project management.

Port and Harbor Engineering

BBL personnel have developed comprehensive sediment dredging programs for a variety of port and harbor clients. These programs have included navigational and new construction dredging, dredge permitting, sampling, and testing projects. BBL scientists have also worked on innovative disposal projects, including capping, confined aquatic disposal, wetland restoration, and upland disposal sites. Many of these have served our clients in a beneficial reuse capacity where dredged material was used for a variety of construction and restoration programs.

BBL employs some of the nation's most renowned experts on remedial dredging, as well as navigational dredging. Our personnel are experienced in performing dredging and capping evaluations for the St. Lawrence River and Sheboygan Harbor, designing offshore dredged material containment islands in the Chesapeake Bay, providing material fill and consolidation estimates in Texas, performing wetland restoration design and modeling in the Chesapeake Bay, and designing navigation channels in New York.

We provide assistance to clients on all aspects of port development issues, including: port layout and design, navigation channel design, wetland engineering and design, dredgeability analysis, dredging design, equipment selection, placement site design, environmental studies/EIS, cost estimating, bidding assistance, and project management.

Land Reclamation

To assist clients with innovative site redevelopment programs, BBL provides a wide array of planning, engineering, permitting, and construction services. Whether in the context of Port development, Brownfields redevelopment, or other regulatory programs, BBL can manage the redevelopment process for our clients to revitalize and maximize the value of environmentally comprised properties while reducing economic liability. Specifically, we have been involved in several successful waterfront projects, where river walks, bike paths, wildlife viewing, and other recreational facilities have been designed and constructed.

Our services in this area include: dredge and fill quantity estimates, material balance, equipment selection, transportation analysis, site design, dewatering and consolidation, numerical modeling, cost estimates, and construction management.

Regulatory Interface and Public Relations

Every project team should include environmental engineers and scientists with experience dealing with regulatory agencies, comprehensive knowledge of the regulations governing them, and established professional relationships with agency personnel. From their project experience, BBL personnel have developed strong working relationships and enhanced communication with various regulatory agencies, including the USACE (districts, headquarters, and WES), the USEPA (regional offices as well as headquarters), resource agencies, and the majority of state regulatory agencies. These relationships have allowed for the development and acceptance of reasonable, alternative approaches to solving complex regulatory issues.

In addition, BBL's staff members are also highly qualified to undertake public relations campaigns and prepare materials for distribution to citizens groups and environmental groups on behalf of our clients. We also provide assistance with public meetings and strategy development.

Computer Modeling

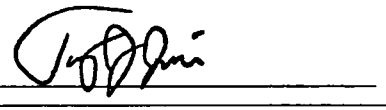
Our modeling group provides high-quality and reliable modeling predictions performed by some of the most recognized experts in the field. Our personnel have modeled complex river systems in the Great Lakes region, analyzed cap stability on the East and West Coasts, performed hydrodynamic modeling in the Chesapeake Bay, performed dredged material disposal modeling in California, modeled material consolidation and settlement in Texas, and modeled sedimentation in New York Harbor.

Our staff is experienced in several modeling software, including, PSDDF (consolidation), ACES (coastal and structure design), SMS (RMA-2 – hydrodynamics, and SED-2D – sediment transport), DREDGE, ADAMS (dredging and disposal), SETTLE (CDF design), EFQUAL (effluent quality), STFATE, MDFATE and LTFATE (disposal plume effects), HELP (landfill caps), CORMIX (mixing), and several others.

Our services include river flow and wave modeling, hydrodynamic and sedimentation modeling, coastal erosion modeling, pipeline transport of solids, dredging and dredged material disposal modeling, environmental effects of dredging, contaminant fate and transport modeling, contaminant migration through in-situ caps, long-term performance of landfill caps, turbidity modeling, consolidation and settlement modeling, and CDF/Landfill modeling.

E. SUMMARY

BBL provides environmental consulting and field work investigation services at numerous aquatic and terrestrial sites across the country. We have an in-depth understanding of relevant issues and the technical expertise to recommend practical, technically feasible solutions. Furthermore, we are able to respond to client needs within tight deadlines (and within budget) while maintaining the high quality of our work.

11. The foregoing is a statement of facts.		Date:
Signature: 	Typed Name and Title: Timothy J. Iannuzzi, Principal Ecologist	February 5, 2003

Section 3

Project Technical Approach

BBL®
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engineers & scientists

consultants with focus

Section 3

Project Technical Approach

Introduction

Blasland, Bouck & Lee, Inc. (BBL) is pleased to provide this proposal to Maryland Environmental Services (MES) to conduct Feasibility-Level Environmental Conditions Studies for a Potential Island Restoration Project at Barren Island, Dorchester County, Maryland. BBL is a national leader in environmental science and engineering work (ranked 34th on *Engineering News Record's* [ENR's] list of Top 200 Environmental Firms), with a long and successful history on similar projects. We believe that BBL's leadership and expertise in sediment and dredge materials management and ecological restoration, coupled with our extensive experience in conducting a wide variety of ecological and water/sediment quality field studies, allows us to bring the best possible team to help MES move forward with a program to collect the data and information that are critical to achieving the goal of a successful restoration of Barren Island.

BBL will be the primary consultant on this project, responsible for the development and implementation of the field studies and the conduct of follow-up data analyses and reports. Our subconsultants, Normandeau Associates, Inc., Air, Water & Soil Laboratories, Inc., and E2CR, Inc., will provide the laboratory analytical services that are required to complete this project. We are pleased that our proposal includes two MBE/WBE business enterprises. The estimated participation in these categories totals about 18.5% of the estimated cost of this work.

The BBL Team is highly qualified to perform the required tasks under this proposal. Our team provides a broad base of specialized experience in all aspects of the project, including fisheries, benthic and wildlife biology, aquatic ecology, hydrodynamics of marine and estuarine systems, wetlands and terrestrial ecology, water and sediment chemistry, restoration ecology and engineering, statistics, and data management. We believe that our team meets and exceeds all of the Selection Criteria factors set forth by MES.

Understanding MES' Needs

The Port of Baltimore relies on its 246 miles of channels to allow ships to make their way to Baltimore from Delaware Bay, Norfolk, and the Atlantic Ocean and vice versa. Of the 246 miles of channels, approximately 130 miles require maintenance dredging on a semi-regular basis. Approximately 3,500,000 cubic yards per year (cy/yr) of maintenance material (excluding new work) is dredged from the Approach Channels and placed within the confines of Hart-Miller Island and Poplar Island.

It is anticipated that Hart-Miller Island has only a few years of capacity remaining, and Poplar Island is filling faster than anticipated. It was planned that Site 104 (proposed open water placement site located north of the Chesapeake Bay Bridge) would help relieve the pressure from the two islands by accepting clean material from the Outer Harbor Channels and portions of the C and D Approach Channels. However, opposition

and environmental scrutiny surrounded the project, which forced the Port to seek alternative methods for disposal of the material.

Barren Island has been identified as a potential habitat restoration/dredged material placement facility development project similar to the current Poplar Island project. For the Barren Island project to be further developed, it is important to understand the existing environmental conditions that exist within the proposed area of the project and to evaluate the likely success of the proposed project in enhancing the local ecosystem. In order to design and implement a sound restoration plan for Barren Island, the benefits of the project will need to be quantified. This can only be accomplished by having a team that understands both dredge materials management (particularly in the Chesapeake Bay) and the science and engineering of ecological restoration. BBL's scientists and engineers have extensive experience in the management of dredge materials/sediments, design and construction of dredge materials placement facilities (including Poplar Island and Hart-Miller Island), and in designing and implementing successful ecological restoration plans.

Because we understand that a sound restoration plan can only be accomplished if it is founded on high quality data and information, we have assembled a high quality team and approach to field data collection and analysis. The BBL Team understands the scope of this project, as well at its unique importance for MES assistance with the long-term management plan for dredge materials from the Port of Baltimore. Our team consists of enthusiastic experts that are credible and well respected in the scientific and regulatory community. Included on the team are several ecologists with expertise in the requisite disciplines covered under this proposal, including fisheries and benthic ecology, avian biology, sediment and water quality, and wetlands and terrestrial ecology. The proposed field sampling team will be managed and advised by senior level staff with experience in restoration projects such as that proposed for Barren Island. Through the application of practical scientific and engineering principles, we will deliver sound deliverables that represent a new level of cost-effectiveness and environmental acceptability for MES and the Chesapeake Bay region.

Technical Approach

Task 1 - Task Management and Status Reports

BBL's project manager will provide MES with weekly updates on the status of the various tasks and subtasks that comprise the project. We envision that this will include an email status report sent to the MES project manager followed by a telephone conversation between the BBL and MES project managers to discuss the status report and any other aspect of the project as necessary. In addition, BBL will generate and submit to MES periodic detailed project status reports. These reports will include updates from the field team (regarding the progress of sampling events), laboratory subcontractors (regarding the progress of analytical work), and the environmental conditions report task leader (regarding the status of literature reviews and progress on sections of the report), as well as project management updates on schedule and budgets. BBL uses Microsoft™ (MS) Office Suite (particularly MS Word, MS Excel, and MS Powerpoint) as our standard company-wide software package for developing reports for our clients. All electronic information provided to MES related to project management will be generated and delivered in MS Office Suite format.

Task 2 - Meetings and Conference Calls

BBL will participate in project meetings and conference calls as required during the implementation of the environmental conditions study. These include project management meetings, project presentations meetings, and potential meetings with any committee groups as required. Because BBL's project manager and and primary task leader are located in our Annapolis, MD office, we will be able to respond quickly to MES's request for such meetings. If necessary, subcontractor task leaders can be called in to attend such meetings/calls. However, because the subcontract work in this proposal is limited to laboratory analytical services, we do not anticipate the need for attendance of the subcontractors at meetings. As stated in the Request for Proposal (RFP), we have assumed that a total of four meetings and/or conference calls will take place for the purpose of providing a cost estimate. Our cost estimate is based on a meeting/call duration of 4 hours each.

Task 3 - Presentation Development

Upon request, BBL will develop and deliver presentations on the environmental conditions studies and related feasibility assessments associated with the project. These presentations will be developed using MS Powerpoint and delivered both electronically and in hard copy to MES. These types of presentations are typically developed in our Annapolis, MD office. As such, we would also be available to review, edit, and deliver these presentations together with MES on short notice as required. As requested in the RFP, we have included cost estimates for the development of one presentation in this proposal.

Task 4 - Environmental Conditions Field Study and Analysis

BBL has developed and attached to this proposal a draft Field Sampling Plan (FSP) for the environmental conditions studies at Barren Island (see Appendix A). The draft FSP contains our approach to implementing the field sampling program under Task 4. It was based on the scope of services outlined in the RFP and more specifically contained within the example FSP that was attached to the RFP.

Although the scope of services (in terms of sample locations, numbers, and field study types) in BBL's FSP is the same as that provided by MES, we have attempted to incorporate some clarifications and additional perspectives on how the sampling will be accomplished and to recommend alternate approaches for specific study elements based on our field experience. If selected to perform these studies, BBL anticipates revising and augmenting this draft FSP to incorporate any requirements that MES may have that were not specified in the proposal, as well as any additional information that MES can provide regarding other similar studies that have been performed previously for the Barren Island project or other islands in the Chesapeake Bay (i.e., Mid-Bay Island Feasibility Project Management Plan, etc.).

The final FSP that is developed for the Winter and Spring 2003 environmental conditions studies will include a Quality Assurance Project Plan (QAPP) and a Health and Safety Plan (HASP). The QAPP will contain the field and laboratory procedures and criteria for successful completion of the field sampling and analysis program. It will also contain the field and laboratory documentation procedures and associated field and laboratory data and QA/QC forms. Further discussion of the HASP is provided in the Safety Management section of this proposal.

In order to provide MES with sufficient detail to appropriately evaluate this proposal and our related cost estimates for the various tasks included herein, BBL's estimates for implementation of the environmental conditions studies (i.e., Task 4) are broken down into nine subtasks, as follows:

1. Development of final Field Sampling and Analysis Plan, including Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP)
2. Mobilization and Demobilization for Winter and Spring 2003 field studies
3. Water quality analyses (Winter and Spring)
4. Sediment quality analyses (Spring)
5. Plankton/Ichthyoplankton surveys (Winter and Spring)
6. Benthic community assessment (Spring)
7. Fisheries surveys (Winter and Spring)
8. Habitat, submerged aquatic vegetation (SAV), and avian surveys (Winter and Spring habitat and avian surveys/Spring SAV survey)
9. Acquisition and review of existing data and reports relevant to the Barren Island restoration feasibility study

In doing this, we have tried to strike a balance between providing sufficient detail regarding the various study elements that are required under the RFP, yet combine those tasks that will likely be performed simultaneously. The first eight subtasks encompass the primary activities that will need to be performed in order to successfully execute the environmental conditions field investigation.

The field sampling work will be conducted using standard sampling protocols that are comparable to those used by the U.S. Environmental Protection Agency's (USEPA's) Chesapeake Bay Program and Maryland Department of the Environment (MDE). The QAPP that is developed will be based on the USEPA's *Recommended Guidelines for Sampling and Analysis in the Chesapeake Bay Monitoring Program* (August, 1996). This document provides guidelines, requirements, and procedures for field measurements and laboratory analyses, including QA/QC protocols.

