

Program Name

Interagency Alternative Technology Assessment Program (IATAP)

Research Opportunity Title

Deepwater Horizon Response

BAA Technology Gap Area Addressed

Traditional Oil Spill Response Technologies

Name and Address of Submitter

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## Section A: Technical Approach

### Overview of Current Methods to Clean Beach Sand

The unprecedented quantity of oily debris and tarballs washing ashore on pristine Guld Shore beaches has prompted governments, cleanup agencies, hotel and beach managers to search for a cost effective tool for oil cleanup. Responding to that need, Equi-Tee Manufacturing now offers their specialized oil cleaning Flex'n Fork™, smaller Sift'n Fork™ and motorized Shake'n Fork-TF. These ergonomically designed forks are optimized to economically and effectively separate the sand from the oil spill debris. Equi-Tee manufactures these unique tarball picking forks with optimal tine spacing of only 5/16<sup>th</sup> and 3/16<sup>th</sup> of an inch for the manually agitated forks. The basket for the



powered version has a ¼ inch screened mesh affixed to the tines. Ideal tine spacing insures that only the tar balls or debris is captured, leaving more clean sand on the beach.

Cleaning beaches by hand is a labor intensive and tedious process, especially when picking up tarballs using the traditional hand tool selection of heavy shovels, rakes, screens, and bags. Using these tools is terribly inefficient, uses manpower ineffectively, and often generates a mountain of garbage bags mostly full of clean beach sand and only a small percentage of oil.

**Imperfect Method 1:** *Worker one* scoops up small tarball with a shovel. Along with the tar comes a large volume of clean sand which is dumped into the bag *worker two* is holding. After three or four scoops, the bag has reached its recommend fill level and set aside for disposal. Most bags hold less than 10% of their contents in tar balls so an excessive number of bags are filled with minimal beach remediation.

**Abysmal Method 2:** *Worker one* scoops up the tarballs and sand with a shovel and dumps it into *worker two and three's* screened sifting tray. These workers proceeds to manually agitate the screen, then dump the remains into the bag that *worker four* is holding. Although this method puts a higher percentage of oily debris into the bag, it does so at a terrible cost in manpower with four men working to separate each shovel full of sand.

**Best Practices Method!** *Worker one* uses his Equi-Tee Shake'n Fork to gather the tarballs and sand into a row or pile. He then uses the auto-sifting function to quickly and effortlessly sift virtually all the sand from the tarballs. The oil is dumped into a bag, with a far larger percentage of the contents being tarballs. Ideally the Shake'n Fork operator should be part of a four person team, where two other workers are gathering the oily sand into piles or rows. Then one worker holds the bag open and the other sifts out the sand and deposits the oil into the bag. If a large bucket or container were used, bag use could be eliminated altogether.

## Equi-Tee™ Forks: a Better Technology Solution for Beach Cleanup

Reducing the labor required to clean beaches by using Equi-Tee forks results in savings for both the worker and their employers. The wasted effort of hoisting and dumping a laden shovel, or agitating an improvised sifting screen tool, is instead converted into useful productivity. Shorelines are cleaner, tourists are happier and costs associated with sand replenishment and removal is greatly reduced. With these specialized forks, the same number of workers can clean far more efficiently, picking oil debris from up to 10 times the beach area in the same amount of time. In addition the volume of sand waste is greatly reduced, making this waste easier to transport, store, and eventually dispose of.



### A Version for Every Need

**The Equi-Tee Flex'n Fork** with a **Mini-Tine**(tm) basket is the most effective way to manually clean oiled debris, seaweed and tar balls from wet or damp beach sand. A screened version, with the mesh integral to the fork, is available for dry sand.

