Army divers are a relatively unknown element of the Engineer Regiment. However, they perform many important missions around the world, such as underwater search and recovery, port opening and clearing, river reconnaissance, watercraft maintenance, hydrographic surveys, salvage operations, and underwater demolitions. The divers are a part of the U.S. Army Dive Company at Fort Eustis, Virginia. The company has five dive teams, two of which deployed to support Operation Iraqi Freedom. The following excerpts from journals kept by the authors describe a few of the missions they performed.

544th Engineer Team (Dive)

By First Lieutenant Christopher F. West

The 544th arrived in Kuwait on 30 March 2003 and moved north into Baghdad to link up with the 565th Engineer Battalion at Logistics Support Area (LSA) Bushmaster on 4 April.

9-13 April

We received our first mission from the 130th Engineer Brigade to help with the search and recovery of a shot-down F-18 and its pilot. At the crash site, we were notified that a Navy explosive ordnance disposal (EOD) team and a Marine expeditionary force reconnaissance team were also on-site. The Navy EOD team gave us the locations of the plane wreck and where the Air Force pararescuemen, or parajumpers (PJs), had found the pilot's parachute.

Both the 544th and the Marine team performed a hasty search using a side-scan sonar system. (See note on page 31.) We developed a plan and calculated a search area to look for the body of the pilot. We divided the area so the Marines would work from the south and move north and the 544th would do the opposite. When we recognized an object as a potential priority (such as the pilot, ejection seat, parachute, or cockpit), by means of the side-scan sonar system that parallels the shore in an attempt to locate foreign objects, the 544th would dive and verify each of these potential sites. We pulled out smaller wreckage pieces and brought them to shore. After several days of searching, something that looked like a body was spotted from a helicopter. Divers from both the Marines and the 544th verified that it was the pilot, and a medical evacuation aircraft flew the body back to Tallil Air Base. Later, Navy EOD personnel destroyed the F-18 using C-4, and the 544th disposed of the wreckage it had brought to shore.

Soldiers from the 544th Engineer Team (Dive) move out across the water to conduct a hydrographic survey for an upcoming river-crossing mission.

14 April

The 814th Engineer Company tasked the 544th to link up with the 565th Engineer Battalion to conduct a deliberate river reconnaissance of a potential assault bridge site at Objective Peach. A seven-man element collected shore and water data and took digital pictures of the near and far shores. The end state was a hydrographic survey with DA Form 7398, *River Reconnaissance Report*, and digital photos attached to it.

18 April

The 544th received a mission from the 565th Engineer Battalion to help the 101st Airborne Division recover sensitive items dropped in a canal north of the Karbala Gap. Eight soldiers had fallen into the 30-foot-deep water, following a light medium tactical vehicle (LMTV) crash, and had lost sensitive items. Surface swimmers looked for these objects, but after recovering only four weapons and a Kevlar® suit during the first hour, the team decided to put scuba divers in the water. By the end of the diving day, we had recovered equipment totaling more than $100,000.

23 April

A six-man reconnaissance team traveled with the 565th Engineer Battalion to Tikrit to conduct hydrographic surveys of the largest-ever military river-crossing site. While in Tikrit, the 544th pulled debris out of the work area for the bridge companies and helped the 74th Engineer Team (Dive) render hydrographic surveys.

27-28 April

A 13-diver team spent two days at Engagement Area Chamberlain, cutting four steel I beams with the underwater torch. The team also conducted salvage operations on the

new pontoons emplaced by the 671st Engineer Company. A hole in one of the pontoons caused it to sink, and the weight of the sunken pontoon forced another pontoon to sink also. The 671st developed a patch that could be used on the pontoons so they could pump out the water. Once the pontoons were floating, the divers plugged the hole in the one pontoon with a bolt. The entire area was cleared to allow bridging to continue.

4 May

Divers from the 544th met with Iraqi water treatment plant workers to determine the location of potential sea mines to the east of the bridge at Objective Peach. The workers, who spoke fluent English, believed that there were 40- to 500-pound sea mines on the shore but that there were none in the water. The divers used the side-scan sonar to search the area but did not find any mines.

4-9 May

Six divers supported the LSA Anaconda EOD team responsible for ridding the base of all unexploded ordnance (UXO) and munitions. The mission included lifting, moving, and hauling crates of ammunition to bunkers to completely backfill them.

8-12 May

The 544th began pumping water out of the canal just outside the fence of LSA Anaconda to help the 864th Engineer Battalion fill holes in the airfield with concrete and extend the landing strip. The divers were on call 24 hours a day to support this effort and used their new 180-gallons-per-minute pumps to conduct the mission. The trucks needed to be filled an average of six times a day to satisfy the requirement for concrete.

