Floating Island International White Paper Response: BioBarrier™

Research Opportunity Number

Broad Agency Announcement (BAA) HSCG32-10-R-R00019

Amendment 0001

Agency

United States Coast Guard (USCG)

Research and Development Center (RDC)

1 Chelsea Street

New London, CT 06320

Research Opportunity Title

Deepwater Horizon Response

Program Name

Interagency Alternative Technology Assessment Program (IATAP)

Submitted: July 21, 2010

BAA Technology Gap Area Addressed:

Alternative Oil Spill Response Technologies:

Installations of BioBarrier Floating Treatment Wetland (FTW) as oil boom alternative.

Offeror:

Floating Island International (FII)

Bruce Kania
Floating Island International
10052 Floating Island Way
Shepherd, MT 59079
Phone: (406) 373-5200
email: bruce@floatingislandinternational.com

Supporting Licensees:

Floating Island Environmental Solutions (FIES)

Ted Martin
Floating Island Environmental Solutions
3185 Balis Drive Suite 113
Baton Rouge, LA 70808
Phone: (255) 923-2194
email: ted@floatingislandes.com

Headwaters Floating Island (HFI)

Tim Mulholland
Headwaters Floating Island
1018 2nd Avenue North
Billings, MT 59101
Phone: (406) 294-1019
email: tim.m@headwatersfi.com

Floating Island Southeast (FISE)

Ray Davis
Floating Island Southeast
P.O. Box 2405
Chapel Hill, N.C. 27515-2405
Phone: (888) 660-3473
email: rdavis@floatingislandse.com

Midwest Floating Island, LLC (MWFI)

Jeffrey Hanson
Midwest Floating Island, LLC
800 Hampden Ave.
St. Paul, MN 55114
Phone: (651) 645-5721 ext. 341
email: jeff@midwestfloatingisland.com

Floating Islands West, LLC (FIW)

Laddie Flock
Floating Islands – West, LLC
P.O. Box 1569
Lockeford, CA 95237
Phone: (209) 286-1445
email: laddieflock@yahoo.com

Supporting Product Suppliers and Technical Points of Contact:

Alden Research Laboratory Incorporated

Dave Schowalter
Alden Research Laboratory Incorporated
30 Shrewsbury St
Holden MA 01520-1843
Phone: (508) 829-6000 ext. 6476
email: dschowalter@aldenlab.com

Bro Tex Co. Inc.

Jeff Hanson
Bro Tex Co. Inc.
800 Hampden Avenue
Saint Paul, MN 55114-1299
Phone: (651) 645-5721 ext. 341
email: JHanson@brotex.com

AMERICO Manufacturing Company

Kris Panettiere
AMERICO Manufacturing Company, Inc.
6224 N. Main Street
Acworth, GA 30101
Phone: (770) 974-7000 ext. 221
email: KPANETTIERE@americomfg.com

Fiber Bond Corporation

Rick White
Fiber Bond Corporation
110 Menke Road
Michigan City, Indiana 46360
Phone: (219) 879-4541 ext. 307
email: rick.white@fiberbond.net

Apex Engineering

Mark Reinsel
Apex Engineering
19 Hummingbird Court
Helena, MT 59602
Phone: (406) 458-8933
email: reinsel39@msn.com

Kevin Distributing (Gaco Western)

Dan Bitney
Kevin Distributing
555 East Industrial Park Road
Shelby, MT. 59474
Phone: (877) 337-4001
email: danb@kevindistributing.com

BioDiversity Research Institute

David Evers
The Biodiversity Research Institute
19 Flaggy Meadow Road
Gorham, ME 04038
Phone: (270) 839-7600
email: david.evers@briloon.org

Louisiana State University

Dr. Ralph J. Portier
Louisiana State University
School of the Coast & Environment
1165 EC&E Bldg.
Baton Rouge, LA 70803
Phone: (225) 578-4287
email: rportie@lsu.edu

Sanderson Stewart

Rick Leuthold
Sanderson Stewart
1300 North Transtech Way
Billings, MT 59102
Phone: (406) 656-5255
email: rleuthold@sandersonstewart.com

Stewart Engineering

Frank Stewart
Stewart Engineering
3250 Prairie Smoke Road
Bozeman, MT 59715
Phone: (406) 586-0790
email: fstewart@hughes.net

The Absaroka Group

Jeffrey Griffin
The Absaroka Group
1645 Parkhill Dr.
Billings, MT 59102
Phone: (406) 256-1005
email: jfgrif@msn.com

Kenan C. Pomeroy
The Absaroka Group
1645 Parkhill Dr.
Billings, MT 59102
Phone: (406) 256-1005
email: KCPomeroy@live.com

U.S. Mooring Systems, Inc.

Michael Rawlings
U.S. Mooring Systems, Inc.
5842 Mcfadden Ave., Unit M
Huntington Beach, CA 92649
Phone: (714) 894-3300
email: Michael@usmooringsystems.com

SECTION A: Technical Approach:

1. Intended solution: Containment and bioremediation treatment of surface oil using the BioBarrier Floating Treatment Wetland (FTW) systems.