Subtask 9, acquisition and review of existing data and reports, will be initiated at the outset of the project and will help guide final sampling design, as well as gather the necessary information to fully characterize the Barren Island environs from both a current and historical perspective. This information gathering will be critical to the overall success of the feasibility study in terms of developing a restoration plan that will have the highest likelihood of success and that fully conforms with National Environmental Policy Act (NEPA) guidelines and criteria.

BBL will review the existing data and information that are collected relative to the proposed sampling and analysis plan. As necessary, we will make recommendations to MES as to additional data that may be required to support the development of a sound restoration plan for Barren Island. BBL will work with MES and any other firms or agencies that are part of the Barren Island team in order to ensure appropriate information transfer between team members, maximize technical resources for developing a sound restoration plan, and maximize cost efficiency for MES.

Task 5 - Quarterly Report Generation

BBL will prepare two quarterly data reports following the Winter and Spring sampling, respectively, as specified in the RFP. These reports will be used to present the data findings to date with respect to the goals of determining the feasibility of the proposed Barren Island restoration project. The data reports will include the following key components:

- Executive summary of pertinent data and information findings to date regarding feasibility of the proposed restoration project;
- Assessment of environmental conditions at the site based on data and information collected to date; and
- Photographic log of the site during the field sampling event.

As part of these reports, BBL will also summarize the updated historical and current information base that we have collected regarding the ecology and physiography of Barren Island and the surrounding environs. This type of information will be key to conducting the environmental impact portion of the feasibility study, as well as in the design of the actual restoration plan. Therefore, it will be important for MES to understand what information we have obtained in this regard and how it impacts the overall project (including guiding future information/data collection efforts).

Eight (8) copies of each data report will be submitted to MES in both electronic (CD) and hard copy formats. Electronic versions of the reports and related materials will be submitted in MS Office Suite format.

Task 6 - Consolidated Report Generation

Once the Winter and Spring sampling events are complete and BBL receives the final data packages from the analytical laboratories, as well as the pop net study results from Andrews Miller and Associates (AM), we will develop and submit for MES review a draft Consolidated Feasibility Conditions Report. This report will include the consolidated and integrated results from the following studies:

- Summer 2002 environmental conditions study (EA)
- Fall 2002 environmental conditions study (EA)
- Winter 2003 environmental conditions study (BBL)
- Spring 2003 environmental conditions study (BBL)
- Spring 2003 pop net study (AM)
- Historical reports, documents, maps, data, etc., for Barren Island environs

The latter information (i.e., historical data and information) will be gathered during the implementation of the BBL environmental conditions study. It is likely that a substantial portion of this information has been gathered in the past and will be obtained through an information transfer from MES, as well as existing contractors to MES (i.e., EA, AM, etc.). The focus of the historical data and information gathering will be broad and will include the information base that is of interest to the NEPA process, particularly to the generation of environmental impact statements (EIS). This includes, but is not limited to, general biological/ecological information (aquatic, wetland, and terrestrial), threatened and endangered species assessments, essential habitat (fish, shellfish, birds, etc.) information, physicochemical characteristics of water and sediment (including contaminant characterizations), historical and cultural resources, economic issues (e.g., human use values), aesthetics and noise, and other local and regionally important issues in the middle Chesapeake Bay.

The draft report will be a detailed integrated assessment of the data and information that have been collected to date. The format will be similar to a NEPA EIS in order to lay out the data and information into an understandable format that is focused on interpreting the findings with respect to the feasibility of implementing the proposed restoration project for Barren Island. In this regard, the report can also be used to aid in the design of the actual restoration project in terms of identifying important resources that should be included or considered in the project specifications.

To complete the consolidated report, BBL will first compile the full MES dataset (including data collected from the Fall of 2001 through the Spring of 2003) into an electronic database (MS Access or MS Excel) and/or related speadsheets for analysis. The database(s) will be broken down by the following elements:

- Water quality data – *in situ* measurements
- Water quality data – nutrients and chemistry
- Sediment quality data – geotechnical characteristics
- Sediment quality data – contaminant chemistry

- Zooplankton data – sum totals by lowest reported taxa
- Ichthyoplankton data – sum totals by lowest reported taxa
- Benthic invertebrate data – sum totals by lowest reported taxa
- Benthic invertebrate data – indices of composition and structure, and Chesapeake Bay Index of Biotic Integrity
- Fish and blue crab data – sum totals by species
- Fish and blue crab data – physical measurements (e.g., length)
- Vegetation data – species lists and aerial estimates as appropriate
- Habitat data – types and aerial estimates as appropriate
- Miscellaneous data as appropriate

Following data compilation, BBL will conduct a detailed data analysis focused on generating the necessary assessment of the data to evaluate the feasibility of the proposed restoration project at Barren Island. In addition, BBL will provide interpretation as to what types of habitat and ecosystem restoration options might provide the best functional value of the island.

The data analyses will include the generation of multiple sets of summary statistics for the water/sediment chemistry and biological parameters. Population and community data will be presented and discussed on a seasonal basis for the various aquatic organisms studied under the MES program. Bird and wildlife use of the remnants of the Barren Island and, more importantly, specific habitats on or adjacent to the island will be characterized. These data will be supplemented with data and information that are collected from historical sources and other studies. This type of population-habitat use information will be very important in helping to guide the design of specific habitat restoration plans for the island.

In addition, a number of community indices will be calculated to evaluate the condition of the benthic community surrounding Barren Island relative to other areas in the Chesapeake Bay. The Chesapeake Bay Benthic Index of Biotic Integrity (B-IBI), initially developed by Weisberg et al. (1997), will be the primary method used to evaluate benthic invertebrate communities collected from Barren Island. The overall approach is premised on a scoring for each of several attributes (metrics) of benthic community structure and function (abundance, biomass, diversity, etc.). Not all of the metrics involved in the calculation of the B-IBI are relevant to the habitat conditions that are present at Barren Island; however, previous studies have indicated that the substrate is likely to be sand or mud in a high mesohaline environment (Weisberg et al. [1997] and ICPRB [1999]). Therefore, the appropriate B-IBI metrics for high mesohaline sand and mud substrates are:

- Shannon-Wiener H'
- Abundance (No. organisms/m^2)
- Biomass (g/m^2)
- Abundance and Biomass of pollution-indicative taxa (%)
- Abundance and Biomass of pollution-sensitive taxa (%)
- Abundance of carnivores/omnivores (%)
- Biomass deeper than 5 cm (%)[1]

[1] Estimates of biomass for this metric can be based on the functional life histories of the organisms and will not be measured directly in the field.

Scores for each of these metrics are numerically assigned a 5, 3, or 1 depending on the degree of deviation from reference sites (Weisberg et al. 1997). The final B-IBI scores are derived by summing the individual scores for each metric and calculating an average score or B-IBI value. These are then compared to numeric thresholds that rank the benthic community condition as reported by Llanso et al. (2002a,b,c). These scores will provide a means to determine the condition of benthic communities adjacent to Barren Island.

Once the final data analyses are complete, the draft report will be assembled. The draft report will include an executive summary of the pertinent findings, a description and interpretation of the integrated data results and related information regarding the Barren Island environs, photographic logs of the site and sampling activities by season and year, and appropriate attachments and appendices of data reports, publications, maps, etc., from previous studies.

BBL will incorporate up to two rounds of MES comments on the draft report and produce a final Consolidated Feasibility Conditions Report. Eight (8) copies of the draft report will be submitted to MES in both electronic (CD) and hard copy formats. Twelve (12) copies of the final report will be submitted to MES in both electronic (CD) and hard copy formats. Electronic versions of the reports and related materials will be submitted in MS Office Suite format.

References

Llanso, R.J. and D.M. Dauer. 2002a. Methods for calculating the Chesapeake Bay benthic index of biotic integrity. 24 pp.

Lllanso, R.J., L.C. Scott, D.M. Dauer, J.L. Hyland, and D.E. Russell. 2002b. An estuarine benthic index of biotic integrity for the Mid-Atlantic Region of the United States. I. Classification of assemblages and habitat definition. *Estuaries*. 25:6A 1219-1230.

Lllanso, R.J., L.C. Scott, D.M. Dauer, J.L. Hyland, D.E. Russell, and F.W. Kutz. 2002c. An estuarine benthic index of biotic integrity for the Mid-Atlantic Region of the United States. II. Index development. *Estuaries*. 25:6A 1231-1242.

Weisberg, S.B., J.A. Ranasinghe, D.M. Dauer, L.C. Schaffner, R.J. Diaz, and J.B. Frithsen. 1997. An estuarine benthic index of biotic integrity (B-IBI) for the Chesapeake Bay.

Management Approach

BBL's management approach is centered on our corporate philosophy "to provide our clients with unparalleled service." For the Barren Island project, BBL will provide unparalleled service to MES through the following management approach. Our approach is founded on listening to you and assembling the best team of technical personnel to address your needs. There is no substitute for active listening. We seek a complete and thorough understanding of your vision of how this work should proceed. Our communication does not end there, however. We will actively reach out to you throughout the duration of the project to ensure that we stay on track. Internal communication, within BBL and with our subconsultants, is similarly thorough and bi-directional.

Our management approach is supported by a highly advanced information technology infrastructure within BBL. Along with the routine expectations of telecommunication and electronic data transmittal, BBL maintains unique systems for project safety, quality control, quality assurance, electronic cost tracking and billing, and document management. Throughout the project life cycle, we are driven to provide unparalleled service, and we possess the skills and tools to make it happen.

Project Organization Chart

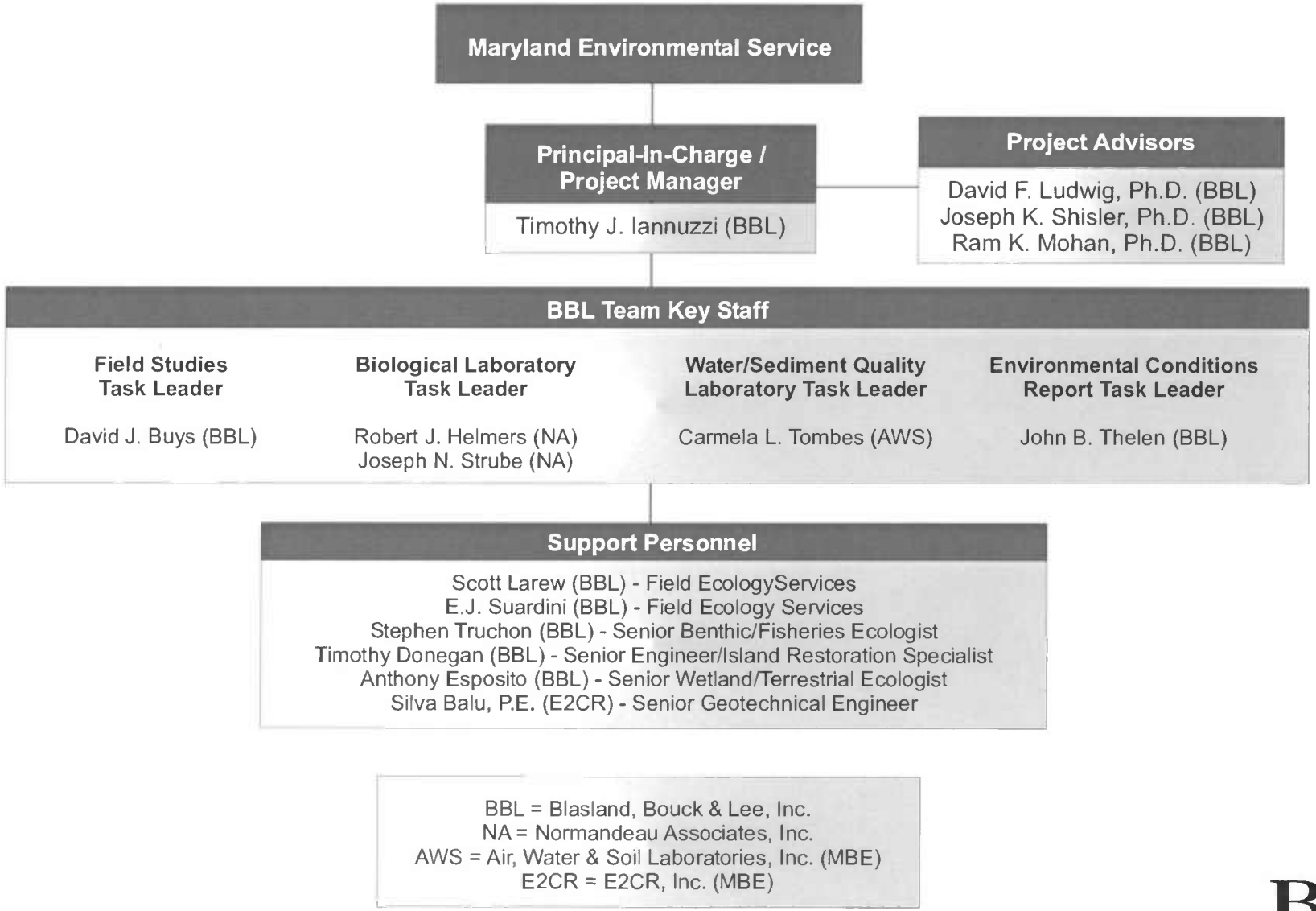
BBL's **project organization chart** identifying our proposed project team is provided on the following page. Brief summaries are provided below of our key management and technical personnel. Resumes of all personnel shown on the organization chart are provided in the SF 255 form presented in Section 2 of this proposal.