The 544th was tasked to find an area for conducting dive training in the vicinity of LSA Anaconda. A lake in AdDuval was only 15 kilometers away and seemed fairly large, so a team of divers went to determine the feasibility of diving and helocasting operations there. Upon arrival, the divers noticed a large cache of used, unused, unexploded, and exploded ordnance and munitions, which indicated that this was not a good place to dive. However, the team completed a hydrographic survey and determined the average depth of the water to be about 8 feet.

First Lieutenant West is the leader of the 544th Engineer Team (Dive) at Fort Eustis, Virginia. He is a graduate of the United States Military Academy.

74th Engineer Team (Dive)

By First Lieutenant P.J. Inskeep

After arriving in Kuwait on 14 April 2003, the 74th Engineer Team (Dive) met up with the 5th Engineer Battalion on 18 April at the Taji Airfield on the north side of Baghdad.

22-26 April

The team was notified of a river reconnaissance mission on the Tigris River in the vicinity of the city of Tikrit. Two members of the team convoyed to Tikrit with the command element of the 74th Engineer Company (Assault Float Bridge[AFB]), where they linked up with personnel from the 130th Engineer Brigade and the 299th Engineer Battalion and a reconnaissance team from the 814th Engineer Company (AFB). The initial assessment of the damage that two 500-pound bombs had created was that the bridge was blown in two different places, causing obvious structural damage. The current was so strong that we wondered if we could even get a diver down to the bottom. We took the initial data back to the 299th's tactical operations center (TOC), where the commander of the 130th began to devise a plan to fix the bridge. The 74th Engineer Company commander called back to Taji Airfield to prepare the rest of the team for a convoy to Tikrit.

Divers transport gear from the shore to the bridge site where diving is taking place.

Divers emplace detonation cord in preparation for clearing underwater obstacles.

A topographic detachment at 1st Brigade, 4th Infantry Division, headquarters provided the imagery we needed to complete a hydrographic survey. Back at the site, we collected near-shore and far-shore data using our Trimble TSC1™ data collector and took photographs to analyze the best method for clearing a lane for the bridge.

Using the side-scan sonar, we conducted a survey of the bottom of the river. We could see that there were no major obstacles in the middle of the river, but there were about 20 large trees and numerous small bushes in the way of the projected path of the bridge on the far shore. Also, there were two I beams under the surface of the water on the near shore where the bridge boats were being launched. The other boat left to conduct a hydrographic survey of the bridge site using the Global Positioning System (GPS), a high-precision depth finder, and Trimble software to collect the river depth data. After all the data was collected, we rendered the survey for the bridge companies using Terramodel™ software.

Divers from the 74th Engineer Team (Dive) stand on the shore as they watch a bridge blow after a demolition emplacement mission.

Meanwhile, other divers set up a surface-supplied station, which consisted of SuperLite (SL) 17K helmets, a communications box, air supply hoses, and a high-/low-pressure air system. Then, we inspected everything beneath the water and measured the diameters of the trees at their base to start a demolitions plan. We found the water to be about 10 feet at the deepest spot. After assessing the situation, we decided to let surface swimmers measure the diameters of the trees off of breath holds.

While this was taking place on the far shore, we conducted a reconnaissance of the two I beams under the surface by measuring the beams that were above the water's surface. From this, we developed a demolitions plan. We received permission from higher headquarters to set off the demolitions the next morning. One group was to remove the trees from the far shore and another would remove the two I beams. They rehearsed and planned three separate shots.

Two divers in scuba gear placed the charges. The divers had zero visibility in the water and were working against a strong current. The only sense they could use to emplace the demolitions was touch. Each diver emplaced the demolitions on the downstream side of the tree. The demolitions were then held in place by 550 cord (parachute cord), and we had detonation cord already attached to the charge and precut to 15 feet.

Once the demolitions were set, the detonation cord was tied to the tree above the water until the charges were correctly placed. Then surface swimmers ran a ring main to all the charges and tied them in, and we connected the modern detonation initiator (MDI) and ran it to the far shore for detonation. At the same time, we made sure the military police had cleared the bridge. After our first blast went off successfully, we emplaced the next round of charges and set up shearing charges to cut some I beams that had ruined the hull of a bridge boat the day before. The two sites blew simultaneously. The third blast was a single tree. Once the water was cleared, we helped pull the trees out.