2. Introduction: Comprised of tested and commercially proven components, the BioBarrier FTW is originally designed as an improved oil containment boom device. Strategically configured, the BioBarrier FTW has the unique ability to not only contain surface oil but also begin to treat it through bioremediation.

3. Underlying Technology: The underlying technology of the BioBarrier FTW is comprised of two main elements: a) Floating Treatment Wetland matrix providing concentrated surface area; b) oil remediating microbial biofilm (Environmental Protection Agency (EPA) National Contingency Plan (NCP) (for Oil Spill Response) Product Schedule-listed bioremediation agent for oil, #B-54 – formerly known as "Pristine Sea II").

4. a) *The Floating Treatment Wetland matrix* is comprised of modular non-woven recycled polymer fiber sections that can be constructed to any size, in any shape, and engineered to achieve any positive, neutral, or negative buoyancy. The non-woven matrix and the engineering design of the FTW is the result of extensive publicly and privately funded research and development over the past 12 years. The feasibility of the technology has been proven, with over 3,500 FTWs launched worldwide. The largest FTW launched thus far is 39,700 ft^2 and was installed by order of the U.S. Army Corps of Engineers in Sheepy Lake, CA. Each cubic foot of matrix provides over 375 square feet of surface area for enhanced microbial colonization.

5. *b) Oil remediating microbial biofilm:* Surface area is a limiting variable relative to maximizing microbial processes that clean water. The BioBarrier FTW brings concentrated surface area to any water body. Millions of dollars of collaborative research has been conducted

by the Floating Island family of licensees together with some of the world's leading biofilm research organizations including Montana State University's Center for Biofilm Engineering. The BioBarrier FTW, designed using this advanced technical understanding of microbial biofilm engineering, is inoculated with a NCP-listed bioremediation microbial agent for oil (#B-54). These bioremediating microbes were developed by researchers at Louisiana State University, approved in tests by EPA's Risk Reduction Engineering Laboratory (RREL) and are licensed to TMD Technologies Group, LLC/Advanced BioSystems, LLC of Lafayette, LA.

6. The EPA Technical Product Bulletin #B-54, originally listed by the EPA's Oil Program Center on June 28, 1999, states that the EPA's RREL determined NCP-listed bioremediation microbial agent for oil (#B-54) to be effective in the degradation of petrochemical wastes. Tests conducted by the EPA's RREL resulted in bioremediation contaminant reduction percentages of 93.6% and 86.0% after only 11 days for contact volumes of alkane and aromatic contaminant constituents respectively.

7. How it will work: When addressing the mitigation of contaminated surface plumes, the likely objective would be containment of globules, on-site treatment, and/or recovery. In this application the BioBarrier FTW platform, pre-inoculated with bioremediation microbes, would be strategically positioned much like a traditional oil boom so as to maintain adequate prolonged contact with contaminated seawater while providing containment. The expandable and flexible floating design of the BioBarrier FTW also allows for the integration of mechanical oil separators and/or absorbent materials when required for recovery towards extraction and transportation off-site to allow for advanced treatment.

8. One of the premier features of the BioBarrier FTW is that its flexible modular design enables supplementary modules or sections to be added to existing stretches of BioBarrier FTWs,

thus providing a multiplier effect. Other benefits of BioBarrier FTWs include, but are not limited to, scalability, maneuverability, and availability. BioBarrier FTWs can be transported, towed, anchored, expanded, and repositioned indefinitely. And finally, the uniquely flexible BioBarrier FTW design operates using already tested and proven technologies.

9. This system offers a unique blend of benefits that concurrently provide a means to remediate hydrocarbon nutrients while also providing a platform from which to provide containment. Floating Island Environmental Solutions, based in Baton Rouge, Louisiana, and five other licensed manufacturers have the proven experience to build BioBarrier FTWs in significant volume (up to eight linear miles per day initially) and durable enough to function in a marine environment. In the past fifteen months, the Floating Island International group has launched hundreds of thousands of square feet of similar FTW systems around the world. Currently, one thousand linear feet of BioBarrier FTW has been deployed in the Gulf region through contracts with individual parish authorities. With sufficient contracting arrangements and strategic deployment partners in place, our nationwide network of manufacturers and suppliers would begin production of the required quantity of BioBarrier FTW's immediately.

SECTION B: Rough Order of Magnitude (ROM) Cost:

Estimated cost of one 1,000 linear foot (125 12”D x 20”W x 8’L modules) section of BioBarrier FTW delivered to water’s edge, including anchoring:	$50,000.00
Cost per square foot:	$30.00

The cost of the total effort depends upon scale and timing.

This technology is remarkably straightforward. Operations and maintenance is truly minimal. The system is not motorized; it requires positioning and maintenance of that position. The system can be designed to be self-anchored, tethered to an existing vessel, or tethered to a platform.

The BioBarrier FTW is designed to be eminently flexible. The BioBarrier FTW can be constructed to any size, dependent upon the deployment strategy deemed most strategic (i.e. large, long versions or multiple smaller, shorter versions). It can operate in the open ocean or it can operate to protect in-shore waters and shoreline. The modularity of the design also reduces costs and shortens response time because it allows for rapid expansion of existing units already placed in strategic locations.