Timothy Iannuzzi, a Principal Ecologist with BBL, will serve as **Principal-In-Charge/ Project Manager** and will be the **contact person for MES** on all aspects of program management, contract management, and schedule issues. Mr. Iannuzzi is the Office Manager of BBL's Annapolis, MD office. He is a scientist with more than 14 years of research and consulting experience. His project work and management experience ranges from screening-level environmental assessments to large-scale risk assessments, natural resource damage assessments, and NEPA environmental impact evaluations. Mr. Iannuzzi's technical experience includes performing ecological investigations in marine/estuarine, freshwater, and wetland/terrestrial systems. This includes managing a number of large-scale field investigation programs. He has worked at a wide range of sites, including many sediment management projects, more than 20 Superfund sites, U.S. Department of Defense facilities, the U.S. Department of Energy Savannah River Facility, industrial manufacturing facilities, and RCRA sites. He specializes in investigating the effects of urbanization and industrialization on aquatic systems, and conducting risk-based evaluations of the effects of chemical contaminants on environmental receptors.

On matters related to technical implementation and specialty areas of the project, Mr. Iannuzzi will be assisted by the following Project Advisors and Task Managers.

Organization Chart

Barren Island Environmental Conditions Study
MES Contract No. 03-07-22



BBL = Blasland, Bouck & Lee, Inc.
NA = Normandeau Associates, Inc.
AWS = Air, Water & Soil Laboratories, Inc. (MBE)
E2CR = E2CR, Inc. (MBE)

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Project Advisors

David F. Ludwig, Ph.D., a Principal Scientist with BBL, will serve as a **Project Advisor** in the areas of **aquatic ecology and adaptive management**. Dr. Ludwig is an ecologist with 21 years of experience innovating cost-effective, protective solutions to natural resource damage assessment (NRDA), ecological risk assessment, ecotoxicology, and environmental management problems. Dr. Ludwig is trained in systems ecology, marine/estuarine ecosystems, and invertebrate ecology. He has managed diverse environmental programs, in both the continental United States and overseas, ranging from focused specialty tasks addressing single technical issues to complex, multidisciplinary programs exceeding $1 million. Dr. Ludwig has implemented many field and laboratory investigations addressing potential natural resource damages, and the ecological effects of organic and inorganic chemicals in aquatic and terrestrial environments. He has supervised the development of successful data analysis applications using statistical tools, transport and fate analyses, modeling techniques, and exposure projection to support private sector clients facing numerous regulatory and legal challenges.

Joseph K. Shisler, Ph.D., a Principal Scientist with BBL, will serve as a **Project Advisor** in the areas of **wetlands and restoration ecology**. A nationally recognized wetlands expert, Dr. Shisler has more than 30 years of experience in the area of wetlands management. He is the former president of Shisler Environmental Consultants, Inc. in Perrineville, New Jersey, and was formerly at Rutgers University for more than 15 years, where he directed research on the management of wetlands, stormwater management, and wetland mitigation. Dr. Shisler has been a consultant to various state, federal, and international agencies concerning wetlands and stormwater management issues, and he has published more than 125 papers on the subject. Dr. Shisler's work was recognized by the New Jersey Wildlife Society, which presented him with the 1980 Conservationist of the Year award. Dr. Shisler evaluated the wetlands on Staten Island for the New York Department of Environmental Conservation (NYSDEC). Governor Kean appointed him chairperson of the New Jersey Wetlands Mitigation Council in 1989. Dr. Shisler is a certified Professional Wetland Scientist by the Society of Wetland Scientists and a Senior Ecologist by the Ecological Society of America.

Ram K. Mohan, P.E., Ph.D., a Principal Engineer with BBL, will serve as a **Project Advisor** in the area of **dredge materials management and coastal engineering**. Dr. Mohan has more than 15 years of nationwide experience in dredging, dredged material management, contaminated sediments, marine geotechnical, coastal, and port engineering projects. He is a member of the prestigious National Research Council's Ocean Studies Board and is currently appointed on a congressional study to peer-review the USACE. He has national experience in dredging, dredged material management, CDF design, and contaminated sediments, including involvement in several projects for the MES/MPA, such as Upper Bay Islands, Hart Miller Island, CSX/Cox Creek, Poplar Island, Sharps Island, and Aberdeen Proving Ground. Dr. Mohan is the author of over 100 publications in civil, dredging, and coastal engineering.

Task Leaders

David J. Buys, a Project Scientist with BBL, will serve as **Field Studies Task Leader**. Mr. Buys has extensive experience in managing and implementing ecological field investigations. His particular area of expertise is aquatic ecology, primarily fisheries and benthic ecology. Mr. Buys provides direction in the laboratory and field, including management of personnel and equipment. He designs and implements long-term field studies and provides statistical analyses and data evaluation of data.

Robert J. Dancewicz-Helmers, a Senior Taxomist with Normandeau Associates, Inc., will serve as **Biological Laboratory Task Leader** specializing in **benthic invertebrate and zooplankton analyses**. Mr. Dancewicz-Helmers has 18 years of experience in aquatic biology, in both marine and freshwater environments. He is experienced in invertebrate and plankton taxonomy.

Joseph N. Strube, a Fishery Biologist/Senior Taxonomist with Normandeau Associates, Inc., will serve as **Biological Laboratory Task Leader** specializing in **ichthyoplankton analyses**. Mr. Strube has 26 years of experience in fisheries-related work. In addition to his expertise in fisheries field studies, ichthyoplankton, and juvenile fish taxonomy, Mr. Strube is also experienced in marine and freshwater zooplankton taxonomy. Mr. Strube's other responsibilities include project management, supervision of field and laboratory personnel, and quality control procedures.

Carmela L. Tombes, President and Laboratory Director of Air, Water & Soil Laboratories, Inc. (AWS), a Woman-Owned Business Enterprise, will serve as **Water and Sediment Quality Laboratory Task Leader**. Ms. Tombes has more than 12 years of experience in environmental laboratory analytical testing and regulatory compliance. As one of the founders of AWS, Ms. Tombes is jointly responsible for development of the administrative infrastructure, standard operating procedures for analytical testing, and quality assurance operations. Her daily responsibilities include partial oversight of gas chromatograph operations, various wet chemistry analyses, organic data reduction analysis, comprehensive quality assurance data review, and direct management of laboratory personnel.

John B. Thelen, a Project Scientist with BBL, will serve as **Environmental Conditions Report Task Leader**. Mr. Thelen has more than 5 years of professional experience in environmental science, including ecological assessments, field investigations, feasibility studies, and environmental management system development. Mr. Thelen has been involved with environmental and health assessment work pertaining to air, groundwater, surface water, biota, soil and sediment contamination at a number of sites throughout the eastern United States.

Communication with MES, Subcontractors, and Other Agencies

Mr. Iannuzzi will be the principal contact for the client throughout the project. He will orchestrate the delivery and communication of the services that the BBL Team will provide to MES. However, this does not mean that Mr. Iannuzzi will be the sole point of contact. It is understood that other BBL Task Leaders will need to communicate with MES from time to time for efficient technical execution of the project. However, both the BBL and MES project managers will be notified of the details of the communication,

including date and time of the conversation, individuals involved, and a summary list of the topics discussed.

Project Planning

Following execution of an agreement for professional services with MES, BBL will develop a project plan that will address the following:

- **Purpose and Scope**: This will define the overall objectives of the project. It will be used to efficiently guide the project work efforts.
- **Client Information**: This will be used to establish project-specific arrangements for effective communication with MES.
- **Project Team**: This will identify the members of the team and their respective responsibilities and contact information.
- **Scope of Work**: This will include the contracted scope of work agreed upon between MES and BBL.
- **Deliverables**: This section will clearly define each of the deliverables to be generated during the project, summarized by task item.
- **Budget**: The budget allotted for each task item will be identified, including work to be completed by subcontractors.

This plan will be distributed to the members of the team to be used as a guidance document to help achieve (and exceed) the project goals of MES.

Safety Management

Health and safety issues are an integral part of all field activities at BBL. It will be the BBL project manager's responsibility to develop a site-specific HASP for the Barren Island project per OSHA 1910.120.

Site visits and field work require a HASP to be completed by all BBL employees who plan to visit the site, as well as any subcontractors, prior to commencement of the work. BBL has an in-house guideline document for safety issues that was developed based on our considerable experience at similar contaminated sediment sites. The guidelines provide information on the following:

- General Health and Safety Rules
- Hazardous Materials Transportation
- Training
- Medical Evaluation (Physicals)
- Health and Safety Plans
- Respiratory Protection
- Hazard Communication
- Daily Safety Meetings

- Bloodborne Pathogens (Lime Disease, West Nile Virus)

During the finalization of the Field Sampling and Analysis Plan, BBL will prepare a site-specific HASP for the field studies to be conducted at Barren Island.

Document Management

Document management is an integral part of the project management approach. Document management means the management of all files, whether electronic or hard copy, in order to maximize efficiency of file retrieval and minimize potential future liability for our clients and ourselves. Document management is not simply reserved for draft and final reports. It includes, but is not limited to, meeting notes, phone call file memos, letters, reference materials, and electronic mail. BBL has established document management guidelines and will store and manage all documents relevant to the Barren Island project. The specifics of the Document management system for this project will be developed through discussions between BBL's project manager and MES' project manager. This central file system will be consistent and will use file names such as agreements, letters, memos, notes to file, invoices, reports, plans, specifications, etc.

Project QA/QC

The BBL Team is committed to providing quality services and work products to MES. BBL's quality assurance program is well defined, and it is expected that the BBL Team will work to the same standards as set forth by BBL. The basis for our quality assurance activities includes the following principles:

- Quality is the responsibility of all BBL employees and subcontractors, who will strive for continuous improvement.

- All work activities will be planned based on the needs of MES, taking into account the goals and applicable technology and regulatory requirements.

- Each person assigned to this project will be qualified to implement the work activities to which they are assigned.

- Procedures will be developed, documented, and approved for project activities. All such work will be performed and documented in accordance with approved procedures.
- Activities involving the acquisition of data will be planned and documented in order to identify the type, quality, and quantity of data needed for its intended use.

- The procurement and use of materials, equipment, and services that affect the quality of the work will be planned and managed, and must conform to applicable contract, technical, and regulatory requirements.

- All designs, plans, specifications, and other documents will be developed using sound engineering and scientific principles and will meet appropriate industry

standards. All designs, plans, specifications, and other documents will be reviewed, verified, and approved prior to issuance.

- Deviations from planned project activities will be documented and reported to MES as they occur.

- Engineering and scientific activities will be periodically evaluated to verify conformance with quality, technical, and regulatory requirements.

Mr. Iannuzzi will be responsible for developing the project QA/QC program and obtaining the necessary reviews. The QA/QC procedures will be reviewed with BBL Team members, as well as MES, for mutual agreement to adhere to the schedule set forth by MES.

Meetings

BBL will participate in regular meetings and conference calls, as specified in our technical proposal. If applicable, an agenda outline will be distributed to the group one week prior to the meeting for review and comment. The BBL Team will also take meeting notes, keeping track of the dialog, as well as proposed action items. The meeting minutes will be distributed to MES and BBL Team members (as well as others, as requested by MES) for review and comment within 5 working days following the meeting.