The smaller ½ size **Sift'n Fork** is best for spot cleanup. Both tar ball picking forks quickly and easily separate the sand from the oil spill debris so that all you dispose of is



the oil, leaving more clean sand on the beach. Equi-Tee Manufactures these specialized forks with an optimized tine spacing of only 5/16<sup>th</sup> of an inch apart. The patented Mini-Tine forks pick up the smallest tarballs, yet lets the beach sand sift through. With a full length handle it ends the continual stooping to pick up tar balls, and allows beaches to be quickly and effectively cleaned of oil and debris. The **Mini-tine**™ fork is also suitable for use from boats to capture floating waste, straw and marsh debris, as well as oil absorbent pads or other oil collection materials. Unlike a shovel, Equi-Tee forks will sift only the oily debris from wetlands and leave the water behind.

**The motorized Shake'n Fork** is for efficiently cleaning large expanses of beach by hand, or where motorized sifters cannot be used. It is similar the Flex'n Fork, but has a 1/4 inch screen that is built into the basket. Most screened tools will only sift dry sand through the screen. However, because this is a powered fork, even damp sand easily sifts through. An integral motor automatically performs the function of manually sifting the sand, so all the operator needs to do is hold the grip and squeeze the variable speed trigger. It incorporates rechargeable Lithium Ion batteries and a small motor with variable speeds to gently agitate the tines without



breaking the debris. This automatic sifting function speeds the process of cleaning while greatly reducing the effort required to manually sift.

## Light Weight and Durable

Equi-Tee sand cleaning forks are constructed from ultra-strong polycarbonate in both basket sizes. They have a patented flexible backbone, making them extremely durable and resistant to tine breakage. They are mounted to a full length fiberglass shaft with a comfortable ergonomic grip. Unlike tools with wood or metal handles, they don't get hot in the sun and can withstand immersion with no ill effects. They are chemical, oil, and salt resistant, making them ideal as an oil spill cleaning product. Equi-Tee forks function as rakes, shovels and screens, eliminating the need to carry multiple sand cleaning tools. It is not necessary to have two laborers, one to shovel up the goo and sand, and another sift or hold a bag. One worker can do it all! [There are no other beach cleaning tools that will sift sand and pick oil soaked debris as effectively as a Equi-Tee forks.](#) The auto-sifting Shake'n Fork is the only hand tool of its kind in the world, eliminating virtually all excessive sand removal.



Equi-Tee Forks are patented (7,222,899/7,222,900) and are sold worldwide. They have been used and proven in the agricultural industry (for sifting horse waste from stalls and cleaning outdoor pastures), in the pet market (cat litter tool) and for recreational lake shoreline cleaning where debris or seaweed removal is required. They are also used to incorporate oil bio-remediation bacteria into beach sand.

## About Equi-Tee Manufacturing

Equi-tee Manufacturing is located in Medford, Oregon and operates injection molding machines using our own tooling. All of the assembly is done in-house. The Flex'n Forks and Sift'n Forks can be produced at a volume of several hundred each day. The Shake'n Fork can be produced at a rate of 10 each day, although this could be accelerated if necessary.

## Shipping

Equi-Tee forks can be shipped via UPS to any location in the USA, FOB our warehouse. Except for attaching the basket, they are fully assembled. Larger quantities can be shipped on a pallet via truck.

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## Section B: Rough Order of Magnitude (ROM) Cost:



The list price of an Equi-Tee Flex'n Fork with either a Mini-Tine or Standard-Tine basket is \$57.00 USD. Bulk purchases of 10 or more per shipment qualify for a discount of 30%, with a final cost of \$39.90 per fork. One fork would be required for each worker. If a 9 person crew uses this fork then the acquisition cost would be \$359.10.

The list price of an Equi-Tee Sift'n Fork with a Mini-Tine basket is \$52.00 USD. Bulk purchases of 10 or more per shipment qualify for a discount of 30%, with a final cost of \$36.40 per fork. One fork would be required for each worker. If a 9 person crew uses this fork then the acquisition cost would be \$327.60.

The list price a motorized Shake'n Fork TF is \$309.00. Bulk purchases of 25 or more qualify for a discount and the final cost of \$249.00 each.

Potential savings: Using at Equi-Tee Fork, if each crew member worked independently as shown in our best practices method, the beach could be cleaned in less than 1/3 the time of the worst method commonly being used. In addition, the savings in disposal costs obtained by reducing the volume of unnecessary sand collection could be substantial.