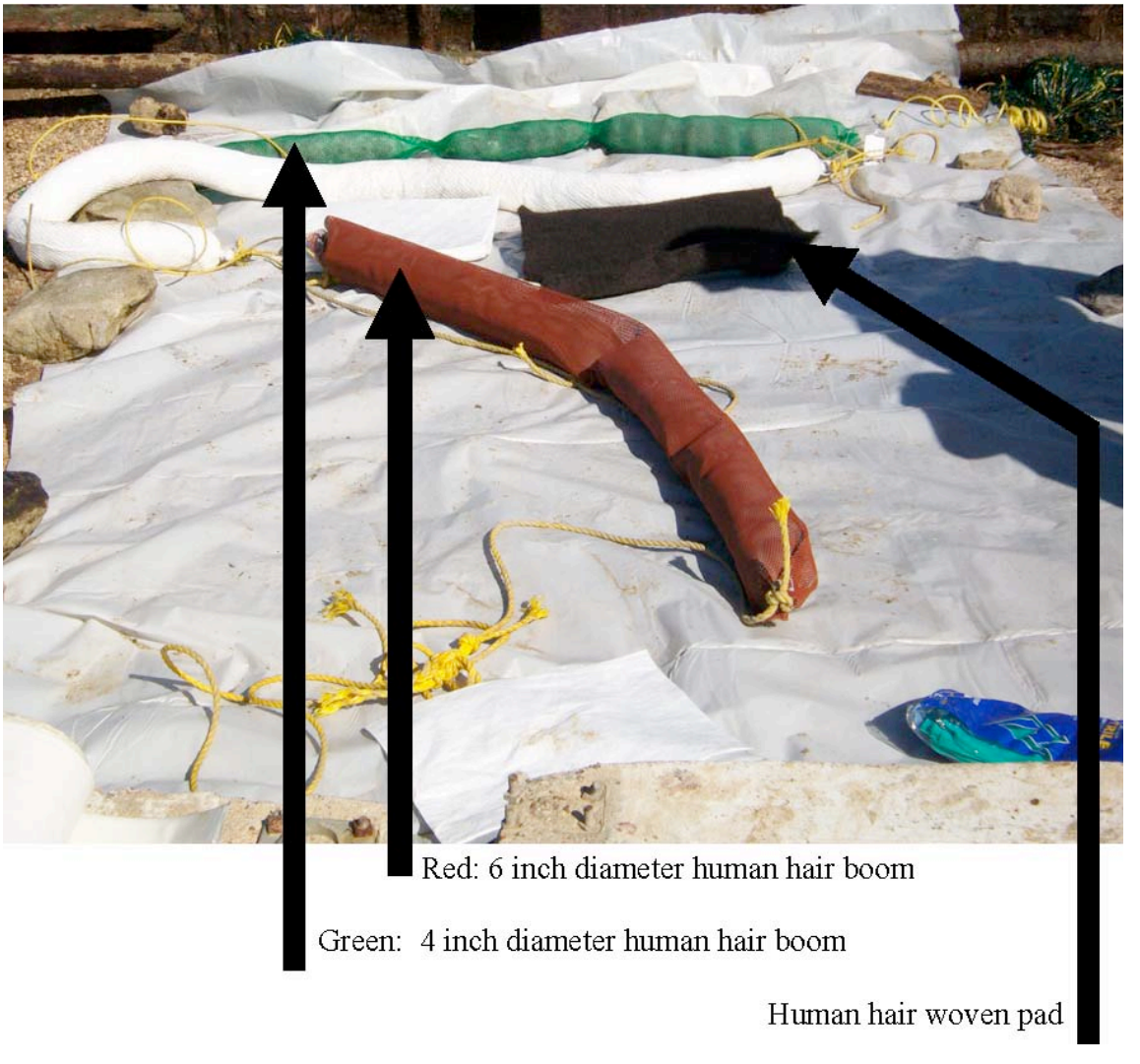
Field Test of Human Hair Sorbent Material Conducted during the Eagle Otome Incident Port Arthur, TX (February 6, 2010)