Proposed Project Schedule

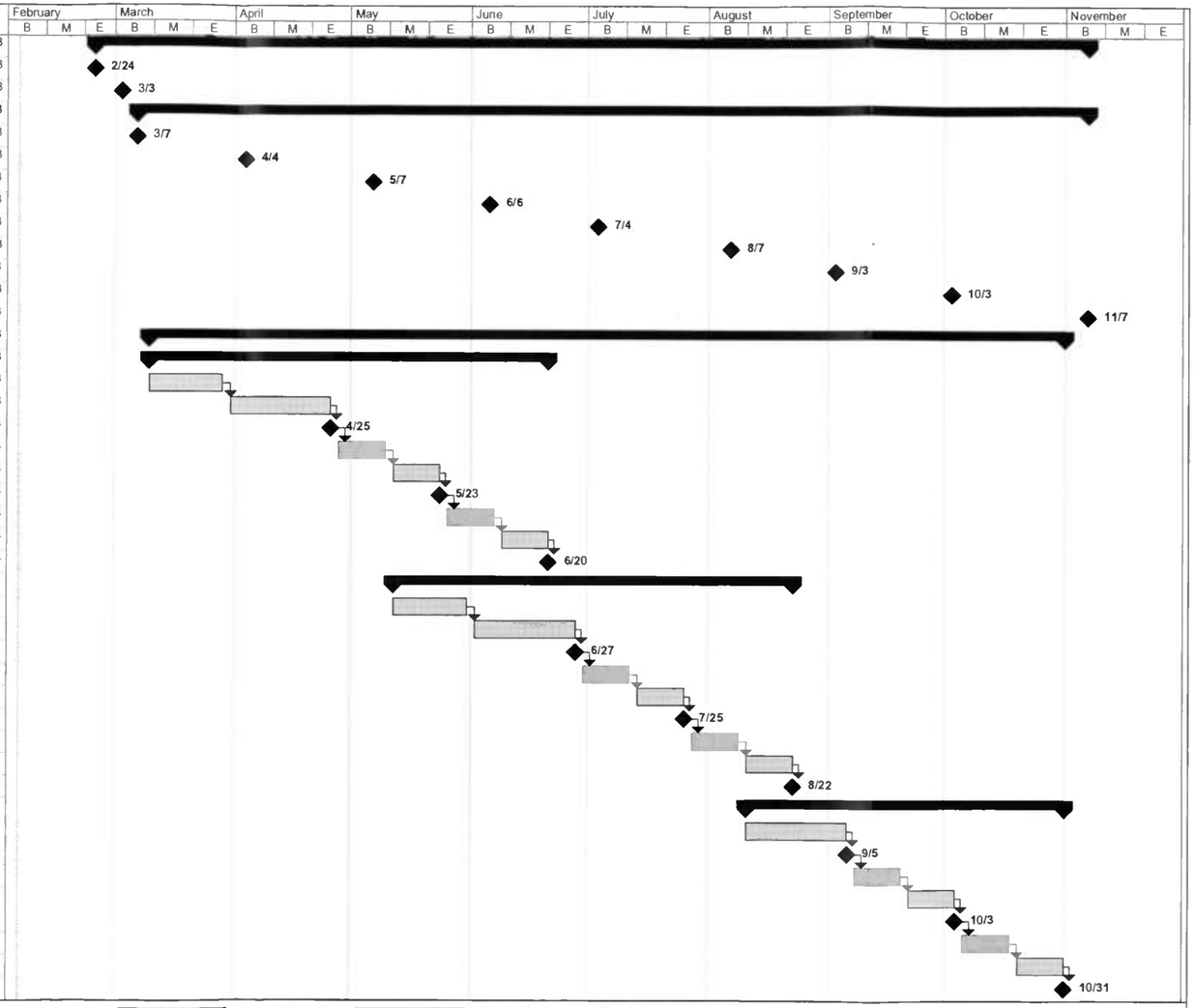
Following a meeting with MES, the BBL Team will work to finalize the **proposed project schedule** (provided on the following page) to comply with the needs of MES. The schedule will be submitted to MES for review and approval. The schedule will account for federal holidays and will provide sufficient time for reviewing major task items. If the schedule needs to be changed, MES will be directly notified. A revised schedule will then be submitted to MES and the BBL Team members as mutually agreed upon.

The proposed schedule is based on a tentative start date of February 24, 2003. The duration was set to 9 months per the specifications regarding the contract that were provided in the RFP. Each seasonal field sampling event (i.e., Winter and Spring) is anticipated to be about 3 weeks in duration. The remainder of the schedule lays out in detail the timeline for interim and final deliverables, as well as project status reports.

Cost Tracking, Invoicing, and Payment

The BBL Team is familiar with MES billing procedures and requirements for the submittal of invoices. The BBL Team will use an electronic billing system to track project costs by task item, employee, and subcontractor. The work performed for the project will be updated every 2 weeks. Should MES require additional information for an invoice, the request can be easily processed by BBL through our electronic billing system.

ID	Task Name	Duration	Start	Finish
1	**Project Schedule and Deliverables**	**184 days**	**Mon 2/24/03**	**Fri 11/7/03**
2	Project Schedule for MES Approval	0 days	Mon 2/24/03	Mon 2/24/03
3	Study Design for MES Approval	0 days	Mon 3/3/03	Mon 3/3/03
4	**Status Reports**	**175 days**	**Fri 3/7/03**	**Fri 11/7/03**
5	February	0 days	Fri 3/7/03	Fri 3/7/03
6	March	0 days	Fri 4/4/03	Fri 4/4/03
7	April	0 days	Wed 5/7/03	Wed 5/7/03
8	May	0 days	Fri 6/6/03	Fri 6/6/03
9	June	0 days	Fri 7/4/03	Fri 7/4/03
10	July	0 days	Thu 8/7/03	Thu 8/7/03
11	August	0 days	Wed 9/3/03	Wed 9/3/03
12	September	0 days	Fri 10/3/03	Fri 10/3/03
13	October	0 days	Fri 11/7/03	Fri 11/7/03
14	**Environmental Data Reporting and Field Work**	**170 days**	**Mon 3/10/03**	**Fri 10/31/03**
15	**Feasibility Env. Cond. Report for Winter 2003**	**75 days**	**Mon 3/10/03**	**Fri 6/20/03**
16	Winter Data Collection	15 days	Mon 3/10/03	Fri 3/28/03
17	Draft Report Preparation	20 days	Mon 3/31/03	Fri 4/25/03
18	Submit Draft Report	0 days	Fri 4/25/03	Fri 4/25/03
19	MES Review and Comment	10 days	Mon 4/28/03	Fri 5/9/03
20	Address Comments and Prepare Final Draft	10 days	Mon 5/12/03	Fri 5/23/03
21	Final Draft Submittal	0 days	Fri 5/23/03	Fri 5/23/03
22	MES Review and Comment	10 days	Mon 5/26/03	Fri 6/6/03
23	Address Comments and Prepare Final	10 days	Mon 6/9/03	Fri 6/20/03
24	Final Draft Submittal	0 days	Fri 6/20/03	Fri 6/20/03
25	**Feasibility Env. Cond. Report for Spring 2003**	**75 days**	**Mon 5/12/03**	**Fri 8/22/03**
26	Spring Data Collection	15 days	Mon 5/12/03	Fri 5/30/03
27	Draft Report Preparation	20 days	Mon 6/2/03	Fri 6/27/03
28	Submit Draft Report	0 days	Fri 6/27/03	Fri 6/27/03
29	MES Review and Comment	10 days	Mon 6/30/03	Fri 7/11/03
30	Address Comments and Prepare Final Draft	10 days	Mon 7/14/03	Fri 7/25/03
31	Final Draft Submittal	0 days	Fri 7/25/03	Fri 7/25/03
32	MES Review and Comment	10 days	Mon 7/28/03	Fri 8/8/03
33	Address Comments and Prepare Final	10 days	Mon 8/11/03	Fri 8/22/03
34	Final Draft Submittal	0 days	Fri 8/22/03	Fri 8/22/03
35	**Consolidated Report**	**60 days**	**Mon 8/11/03**	**Fri 10/31/03**
36	Draft Report Preparation	20 days	Mon 8/11/03	Fri 9/5/03
37	Submit Draft Report	0 days	Fri 9/5/03	Fri 9/5/03
38	MES Review and Comment	10 days	Mon 9/8/03	Fri 9/19/03
39	Address Comments and Prepare Final Draft	10 days	Mon 9/22/03	Fri 10/3/03
40	Final Draft Submittal	0 days	Fri 10/3/03	Fri 10/3/03
41	MES Review and Comment	10 days	Mon 10/6/03	Fri 10/17/03
42	Address Comments and Prepare Final	10 days	Mon 10/20/03	Fri 10/31/03
43	Final Draft Submittal	0 days	Fri 10/31/03	Fri 10/31/03



Project: Project Schedule
Date: Tue 2/4/03

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Items Not Identified in the Scope of Work

Conditions sometimes develop on projects that result in the need for extra services. These conditions are usually in response to information learned during the course of the project. They may also result from a client-directed change. Services that are not identified in the task items agreed upon between the BBL Team and MES will be brought to the attention of MES, and a request will be made as to how to proceed with the change.

Minority Business Enterprise Forms

The following minority business enterprise forms are provided at the end of this section:

- Attachment B – Outreach Efforts Compliance Statement
- Attachment C – Schedule of MBE Participation
- Attachment D – Subcontractor Project Participation Statement

Attachment B

Outreach Efforts Compliance Statement

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Attachment B

MARYLAND ENVIRONMENTAL SERVICE
STATE OF MARYLAND

OUTREACH EFFORTS COMPLIANCE STATEMENT

In conjunction with the bid or offer submitted in response to Project ID No. 03-07-22, I state the following:

1. Bidder/Offeror identified opportunities to subcontract in these specific work categories:

   Laboratory water quality analyses, laboratory sediment chemistry analyses, and laboratory geotechnical analyses.

2. Attached to this form are copies of written solicitations (with bidding instructions) used to solicit certified MBEs for these subcontract opportunities.

   See attached correspondence.

3. Bidder/Offeror made the following attempts to contact personally the solicited MBEs:

   Telephone contact and email correspondence.

4. Bidder/Offeror assisted MBEs to fulfill or to seek waiver of bonding requirements: (*Describe efforts*)

   ☒ This project does not involve bonding requirements.

5. Bidder/Offeror:
   - ☐ did attend the pre-bid conference.
   - ☐ did not attend the pre-bid conference.

   ☒ No pre-bid conference was held.

Blasland, Bouck & Lee, Inc.
Bidder/Offeror Name

6723 Towpath Road, P.O. Box 66
Syracuse, NY 13214-0066
Address

By: _____

H. Larry Vozzo, Senior Vice President/ General Counsel
Name, Title

February 5, 2003
Date

If additional space is required, please attach a separate paper.

Revised 11/6/01

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FAXED 1/30/03

Transmitted Via Fax

January 30, 2003

Carmela Tombes
Air, Water and Soil Laboratories, Inc.
Richmond, VA 23230
P-804-358-8295
F-804-358-8297

Re: Barren Island Water and Sediment Quality Laboratory Analysis

Dear Carmela:

Per our telephone conversation on January 29th, 2003, BBL would like to include Air, Water and Soil Laboratories, Inc (MDOT-MBE Certified) as a subcontractor in our proposal to perform water quality and/or sediment quality laboratory analysis on samples provided to Air, Water and Soil Laboratories, Inc by BBL staff. Please provide us with a price quote to perform the following analysis (attached):

If you have any questions regarding this matter, please feel free to contact me or Tim Iannuzzi at 410.295.1205

Sincerely,

BLASLAND, BOUCK & LEE, INC.

John Thelen
Project Scientist

cc: Tim Iannuzzi, Vice President

(Attachment: 1)

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Water Quality Laboratory Analyses:

total dissolved nitrogen
particulate nitrogen
nitrate
nitrate + nitrite
ammonium
organic nitrogen
total dissolved phosphorus
orthophosphate
particulate carbon
dissolved organic carbon
total N and total P
chlorophyll a and paeophytin a
total suspended solids (TSS)

Sediment Quality Laboratory Analyses:

semivolatiles
chlorinated pesticides
organophosphurus pesticides
PCBs
PAHs
metals
dioxin and furan congeners
butyltins
ammonia
nitrate/nitrite
cyanide
total sulfide
total Kjeldahl nitrogen (TKN)
acid volatile sulfide (AVS)
simultaneously extracted metals (SEM)
total organic carbon (TOC)
total phosphorus
biochemical oxygen demand (BOPD)
chemical oxygen demand (COD)

326 First Street • Suite 200 • Annapolis, MD 21403-2678
Tel (410) 295-1205 • Fax (410) 295-1225 • www.bbl-inc.com • offices nationwide

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FAXED 1/30/03

Transmitted Via Fax

January 30, 2003

Mr. Siva Balu, PE
E2CR, Inc.
9004 Yellow Brick Road, Suite E
Baltimore, Maryland 21237
P-410.574.4393
F-410.574.7970

Re: James Island and Barren Island
Grab Sample Geotechnical Lab Analysis

Dear Siva:

Per our telephone conversation on January 30, 2003, BBL would like to include E2CR (MDOT-MBE Certified) as a subcontractor in our proposal to conduct geotechnical lab analysis on samples provided to E2CR by BBL staff. Please provide us with a price quote to perform the following analysis:

1. Grain Size
2. Atterberg Limits
3. Percent Fines
4. Specific Gravity

If you have any questions regarding this matter, please feel free to contact me or Tim Iannuzzi at 410.295.1205

Sincerely,

BLASLAND, BOUCK & LEE, INC.

Tim Donegan
Senior Project Engineer

cc: Tim Iannuzzi, Vice President

Attachment C

Schedule of MBE Participation

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Attachment C

MARYLAND ENVIRONMENTAL SERVICE
STATE OF MARYLAND

SCHEDULE OF MBE PARTICIPATION

Project ID Number 03-07-22 Total Contract Amount $[redacted]

PROJECT DESCRIPTION: Feasibility-Level Environmental Conditions Study for a Potential Island Restoration Project at Barren Island, Dorchester County, MD

PRIME CONTRACTOR: Blasland, Bouck & Lee, Inc.