27 April

The bridge companies wanted us to blow the rest of the little brush and cut out five light poles. We performed a reconnaissance, came up with a plan, and prepped the demolitions for it. The demolitions had to be in early that day so the bridge companies could rehearse their operations, so we emplaced them and by 0700 were prepared to blow.

One of the divers took on the task of removing the five poles. Having dived in fast current before, he thought it would be best to see if demolitions could be placed at the base of the poles to ensure that they were sheered completely and no longer posed a navigational hazard to the bridge boat operation. A diver went in the water off the Zodiac® inflatable boat moored to a pole. The current was too strong to even get to the pole safely. The diver tried to slide the demolitions down

the pole from the boat. However, weeds and brush had been pinned to the pole by the current, which prevented the demolitions from sliding to the base. We decided to try to put another diver in on the pole so he could shimmy down it. Again the current was too strong, and he could not reach the bottom.

We finally decided to cut the poles about 3 feet above the water and see if they were hollow. If they were, we could pack C-4 inside them and remove them with no problem. We took out a boat that a mechanic with the 74th had repaired—one that had belonged to Saddam. (We didn't think he would mind if we borrowed it to help his people!) On the boat, we set up an oxyacetylene cutter, and another boat was set up to pull the light pole away from the cutting boat so no one would get hurt. Once the poles were cut, we discovered they were hollow. We put charges inside each one, packed them with dirt and water, and blew them that night. The poles were removed, and the site was ready for the bridge.

28 April

Bridge construction began. We had a boat upstream and another downstream from the bridge, searching for enemies on the water. We also had an emergency surface swimmer ready in case anyone fell in the water and a scuba diving station set up as a quick-reaction force. The team searched the river, reporting every half hour. They spotted a couple of fishermen, but nothing serious. By 1300, the bridge was completed and we were pulling security up- and downstream from it. We did it during the daytime, and the infantry took over at night.

6- 8 May

We conducted our final day of reconnaissance for the destruction of the two Tikrit Bridge spans. One diver rappelled underneath the bridge to estimate what needed to be done. After receiving the demolitions from the 814th and 502d Engineer Companies, some of us were assigned to the near-shore span and the others the far shore. In emplacing the demolitions, our only problem was how to attach them to the bridge without causing further damage to the spans. The first explosion was a success; each span fell as we expected and no further damage was done to the bridge. We cleared the bridge and prepared demolitions to destroy the near shore span. When we set off the demolitions, the span was destroyed and the 38th Engineer Company (Medium Girder Bridge) began to emplace the Mabey-Johnson bridge.

9-11 May

A Black Hawk had crashed into the Tigris River near Samarra, and we searched for sensitive items. The divers also searched inside the helicopter for personal items of the pilots. Unfortunately, we discovered that all four men had died. (Their Kevlar suits were used the next morning for a memorial ceremony.) Later, we rigged up the helicopter to a crane and pulled it out of the water. We gathered all the bits and pieces that floated downstream and collected the data needed for a hydrographic survey.

14-15 May

We cut down I beams that were in the water so the 38th could use them for the Mabey-Johnson bridge. The men set up a surface-supplied station, brought out the hydraulic cutter, and went to work. The water was only 10 feet deep, but they could only see inches in front of their eyes. The small amount of oxygen on hand meant they could only cut down one I beam each day.

20 May

We found another lake within the compound. The divers located weapons and ammunition, which were taken to Tikrit North Airfield and disposed of.

First Lieutenant Inskeep is the leader of the 74th Engineer Team (Dive) at Fort Eustis, Virginia. He is a graduate of the United States Military Academy.

Both the 544th and the 74th Engineer Teams (Dive) continue to perform their unique missions in the barren regions of Iraq. In spite of the frustrations, the soldiers are experiencing satisfaction from a job well done and knowing that they are contributing to the very important Operation Enduring Freedom.

***Note:** The side-scan sonar is a method of underwater imaging that uses sound rather than light. The system consists of a processing unit above water, a cable for towing and electronic transmitting, and a unit beneath the surface (a towfish) that transmits and receives acoustic energy (sound) for imaging. The system was originally designed for ocean archeology, but its military application was recognized early on. The towfish, which looks like a 4-foot torpedo, contains a transducer and receiver that exchange signals within nanoseconds, using the speed of the boat and a GPS to create a picture on the attached computer. While the towfish is being pulled behind the boat, the transducer on either side of the towfish generates a half-inch sound signal. What is actually seen on the screen is sound waves bouncing off objects and creating shadows. The side-scan sonar, which is best used to find large objects, has made river reconnaissance quicker and safer, as well as making searches in larger bodies of water more accurate and more efficient.*