Helicopters were the only means to mobilize operations to the complex project site at Military Ocean Terminal Concord due to the sensitive habitat. PHOTOS COURTESY AHTNA ENVIRONMENTAL INC.

Nine Days in California

A Complex Remediation at Military Ocean Terminal Concord

What began as a 60-day window to perform the second phase of a complex remediation at Military Ocean Terminal Concord was significantly compressed by mission and weather constraints, yet undaunted, the project team completed the work in just nine days.

By Karina Quintans, M.SAME

When faced with a barrage of complex site conditions that are preventing the completion of a long-pending remedial action, effective project management and a solid partnership between the public and private sectors are crucial for success.

Since 1986, two contaminated sites at the U.S. Army's Military Ocean Terminal Concord (MOTCO) in California had experienced multiple phases of investigation, risk assessment and remedial design before the most appropriate and cost-effective remedial construction approach was finally identified in 2015. Ahtna Environmental Inc., with its considerable experience resolving long-standing environmental problems at Army installations across the southwest United States and Alaska, worked closely with the government to complete remedial action at MOTCO Sites 32 and 33.

Constant dewatering operations on the project were completed using a series of pumps.

At the project kickoff, an initial 60-day schedule for the second phase of a two-phase field plan was approved by the government. However, changed conditions (driven by an Army mission to process, ship and receive military general cargo and ordnance) compressed the schedule to 30 days. Inclement weather further complicated this 30-day window.

Site conditions were re-evaluated and the work approach revised. The remedial action for Phase Two ultimately was completed in just nine days. Here's how it was done.

PROTECTING WILDLIFE

The overall goal of the project was to place an in situ cap (clean soil on top of contaminated soil) within Site 32 (Mosquito Abatement Ditches) and Site 33 (Lost Slough) to protect the diverse wildlife.

The sites are located in a tidally influenced brackish wetland that was purchased to serve as a buffer zone for military operations. The wetland is transected by a natural slough, tributaries, and an extensive network of mosquito abatement ditches. Semidiurnal tides in the adjacent Suisun Bay cause the slough and ditches, which are generally partially filled with water, to flood and drain twice daily. The sites are contaminated with copper, arsenic, cadmium, and zinc as a result of historical spills from adjacent industrial facilities. Field observations also had shown the wetland area would completely saturate when high tides coincide with storm events.

To complicate the remedial action, the Army prohibited using vehicles to mobilize to the site because the wetland is a critical habitat for many federal and state-listed endangered species, including the Salt Marsh Harvest Mouse, California Black Rail, and Western Pond Turtle. All ingress and egress had to be performed using helicopters. Site conditions also changed daily, and at times, hourly, due to tide schedules. The field team experienced hailstorms, king tides, and intense rainfall due to El Niño. Strict security requirements complicated base access for locally hired field labor.

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COMPRESSED SCHEDULE

Given almost daily variability in site conditions—and with a field schedule highly compressed on the front end due to the nesting season for wildlife and on the back end due to a scheduled base mission that put the timeline constantly at risk—managing the project was akin to hitting a moving target, while on a moving platform.

Successful completion relied on three tiers of management with the right set of skills. A senior project manager brought the technical and leadership skills to design the project and keep it moving at all times without delay in coordination with the government, as well as proven problem-solving skills to address constantly changing field conditions "on the fly." A dedicated field manager was assigned to direct field production in accordance with the work plans and in coordination with the senior project manager. Additionally, two field leads assigned from Ahtna's Alaska headquarters were key for managing helicopter

The field team placed a total of 1,700 super sacks, each filled with 2,500-lb of dried Bay Mud, to create the in situ soil caps on Sites 32 and 33.

operations. The use of helicopters is rare for a remedial action in the Lower 48, and called for only under the most unique circumstances—all of which were present at MOTCO's Sites 32 and 33.

The two field leads brought 22 years of experience at hard-to-reach government sites in Alaska where the use of helicopters is an everyday occurrence. Their knowledge of aircraft procedures and safety; understanding of the tools and supplies needed for slinging operations; and a familiarity with the physics of flight and safely handling loads of up to 2,500-lb hovering overhead were of critical importance.

CAP CONSTRUCTION ON SITE 32

Prior to the Phase One placement of the in situ cap at Site 32, a biological survey and unexploded ordnance survey were performed. The caps were designed to isolate the contaminated sediments from benthic organisms and were constructed using helicopters to airlift bulk super sacks, each filled with 2,500-lb of dried Bay Mud.

The helicopter was guided by a spotter on the ground who communicated with hand signals to ensure placement of each sack on a target not much more than 1-yd^2. Once placed, a "boxcutter team" would cut an opening around the bottom of the sack. The helicopter then lifted the sack, allowing for controlled discharge of cap material through the opening. Following discharge of the Bay Mud, a "raking team" leveled out the cap material to the required thickness using hand rakes while the helicopter returned to the staging area to retrieve another sack.

To complete the cap within the revised nine-day period instead of 60 days, resources were tripled, for a total of three helicopters and 22 field crew and aircraft support personnel.

SITE 33: THE BIGGER CHALLENGE

Prior to starting Phase Two work at Site 33, MOTCO requested an early completion due to an upcoming mission. This immediately reduced the schedule from 60 days to 30. With El Niño conditions present, bringing intense rainfall, and a work window that coincided with unusually high tides (king tides) in November, on-time completion was at risk. A new plan had to be devised.

The tide schedule was mapped out to determine when tides would be lowest to ensure maximum control of the site. A nine-day period in November was identified and formed the basis for a revised operations plan. To complete the cap within the revised nine-day period instead of 60 days, resources were tripled, for a total of three helicopters and 22 field crew and aircraft support personnel. The work day was extended to 11 hours. And lessons learned from the Site 32 cap placement were incorporated to enhance efficiencies.

With such a shortened schedule, senior project management ensured every stakeholder, from the government to field laborers, was on board with the plan and focused on completing the mission. It was "all hands on deck" for nine days in a row to do whatever it would take to ensure on-time completion. This mindset was established from the get-go, after communicating and demonstrating that failure in any aspect of the plan would result in total project failure.

SUCCESS THE ONLY OPTION

With three helicopters running soil airlifts for Site 33, pilots coordinated daily with base operations on flight paths that were at times modified based on wind direction. Helicopters ran in an assembly-line fashion, with pilots in active communication to ensure sufficient spacing within the flight path. Each helicopter had an approximate 90-minute flight time before needing to refuel. A dedicated person performed all "hot refueling" (refueling while the helicopter engine is running) to keep operations moving.

Despite the detailed plans, once operations commenced at Site 33, the main slough was not dewatering as expected—again putting the project at risk. Aerial surveys were immediately performed to determine the source of water infiltrating the main slough. Work areas were then isolated using two additional 20,000-gal bladder dams and a series of temporary earthen dams. A dedicated team maintained constant dewatering operations. Within three days, 775 super sacks of cap material had been dropped and raked into place, completing the project on Nov. 13, 2015, ahead of the scheduled MOTCO mission by 17 days—and 48 days before the initially approved deadline.

In spite of the multiple obstacles, Ahtna, together with MOTCO, the U.S. Army Corps of Engineers and U.S. Army Environmental Command, formed a partnership with a commitment to harness all the resources needed and to never lose sight of the end goal, in order to finally complete a remediation 30 years in the making.

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