Contact Person: Timothy J. Iannuzzi Phone: 410-295-1205

Address: 326 First Street, Suite 200 Fax: 410-295-1225

Annapolis, MD 21403-2678 MBE Certification No.: _____

Prime Contractor's Minority Status (MBE Classification if applicable)

X N/A
___ African American ___ Female ___ Alaskan Native ___ Hispanic American
___ Asian American ___ Native American ___ Disabled ___ Non-Profit

OVERALL MBE DOLLAR AMOUNT ACHIEVED $[redacted]

OVERALL MBE PERCENTAGE 18.5 %

SUB-GOALS ACHIEVED:

WOMEN-OWNED TOTAL DOLLAR AMOUNT $[redacted]

WOMEN-OWNED PERCENTAGE 17.8 %

AFRICAN-AMERICAN TOTAL DOLLAR AMOUNT $ 0

AFRICAN-AMERICAN PERCENTAGE 0 %

Document Prepared By: (please print or type)

Printed Name: H. Larry Vozzo Title: Senior Vice President/ General Counsel

Signature: [signature] Date: February 5, 2003

Approved By: (leave blank; to be completed by MES' MBE Liaison Officer)

Signature: _____ *Date:* _____

Revised 11/6/01

List Information for Each MBE Subcontractor on This Project

For multiple vendors, please make additional copies of this form

A. Minority Firm Name: Air, Water & Soil Laboratories, Inc. Contact Person: Carmela L. Tombes

Address: 2109A North Hamilton Street Phone: 804-358-8295

Richmond, VA 23230 Fax: 804-358-8297

MDOT MBE Certification Number: 01-549

Minority Status (MBE Classification)

___ African American X Female ___ Alaskan Native ___ Hispanic American

___ Asian American ___ Native American ___ Disabled ___ Non-Profit

Tasks: Water Quality/Sediment Laboratory Analyses

Project Commitment Date: 2/07/03 Project Completion Date: 10/31/03

Percentage of Total Contract: 17.8 % Agreed Dollar Amount: $[redacted]

B. Minority Firm Name: E2CR, Inc. Contact Person: Siva Balu

Address: 9004 Yellow Brick Road, Suite E Phone: 410-574-4393

Baltimore, MD 21237 Fax: 410-574-7970

MDOT MBE Certification Number: 98-293

Minority Status (MBE Classification)

___ African American ___ Female ___ Alaskan Native ___ Hispanic American

X Asian American ___ Native American ___ Disabled ___ Non-Profit

Tasks: Geotechnical Engineering

Project Commitment Date: 2/07/03 Project Completion Date: 10/31/03

Percentage of Total Contract 0.7 % Agreed Dollar Amount: $[redacted]

C. Minority Firm Name: _____ Contact Person: _____

Address: _____ Phone: _____

_____ Fax: _____

MDOT MBE Certification Number: _____

Minority Status (MBE Classification)

___ African American ___ Female ___ Alaskan Native ___ Hispanic American

___ Asian American ___ Native American ___ Disabled ___ Non-Profit

Tasks: _____

Project Commitment Date: _____ Project Completion Date: _____

Percentage of Total Contract _____ % Agreed Dollar Amount: $_____

Attachment D

Subcontractor Project Participation Statement

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Attachment D.

MARYLAND ENVIRONMENTAL SERVICE
STATE OF MARYLAND

SUBCONTRACTOR PROJECT PARTICIPATION STATEMENT

SUBMIT ONE FORM FOR EACH CERTIFIED MBE LISTED IN THE MBE SCHEDULE OF PARTICIPATION

Provided that Blasland, Bouck & Lee, Inc. is awarded the State
(Prime Contractor Name)

contract in conjunction with Project ID No. 03-07-22, it and Air, Water & Soil Laboratories, Inc.
(Subcontractor Name)

MDOT Certification No. 01-549, intend to enter into a contract by which Subcontractor shall

Provide water and sediment laboratory analytical services.

(Description of Work)

☒ No bonds are required of Subcontractor

☐ The following amount and type of bonds are required of Subcontractor:

H. Larry Vozzo
Prime Contractor Signature

Air Water & Soil Labs, Inc
Subcontractor Signature

By: H. Larry Vozzo, Senior Vice President/ General Counsel
Name, Title

By: Carmela L. Jones
Name, Title

February 5, 2003
Date

1-31-03
Date

Revised 11/6/01

Attachment D.

MARYLAND ENVIRONMENTAL SERVICE
STATE OF MARYLAND

SUBCONTRACTOR PROJECT PARTICIPATION STATEMENT

SUBMIT ONE FORM FOR EACH CERTIFIED MBE LISTED IN THE MBE SCHEDULE OF PARTICIPATION

Provided that Blasland, Bouck & Lee, Inc. is awarded the State
(Prime Contractor Name)

contract in conjunction with Project ID No. 03-07-22, it and E2CR, Inc.,
(Subcontractor Name)

MDOT Certification No. 98-293, intend to enter into a contract by which Subcontractor shall

Provide geotechnical analyses of sediment samples.

(Description of Work)

☒ No bonds are required of Subcontractor

☐ The following amount and type of bonds are required of Subcontractor:

H. Larry Vozzo
Prime Contractor Signature

Subcontractor Signature

By: H. Larry Vozzo, Senior Vice President/ General Counsel
Name, Title

By: SIVA BALU, CEO
Name, Title

February 5, 2003
Date

1-31-03
Date

Revised 11/6/01

Appendix A

Environmental Field Sampling Plan

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REPORT

Field Sampling Plan for Existing Environmental Conditions at Barren Island

Winter & Spring 2003

Maryland Environmental Service
2011 Commerce Park Drive
Annapolis, MD 21401

February 2003

BBL®
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engineers & scientists

Table of Contents

1. Introduction

1.1 Purpose of Study

This field sampling plan (FSP) was prepared by Blasland, Bouck & Lee, Inc. (BBL) based on the *Sampling Plan Template for Existing Environmental Conditions on a Mid Bay Island* (*Template*) prepared by Maryland Environmental Service (MES, 2003) and provided to BBL in the Request for Proposal (RFP) for Feasibility-Level Environmental Conditions Studies for a Potential Island Restoration Project at Barren Island, Dorchester County, Maryland. Portions of the *Template* document are incorporated into this FSP verbatim because the scope of these studies have been defined by MES, and the field sampling and analytical methods have been previously prescribed and implemented. These methods generally follow the sampling and analysis guidelines used by the U.S. Environmental Protection Agency's (USEPA's) Chesapeake Bay Program (CBP) and the Maryland Department of the Environment (MDE). To that end, BBL recognizes the importance of utilizing, to the extent possible, the same or similar field methodologies and sampling approaches as previous MES sampling programs for Barren Island in order to produce comparable datasets. The data collected under the Winter and Spring 2003 sampling programs (i.e., this FSP) will be combined with the previous datasets to develop a comprehensive environmental conditions report for the proposed Barren Island restoration project.

The purpose of this environmental sampling effort at Barren Island is to document the existing ecological resources that exist on the remnants of Barren Island and in the area of the Chesapeake Bay surrounding the Island. Two sampling events are planned under this FSP: Winter 2003 and Spring 2003. These events represent the third and fourth seasons of four seasonal sampling events. The first two seasonal sampling events were conducted in Summer 2002 and Fall 2002. These data are being collected to support a planned feasibility study to evaluate Barren Island (Dorchester County, Maryland) as a potential habitat restoration project. The proposed restoration project would beneficially utilize dredged material from the Port of Baltimore and elsewhere in the Chesapeake Bay to construct, stabilize, and restore wetland and upland habitats on Barren Island.

The following studies are included in this FSP:

- Water quality analyses
- Sediment quality analyses
- Plankton (zooplankton and ichthyoplankton) surveys
- Benthic invertebrate community surveys and associated sediment geotechnical analyses
- Fisheries surveys (using trawl, seine, and gill net techniques)
- Vegetation surveys (terrestrial, wetland, and aquatic habitats), including submerged aquatic vegetation (SAV) mapping
- Avian and wildlife surveys
- Documentation of other environmental and cultural resources

BBL will implement these studies per the specifications described in the following sections of this FSP. We anticipate that the two seasonal sampling events (Winter and Spring 2003, respectively) will occur during a period of about three weeks each.

It is anticipated that this draft of the FSP may be modified by BBL in response to additional data or information provided by MES following initiation of the project. In particular, BBL anticipates reviewing the methods and results of previous seasonal investigations that were conducted for the proposed Barren Island restoration project

prior to finalization of the FSP for this program. This will allow us to ensure that the methods and analyses that are planned under this FSP will produce the types and quality of data that have been produced in the previous seasonal sampling events and that the overall project database will be comparable. In addition, this review of the previous sampling results will allow BBL to advise MES on any additional data or information that may be necessary to complete a feasibility study for the proposed project but that have not been collected to date.

1.2 Study Area Description

Barren Island is located in Dorchester County (Maryland) immediately west of Hoopers Island across from the mouth of the Patuxent River in the Chesapeake Bay (see Figure 1-1). Historic and current mapping of the island indicated that the island has lost approximately 78% of its acreage since 1848. Currently, Barren Island consists of three island remnants that total approximately 180 acres. Barren Island is currently federally owned and managed by the U.S. Fish and Wildlife Service as a satellite refuge area to Blackwater National Wildlife Refuge.

Barren Island is being considered for an island restoration project to be restored to a 50/50 upland to wetland ratio by acreage using suitable dredged material to restore the island. Two potential dike alignments (footprints) are being considered at this phase of study (Figure 1-2). The alignments range in size from 1000 to 2000 acres and lie west-southwest of the remnants of Barren Island.

The environmental conditions sampling in this FSP will be conducted within and adjacent to the footprints of the proposed project and on and adjacent to the three island remnants. Details regarding sampling locations are provided for each of the specific field studies in the following sections.