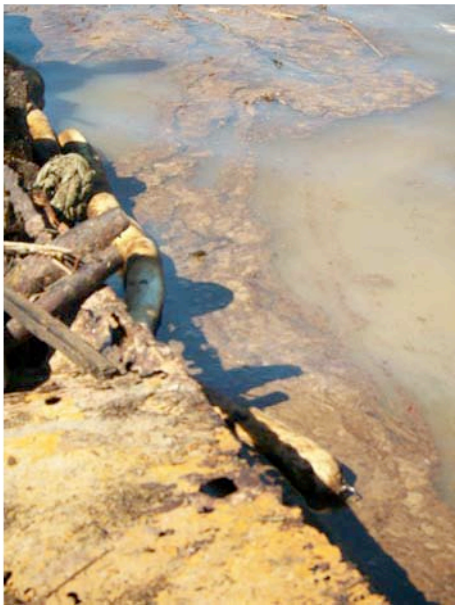
On July 23, 2010, the tanker vessel Eagle Otome and a barge collided on the Sabine-Neches Channel in Port Arthur, TX, spilling 11,000bbls (462,000gal) of crude oil. During response operations for this incident, samples of human hair 'sorbent' boom were received from John J. Thurston, Program Manager for Matter of Trust (an ecological public charity that concentrates on Manmade Surplus, Natural Surplus, and Eco-Education). These sample booms consisted of human hair packed into a cloth tube and reinforced by polypropylene netting. These 'hair' booms were of various diameters and were approximately 4 to 6 feet in length. Also received from the Matter of Trust organization were woven pads made entirely of human hair. (see pictures below)



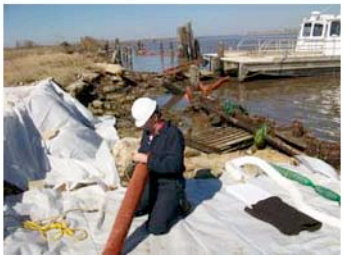
After receiving the samples, it was determined by the Environmental Unit that an efficacy test should be conducted. On February 6, 2010, members of the Environmental Unit found that there was adequate floating oil still available at the Equipment Decontamination Site located along route 87, south of Keith Lake. Within the Decon Site, the field test location was chosen because it was least intrusive to Decon operations and still had enough oil to measure efficacy. This is where the test took place.

At the time of the field test, the oil had been subject to weathering processes for 13 days. The oil at the site was emulsified and mixed with biological matter and other debris.

Set-up:



To alleviate shore-side oiling, and serve as a deployment and retrieval platform, two plastic sheets were placed near the test site. The 'hair' boom was visually compared to the standard sorbent boom (white) used during the response. (see pictures below).



All ‘sorbents’ were tied off using 1/4 inch polypropylene rope for stability and retrieval.

Deployment:

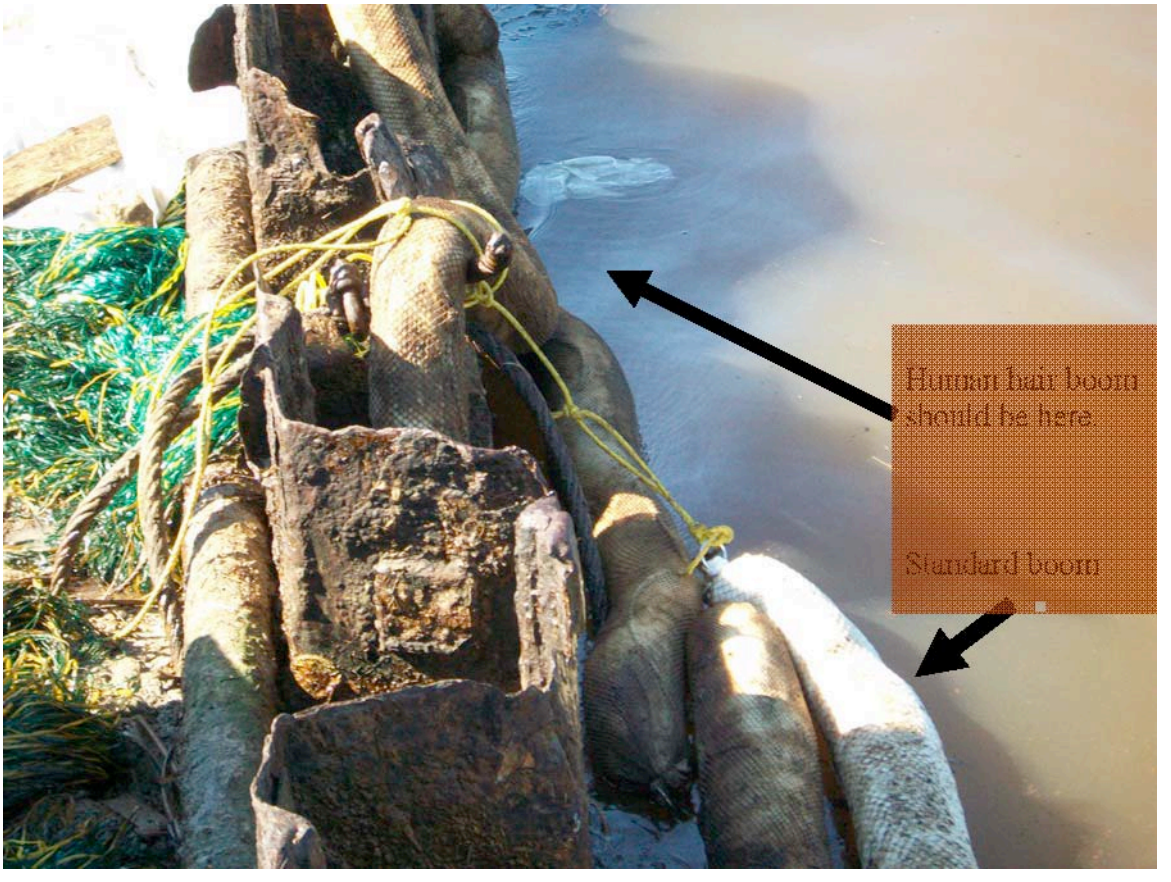
All 'sorbents' (booms and pads, hair and standard) were secured and prepared for simultaneous deployment. At 1300 CST, the field test began.

The pictures below show the ‘sorbent’ pads upon deployment.

Human Hair Sorbent Pad

Standard Sorbent Pad

All sorbent materials were deployed for one hour. After the set amount of time had elapsed, the following observations were made: 1) All human hair 'sorbents' (booms and pads) were completely submerged; 2) All standard sorbents (booms and pads) remained on the surface.



Line to the sunken human hair sorbent

Observations

All samples (booms and pads) were retrieved from the test site and placed on the plastic for observation. When the human hair sorbent was removed from the water, it was noticeably heavier than upon deployment, implying saturation, most likely by water. There was visible oil around the outside, and when the boom was compressed, oily fluids emerged. The exact amounts of oil and water is unknown.

Comparison

When the standard sorbent was retrieved it was much lighter in weight than the human hair sorbent. When compressed, the amount of fluids released was much less than the hair boom, implying less water absorption. The oil was more visibly evident on the standard sorbent.

Here is side by side comparison of the sorbent booms:

Sorbent Pads

Here is the visual comparison on the pads:

Conclusion:

The human hair samples appeared to have less than one hour of useful life based on their submerged state at the end of the field test. The human hair sorbents were only observed for oil removal on water. They may be more effective for oil removal in drier areas (i.e. beaches, rocks, etc). Based on visual observations, the standard sorbent (booms and pads) appeared to be more effective at removing oil from the surface of the water than the human hair 'sorbents'.

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