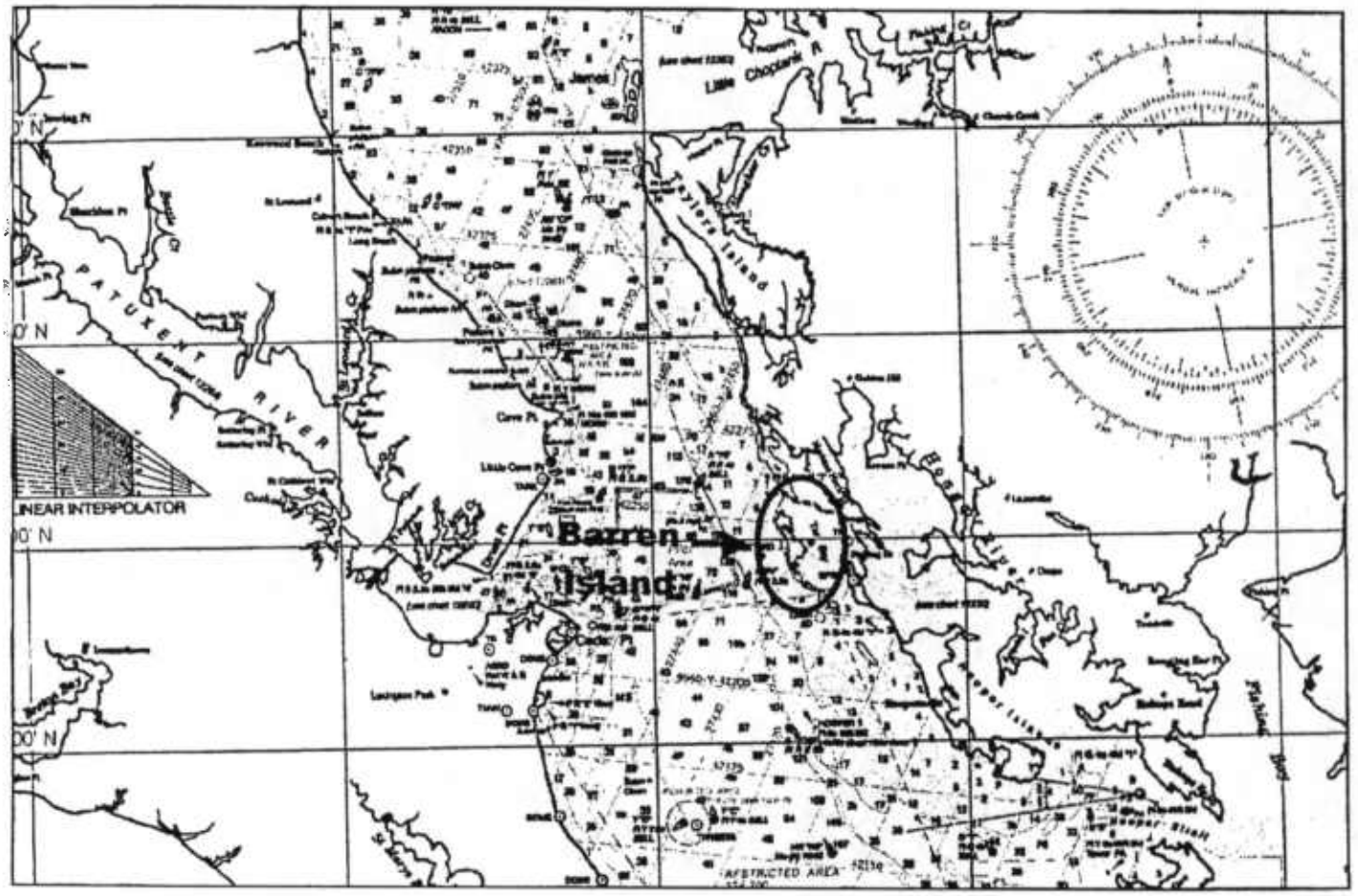

Figure 1-1. Site Map

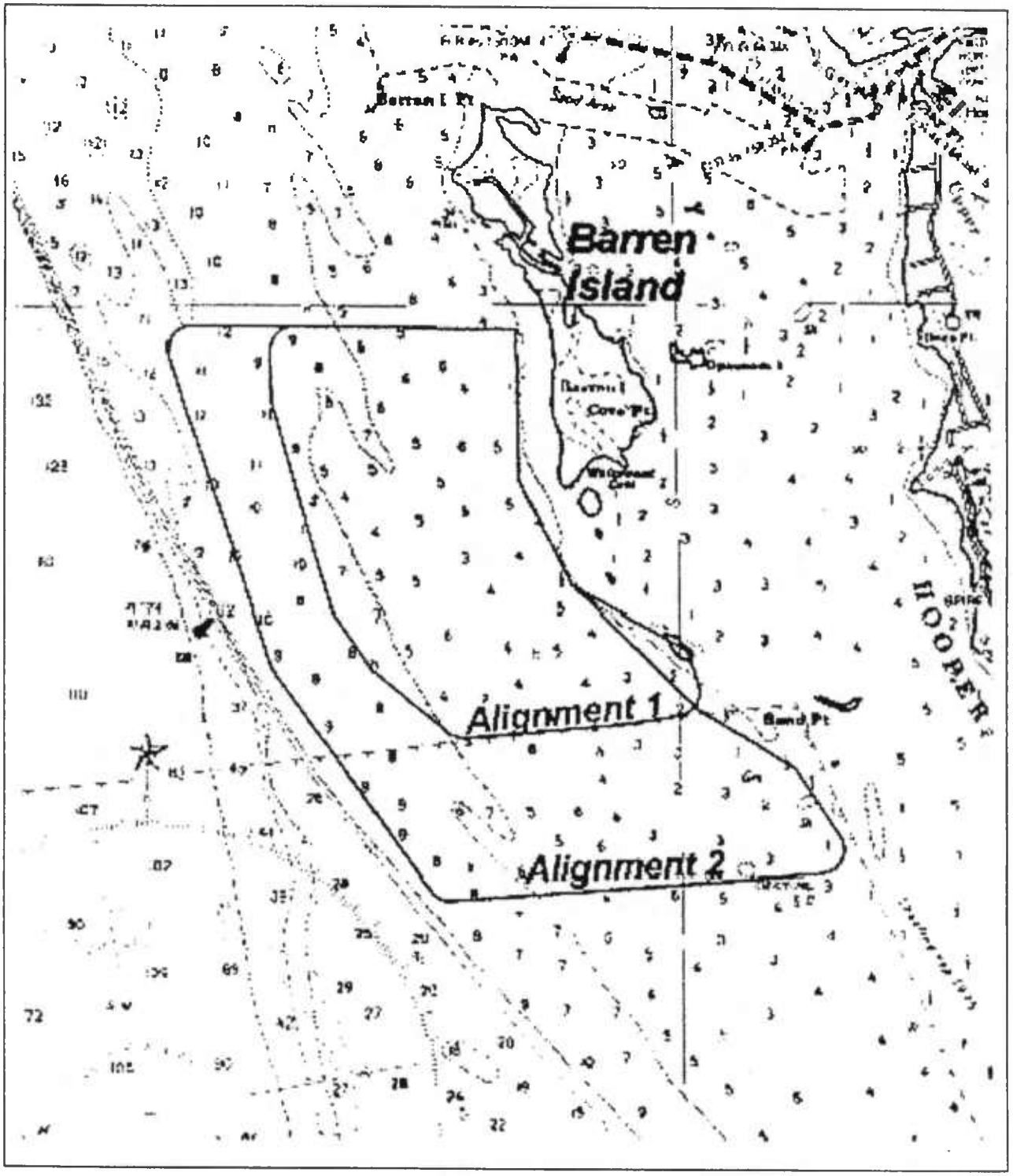

Figure 1-2. Potential Dike Alignments (Footprints)

2. Sampling and Analysis Plan

The following sections document the field sampling and analysis methods that will be used to implement the studies to be conducted under this FSP. Mobilization and demobilization, as well as each sampling activity, will be coordinated through BBL's Annapolis, Maryland office.

Quality assurance and quality control QA/QC procedures for this FSP will be detailed in the Quality Assurance Project Plan (QAPP) that will be developed during the finalization of this FSP following project initiation. A Health and Safety Plan (HASP) will also be developed as part of the final FSP.

All field observations and data collection efforts will be documented by BBL field personnel on project data sheets (task-specific) and waterproof field log books. Differential Global Positioning System (DGPS) will be used to obtain positions of sample locations and to generate coordinates for specific observations as appropriate.

2.1 Water Quality Analyses

The objective of the water quality analyses is to document *in situ* physicochemical characteristics of the water column surrounding Barren Island each season and to collect and analyze water samples for standard nutrient and chemistry parameters. These data will be used (in conjunction with previous seasonal water quality data collected by MES and others) to establish baseline seasonal water quality conditions in the area of the Chesapeake Bay surrounding Barren Island.

2.1.1 Field Sampling Methods

Water quality samples will be collected during both the Winter and Spring 2003 sampling events at each of the 10 locations depicted on Figure 2-1. Water will be pumped from a point at approximately mid-depth within the water column using a peristaltic pump and Tygon tubing. At each station, two 1-liter (whole water) samples and two 125-milliliter (mL) filtered water samples will be collected[1]. Filtered water samples will be filtered in the field using a gravity filtration system and micro-pore filters.

The whole water and filtered water samples will be labeled with the sample location plus date and time of sampling, and then immediately stored on ice. DGPS coordinates and *in situ* physicochemical parameters will also be recorded at each site. These parameters include:

- Secchi disc depth
- Temperature
- Dissolved oxygen
- Salinity
- pH
- Turbidity

This set of *in situ* parameters will also be recorded during subsequent field sampling tasks, as specified in the following sections of this FSP.

[1] These volumes are a minimum sample volume that will be collected for filtered and unfiltered samples. Additional volumes of water may be collected if requested by the water quality laboratory.

All water quality sampling will be conducted on the same day, and iced samples will be delivered to the water quality laboratory that afternoon/evening. Samples will be recorded on standard chain-of-custody forms, which will be signed and delivered with the samples.

2.1.2 Laboratory Methods

At the laboratory, water samples will be analyzed using methods prescribed in *Recommended Guidelines for Sampling and Analysis in the Chesapeake Bay Monitoring Program* (USEPA 1996). These methods have been standardized for the Chesapeake Bay so the results will be comparable to other Bay sampling programs. The following analyses will be conducted on each set of samples:

- Total dissolved nitrogen
- Particulate nitrogen
- Nitrite
- Nitrate + Nitrite
- Ammonium
- Organic nitrogen
- Total dissolved phosphorus
- Orthophosphate (SRP)
- Total N and Total P
- Particulate carbon
- Dissolved organic carbon
- Cholorphyll a and Phaeophytin a
- Total suspended solids

2.2 Sediment Quality Assessment

The objective of the sediment quality assessment is to document physicochemical characteristics of the surficial sediments surrounding Barren Island. These data will be used (in conjunction with previous sediment quality data collected by MES and others) to evaluate the sediment quality of the area surrounding Barren Island.

2.2.1 Field Sampling Methods

This sediment quality assessment will be conducted in conjunction with the benthic invertebrate community surveys (see Section 2.4). In the Spring, sediment grab samples will be collected at 5 of the 10 benthic sampling locations depicted on Figure 2-1. The exact locations for sampling will be selected in consultation with MES following a field reconnaissance. Stations will be selected based on Summer 2002 sediment sampling locations and positions relative to the island and proposed alignments. The boat will be anchored at each station, and the coordinates of the site will be determined and recorded using a DGPS. At each station, mid-depth *in situ* water quality measurements will be recorded (as specified in Section 2.1).

In order to obtain a bulk sediment quality sample of sufficient volume for the various chemical analyses that are required (at each location), multiple surface grab samples will be collected using a 9-in. x 9-in. Ponar sampler, deposited into a single sample container, and homogenized. The homogenized sediment sample will then be allocated to appropriate sample containers provided by the sediment analytical laboratory. All sediment quality

sampling will be conducted on the same day, and iced samples will be shipped to the laboratory that afternoon/evening. Samples will be recorded on standard chain-of-custody forms, which will be signed and delivered with the samples.

2.2.2 Laboratory Methods

The sediment analytical laboratory will provide BBL field personnel with appropriate sample containers and associated blank and duplicate sample containers. Required sample volumes for each sampling site will be based upon the requirements of material for the following list of analyses that will be conducted on each set of samples. Based on the general list of analyses specified within the RFP, BBL made certain assumptions regarding specific analytical methodologies that will be used. In particular, the necessity for laboratory analysis for a full suite of 209 polychlorinated biphenyl (PCB) congeners and 23 Target Analyte List (TAL) metals were not specified by MES in the RFP. If MES determines that a lesser amount of PCB and metal analyses are required, associated laboratory costs would decrease accordingly.

Sediment Laboratory Analyses	Laboratory Method
Semivolatile organic compounds	USEPA Method 8270
Chlorinated pesticides	USEPA Method 8081
Organophosphorus pesticides	USEPA Method 8141
Polychlorinated biphenyls (PCBs), 209 congeners	USEPA Method 1668
Polycyclic aromatic hydrocarbons (PAHs)	USEPA Method 8100
Metals, 23 Target Analyte List (TAL)	USEPA Method 6010B / 7470
Dioxin and furans	USEPA Method 1613
Butyltins	NOAA 1993 Method
Ammonia (NH3-N)	USEPA Method 350.3
Nitrate/nitrite	USEPA Method 353.3
Cyanide in sediment	SW-846 Method 9010
Total sulfide	SW-846 Method 9030
Total Kjeldahl nitrogen (TKN)	USEPA Method 351
Acid volatile sulfide (AVS) in sediment	AVS
Simultaneously extracted metals (SEM) in sediment	SEM
Total organic carbon (TOC)	Standard Method 5310C
Total phosphorus	Standard Method 4500-PB5
Biochemical oxygen demand (BOD)	Standard Method 5210B
Chemical oxygen demand (COD)	Standard Method 410.4

BBL will work closely with the analytical laboratory to ensure that sampling and analytical protocols meet all quality assurance requirements. These will be clearly specified in the QAPP.

2.3 Plankton Surveys

The objective of the plankton sampling is to document existing communities of zooplankton and ichthyoplankton in the water column of the Chesapeake Bay surrounding Barren Island. These data will be used (in conjunction with the results of previous seasonal plankton surveys collected by MES and others) to establish baseline seasonal water quality conditions in the area of the Chesapeake Bay surrounding Barren Island. The Winter 2003 and Spring 2003 sampling program will include both zooplankton and ichthyoplankton surveys.

2.3.1 Field Sampling Methods

Plankton sampling will be conducted in the Winter and Spring of 2003 at six locations, as depicted on Figure 2-2. These are the same sampling locations that will be used for the fisheries trawl surveys.

Two separate 5-minute tows—one each at the surface and bottom—will be conducted. For each tow, a constant boat speed of 1100 rpm will be maintained. Two 2.5-meter (m) long conical plankton nets with 0.5-m mouth openings made from 0.5-millimeter (mm) mesh will be used for each tow. These will be mounted side-by-side on a rigid metal towing frame and sled, and 1-liter plastic collection jars will be used as cod ends. A digital flow meter will be fixed in the mouth of each net to record sample volume. A third flow meter will be attached to the sled frame outside one of the nets to monitor net clogging. If substantially lower (> 10 % difference) flow meter readings are found in-net as compared to outside, the tow will be repeated. Before deploying the plankton sled, flow meter readings will be recorded from each of the three meters, and DGPS beginning positions will be recorded. The standard towing period will be 5 minutes, and the tows will run parallel to the prevailing currents.

The amount of line deployed will be calculated from a nomograph using the water depth and a cable angle. At the end of each tow, the final flow meter and DGPS readings will be recorded in the field log book. The contents of each net will be rinsed down, concentrating the catch into the cod end jar. Sample jars will be removed from the nets, labeled (inside and out), and preserved with 70% (or greater) isopropyl alcohol. Samples will be recorded on standard chain-of-custody forms, which will be signed and delivered with the samples. At each station, mid-depth *in situ* water quality measurements will be recorded (as specified in Section 2.1).

2.3.2 Laboratory Methods

In the laboratory, plankton samples will be rinsed using a 0.4-mm sieve to remove excess preservative. Detritus and debris will be removed prior to sorting. Larger organisms will be removed and recorded. Samples will be sorted completely, and all fish eggs, larvae, and juveniles encountered will be segregated for identification and enumeration. Ichthyoplankton will be identified to the lowest practical taxon and enumerated. Macrozooplankton will also be removed and enumerated by class. All observations will be noted on standard laboratory sorting sheets. The remaining samples will be re-condensed and re-preserved for storage.

Plankton will be reported as densities per 100 m^2. This will be accomplished by converting the net (final minus initial) flow meter reading to the distance and volume readings (based upon the net-mouth opening), and then extrapolating to the number of organisms per 100 m^2.

2.4 Benthic Invertebrate Community Surveys

The objective of the benthic invertebrate surveys is to document existing communities of infaunal macroinvertebrates in sediments from the Chesapeake Bay surrounding Barren Island and to document the geotechnical characteristics of the sediments in which these communities exist. These data will be used (in conjunction with the results of previous seasonal benthic invertebrate community surveys collected by MES and others) to establish baseline benthic invertebrate community conditions in the area of the Chesapeake Bay surrounding Barren Island.

The benthic invertebrate data will be subjected to substantial standardized data analyses relative to the structure and composition of the community. This will include computation of a number of indices of diversity, abundance, dominance, evenness, and pollution tolerance. These analyses will allow the site data regarding the structure and composition of the benthic community surrounding Barren Island to be compared with similar data from other areas in the Chesapeake Bay. The culmination of these analyses will be the assessment of the condition of the benthic community surrounding Barren Island (relative to other areas in the Chesapeake Bay) using the Chesapeake Bay Benthic Index of Biotic Integrity (B-IBI) developed by Weisberg et al. (1997).

2.4.1 Field Sampling Methods

In the Spring, sediment grab samples will be collected for benthic invertebrate community analysis at 10 locations around Barren Island. The exact locations for sampling will be selected in consultation with MES following a field reconnaissance. Stations will be selected based on water depth and positions relative to the island and proposed alignments. The boat will be anchored at each station, and the coordinates of the site will be determined and recorded using a DGPS.

Triplicate grab samples will be collected at each sampling location using a standard 9-in. x 9-in. Ponar grab sampler. After the sample is pulled aboard, the extent of the sample in the grab will be visually estimated (e.g., one quarter full, half-full, three-quarters full, etc.) and recorded in the field logbook. This may be important information in the event that large discrepancies are found during data analysis (e.g., in biomass or abundance estimates), and the sample "volume" will need to be consulted. An attempt will be made to achieve a "full" sample in the Ponar grab for each location.

Once a sample is collected, any large debris will be removed, and the sediment will be sieved in the field through a 0.5-mm (U.S. Standard #35) screen to remove fine sediment particles. Individual replicates will be transferred to labeled bottles and preserved in the field using 70% (or greater) isopropyl alcohol. *In situ* water quality measurements will be measured at all benthic stations (as specified in Section 2.1).

Sediment Sampling for Geotechnical Characteristics

One additional grab sample will be collected at each benthic sampling location for analysis of geotechnical characteristics. These will include:

- Total organic carbon (TOC)
- Grain size
- Percent fines
- Atterberg limits
- Specific gravity

The TOC samples will be stored in certified clean containers and refrigerated at 4°C during storage. The samples for grain size and the remaining parameters will be stored in sealable plastic bags. All geotechnical analyses will be conducted according to American Society for Testing and Materials (ASTM) standard methods.

Sample Storage and Transport

Benthic samples collected during each day will be preserved in the field and stored in appropriate containers out of direct sunlight on the workboat. After completion of benthic sampling, the samples will be sent to the laboratory for sorting, subsampling (if necessary), and taxonomic identification to the lowest practicable taxonomic level. Samples will be recorded on standard chain-of-custody forms, which will be signed and delivered with the samples.

2.4.2 Laboratory Methods

In the laboratory, each benthic infaunal sample will be washed with tap water through a 0.5-mm sieve to remove the preservative in preparation for lab processing. If there are a large number of organisms in the samples, the samples can be subsampled. The subsamples will be placed in a shallow white pan and the organisms will be separated from other sample material and placed into vials. The samples will be sorted by major taxonomic groups and identified to the lowest practicable taxonomic level.

2.5 Fisheries Surveys

The objective of the fisheries surveys is to document existing fish and blue crab communities from various habitats in the Chesapeake Bay surrounding Barren Island. These data will be used (in conjunction with the results of previous seasonal fisheries surveys collected by MES and others) to establish baseline information on the fish and crab communities in the area of the Chesapeake Bay surrounding Barren Island.

2.5.1 Field Sampling Methods

Three sampling techniques will be employed for the fisheries surveys:

- Beach seines
- Bottom trawls
- Gill nets

A fourth technique, pop net sampling, will also be performed in the Spring of 2003 by Andrews Miller & Associates, Inc. under a separate MES contract and FSP. The results of the pop net sampling will be combined with the results of the surveys being conducted under this FSP during the data analysis phase of this project.

The beach seine sampling will be used to collect data on nearshore fish assemblages. The bottom trawls will be used to collect data on the benthic or demersal fish assemblages. The gill nets will be used to collect data on fish throughout the water column that are present near Barren Island during each seasonal sampling event.

The proposed locations for the fisheries surveys are depicted (by gear type) on Figure 2-2. There will be four gill net sampling locations, five beach seine locations, and six trawling locations. Each have been located within

and adjacent to the proposed dike alignments. All fish and crabs that are captured will be returned to the water immediately following processing (as specified in the following subsections).

Beach Seine

Beach seining will be conducted at five locations as depicted on Figure 2-2 (locations S-1 through S-5). Locations were chosen to represent various types of shore-zone habitat as well as the eastern and western sides of the islands. Actual sampling locations will be determined and recorded using DGPS.

A 100-ft. x 4-ft. seine net with 1/4-inch mesh will be used to sample the seine locations. The net will be deployed in an arc, perpendicular to the shoreline, to sample approximately 30 meters of shoreline. Two consecutive and adjacent hauls will be made at each of stations for a combined shoreline distance of approximately 60 meters. All fish and blue crabs that are captured will be identified to the lowest practicable taxon, enumerated, and returned to the water. A representative subsample of up to 50 individuals per species from each haul will be measured to the nearest millimeter. Measurements will include total lengths of fish and carapace widths of blue crabs. Data will be recorded on standard data sheets. Organisms having external parasites, disease, or morphological abnormalities will be noted on the datasheet. Numbers of organisms collected during the two hauls at a single location will be summed. At each sampling location, mid-depth *in situ* water quality parameters will be collected (as specified in Section 2.1).

Bottom Trawl

Bottom trawling will be conducted at six locations, as depicted on Figure 2-2. Two otter trawl tows will be made at each station 3 hours before and 3 hours after the high tide and spaced several hundred feet apart. The gear employed will be a 16-foot semi-balloon otter trawl with a 3/4-in liner. When the net is deployed, DGPS coordinates will be recorded at the beginning and end of each tow. Two separate 5-minute tows will be conducted at each of the six locations at a constant boat speed of 1300 rpm. Longer tows are probably not possible due to obstructions, such as crab pots and downed trees. The two tows will be made parallel to the prevailing currents, tidal flow, or wind, whichever is greater. A 7:1 warp-to-tow ratio will be used at all times to ensure that the net is fishing on the bottom.

The contents of each trawl will be processed onboard the boat following retrieval. Fish and crabs will be identified, enumerated, and returned to the water. Fifty individuals per species from each tow will be measured to the nearest millimeter. Measurements will include total lengths of fish and carapace widths of blue crabs. Data will be recorded on standard data sheets. Organisms having external parasites, disease, or morphological abnormalities will be noted on the datasheet. Organisms collected during the two tows at a single location will be summed to represent 10-minutes of total effort. At each sampling location, mid-depth *in situ* water quality parameters will be collected (as specified in Section 2.1).

Gillnets

Gillnetting will be conducted at four locations, as depicted on Figure 2-2 (locations G-1 through G-4). 100-ft experimental gillnets with five panels of different mesh size will be utilized. The mesh varies from 3/4-in to 2.5-in (square mesh) and will target a wide variety of species and life stages that would typically utilize the shallow water habitats around Barren Island. One net per station will be deployed as fixed gear, overnight, for at least 12 hours. Nets will be set perpendicular to the prevailing tidal current with the smallest mesh in the shallower (near shore) waters. DGPS coordinates will be recorded at the centerpoint of each net set.

All organisms captured in the nets will be processed onboard the boat. Organisms will be identified, enumerated, and returned to the water. A representative subsample of 50 individuals per species at each station

will be measured to the nearest millimeter. The measurements will include total lengths of finfish and carapace widths of blue crabs. Data will be recorded on standard fisheries data sheets. Organisms having external parasites, disease, or morphological abnormalities will be noted on the datasheet. At each sampling location, mid-depth *in situ* water quality parameters will be collected (as specified in Section 2.1).

2.6 Terrestrial and Wetland Vegetation Surveys

Vegetative communities and habitat observations will be made on all of the Barren Island remnants. Two scientists will walk the remnant islands and note any seasonal differences from previous efforts. Plant species will be noted on standard data sheets. The intent of the vegetation surveys is to identify the distribution and composition of plant communities present, such as low marsh, high marsh, upland, open water, and submerged aquatic vegetation (SAV) habitats.

The plant species compositions of these areas will be determined in terms of dominant and sub-dominant plants (by visual dominance estimation) determined to the genus and species, where possible. Observations will be documented by digital photography and videotape. Field maps, with estimated acreages, will be prepared delineating wetlands, uplands, open water, beach, and submerged aquatic vegetation (SAV) beds in the vicinity of the project area. Additional breakdowns of these categories by vegetation communities will be made as possible.

In order to support potential restoration plan development, BBL scientists will establish multi-habitat transects to document the gradation of vegetation communities between habitat types on and adjacent to the island remnants. As part of this exercise, elevation change estimates and other physical observations will be recorded, along with the habitat and plant community changes.

2.7 Submerged Aquatic Vegetation Mapping

Occurrence of SAV in the vicinity of Barren Island will be mapped as part of the habitat surveys. A temporary buoy will mark the beginning of each of six 200-yard transects with five sampling points approximately 50 yards apart. Spacing should be measured from the buoy using a laser rangefinder. DGPS coordinates will be used to mark each sampling site to ensure that samples are collected at the same location.

Once anchored at the first sampling location, *in situ* water quality will be measured as previously specified in Section 2.1. It is only necessary to record water quality at the first station on each transect and record water depth at the other four stations. A lawn thatching rake with a round wire mesh basket (used for recreational crab-trapping) and 10 meters of line will be thrown for 5 minutes from three positions on the boat: bow, stern, and amidships. This sampling will average eight or more throws for each position to be consistent with previous sampling efforts. SAV gathered from each rake throw will be recorded according to the VIMS scale used to rate bed density.

2.8 Avian and Wildlife Observations

Timed bird survey observations will be made at five stations around the perimeter of the island remnants, as depicted on Figure 2-3. The proposed locations have been previously selected to represent the range of habitat types available around the island (i.e., forests, wetlands, open water, SAV, beach).

BBL will conduct these surveys at or near low tide and at or near high tide, and at both mid-day and dusk. At each location and time, the survey will be conducted covering a 180-degree observation area. Each survey will be 15 minutes in length. All birds heard and/or observed with binoculars during the 15-minute period will be recorded on data sheets by species. For flocks of gulls, an estimate of the number will be made and the species types noted.

The data will be recorded on bird data sheets. These will consist of the following four sections:

- Sample information (date, time, location, weather conditions)
- Habitat checklist
- Bird species checklist
- Miscellaneous notations

Bird species considered relatively common over a wide diversity of habitat types and seasons are listed in the checklist. Bird species are listed in taxonomic order and broken into categories as follows:

- Loons-Herons-Pelicans
- Geese-Ducks
- Vultures-Hawks
- Game Birds
- Shorebirds
- Bulls
- Doves-Cuckoos
- Owls
- Nightjars-Swifts
- Hummingbirds
- Kingfishers
- Woodpeckers
- Flycatchers
- Shrikes
- Vireos
- Jays-Crows
- Larks
- Swallows
- Titmice-Chickadees
- Creepers-Nuthatches
- Wrens
- Kinglets-Gnatcatchers
- Thrushes
- Mimids
- Starlings-Waxwings
- Warblers
- Tanagers
- Towhees-Sparrows
- Cardinals-Grosbeaks
- Icterids
- Finches
- Old Word Sparrow

In addition to the timed avian observations, any incidental bird species observed during the vegetation (habitat) survey will be noted. Evidence of any former nesting activity will be mapped as well. Wildlife species and signs (e.g., tracks, scat, bones, etc.) observed during vegetation surveys will also be recorded. When possible, the total number of individual wildlife species will be noted in the field log book.

2.9 Other Resources

Observations of historical, archeological, and other environmental resources encountered during fieldwork will be noted in the field log book and mapped. This also applies to observations related to essential fish habitat, natural oyster bars, shell beds, hazardous materials, aesthetics of the project, navigational areas, critical areas, and rare, threatened and endangered species. This effort will build upon observations from the previous surveys, as well as information obtained from historical reports, maps, and/or documents.

2.10 Sample Labeling and Identification

For the water quality, plankton, and benthic invertebrate sample collection programs, sample identifiers will be established before field sampling begins and assigned to each sample as it is collected. Sample identifiers

consist of codes designed to fulfill two purposes: 1) to identify related samples (i.e., replicates) to ensure proper data analysis and interpretation; and 2) to track individual sample containers to ensure that the laboratory receives all of the material associated with a single sample. To accomplish these purposes, each container is assigned a sample identifier, a sample number, and a tag number. These codes and their uses are described below:

- Sample (Station) Identifier. A system of sample identifiers will be established by BBL before samples are collected. The sample identifiers may contain codes that identify the type of sample, related field replicates, station locations, and other sample information and will conform to any database requirements, such as length and format. The sample identifiers are entered into the field logs and database for use during data interpretation.

- Sample Number. The sample number is an arbitrary number assigned to each sediment sample collected. Each field replicate of a given type will have a different sample number, and the sample numbers of related field replicates will not necessarily have any shared content. The sample number appears on the sample containers, the chain-of-custody forms, and the sample analysis request forms.

- Tag Number. A different sample tag number is attached to each sample container. If the amount of material (i.e., everything associated with a single sample number) is too large for a single container, each container will have the same sample number and a different sample tag. The sample tag number will appear on the chain-of-custody and sample analysis request forms. Tag numbers are used by laboratories only to confirm that they have received all of the containers that were filled and shipped. Data are reported by sample number.

The sample labeling system shown above will be adapted, to the extent practical, to historical sampling codes of the previous investigations for the Barren Island project. Alternatively, prior samples can be fitted to the sample labeling system shown above for purposes of continuity in the project database.

Following labeling, all samples will be stored in a cooler onboard the vessel (out of direct sunlight) prior to shipment to the contract laboratory.

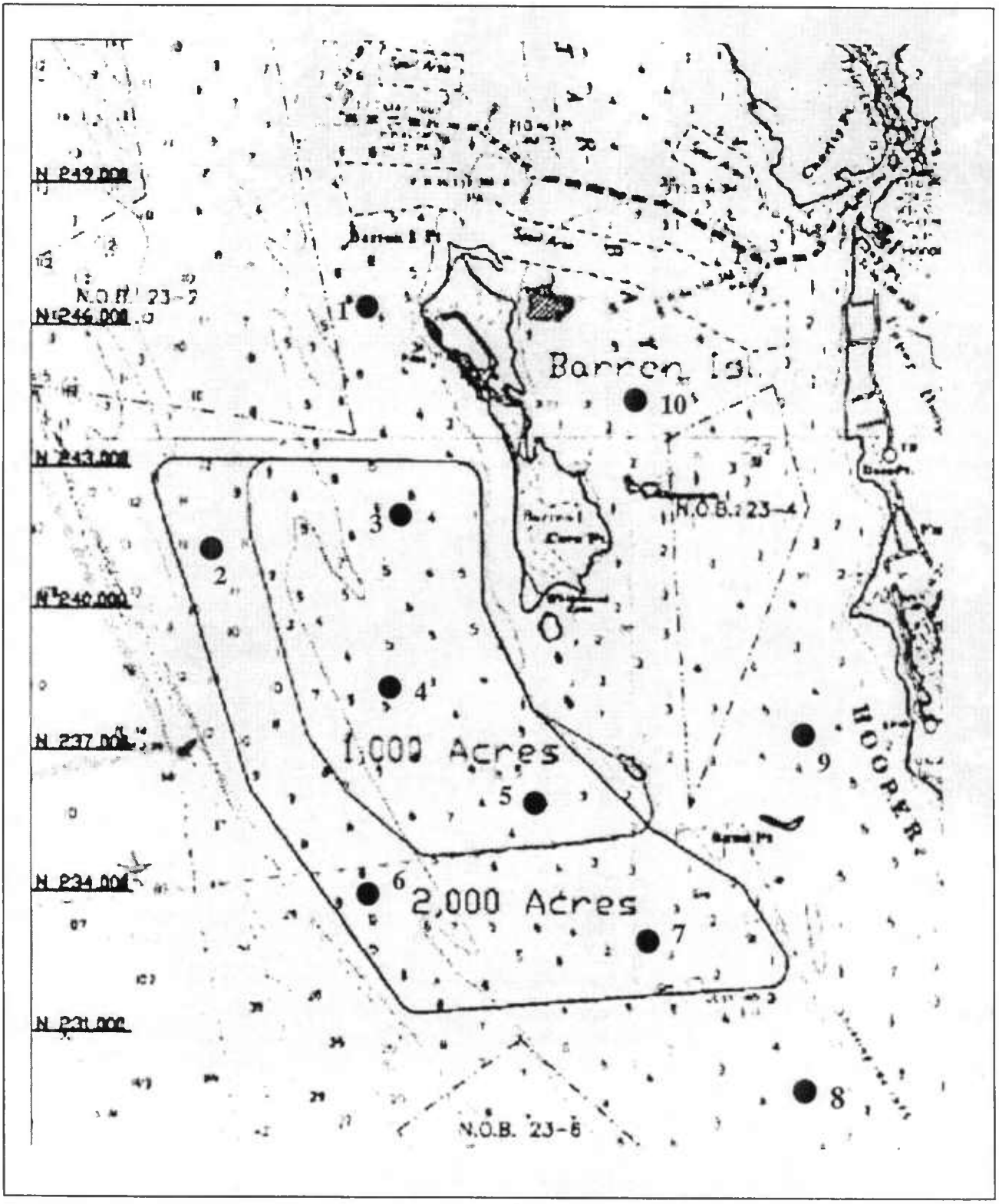

Figure 2-1. Water Quality and Benthic Sampling Locations

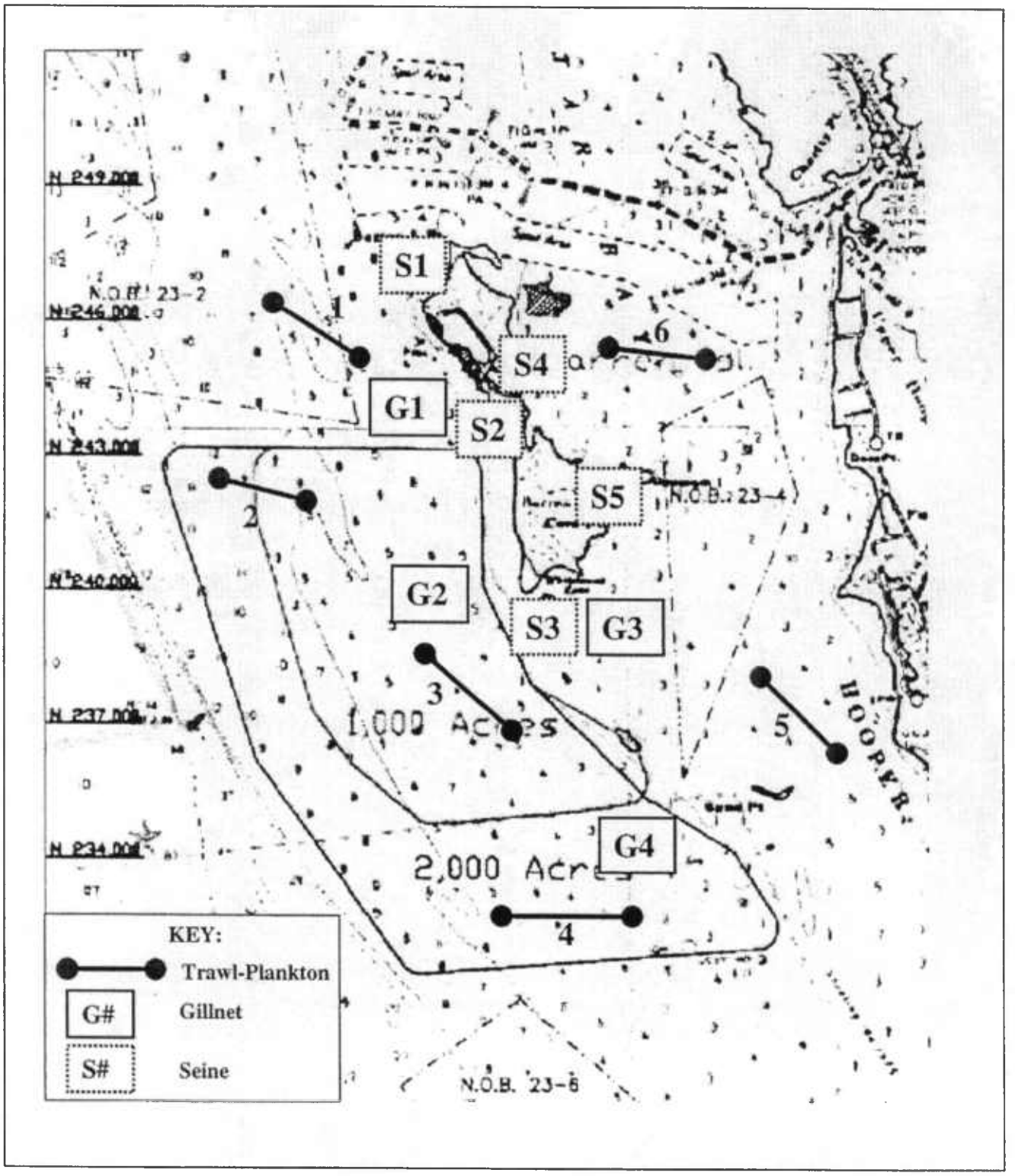

Figure 2-2. Seine, Gillnet, Trawl, and Plankton Collection Locations

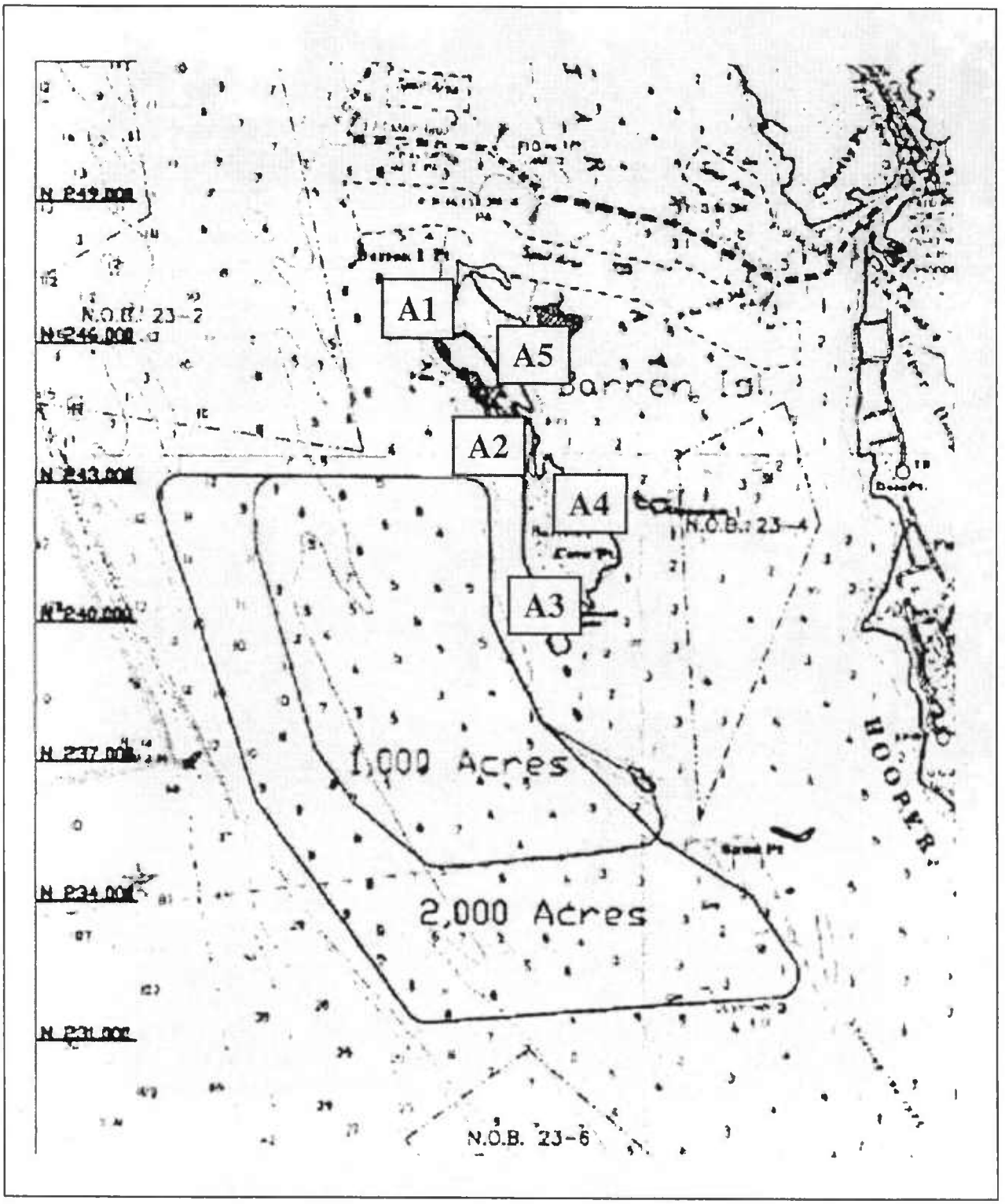

Figure 2-3. Avian Observation Locations

3. References

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