



# Contaminated Water Diving

Keeping divers and companies safe.

**C**ontaminated water diving, it carries all the risks associated with commercial diving, plus the risks of raw sewage, hypodermic needles, radiation, chemical exposure, poor visibility, precarious working conditions and cumbersome equipment. It's diving in water tainted by biological, chemical or radioactive waste. It's diving in what you wouldn't want to get on you. It's diving you have to put more thought into. And though it's some of the least desirable commercial diving work, it's becoming more and more commonplace.

"I mean the joke is, it seems like you never dive in water anymore, it's always water with something in it," says Tom Eason, who founded Eason Diving & Marine Contractors, Inc. in Charleston, S.C. in 1976.

There's a hint of truth to every joke, and Eason's seen the increase in contaminated water dives, with his divers changing out valves in the ash ponds around coal-fired power plants, "that's real contaminated," he says, or cleaning up oil spills with diver-directed dredging, "the diver's in the oil, so to speak."

Citing another scenario, Eason says, "We've worked an awful lot of marina fires where there's been a huge fire and many, many, maybe dozens of boats have sunk, so you've got all these chemicals in the water from the fire department, you've got some fuel still in the water, and yet you have to get in the water and get straps around things to clean the mess up, and you don't want to be in that water and have any skin exposed to these chemicals and fuels that are in the water ..." The arc of this story leads Eason to sum up the whole idea behind contaminated water diving: "It's recognizing that there's something in the water that you really

don't want to get on the diver or the crew and using the right equipment for that job."

Contaminated water diving jobs, or hazmat diving, frequently involves diving in chemical plants, nuclear power facilities, paper pulp mills, sewage treatment plants, agricultural run-off sites and even meat processing plants. These jobs are also conducted in places where the water may not be safe because of extreme PH levels, or in areas of severe urban flooding, where the contents of the water are unknown.

Typical tasks include inspection, maintenance and repair work on valves, sluice gates, bulkheads, pipelines and equipment, sludge and debris removal, and the recovery of miscellaneous objects, including bodies, all submerged in contaminated water.

The big story in contaminated water diving today remains the same. Like many conversations in diving, it centers on the need to educate clients so they hire the guys that are doing things right, legitimate diving companies, ADCI members, who know the perils before any problems occur, because too many people who don't have the proper training or equipment are doing this work and they're getting hurt.

"I often meet with potential clients that simply do not know the difference between a SCUBA diver and a well trained and equipped commercial diver," says Bryan Nicholls, President and Chief Operating Officer of U.S. Underwater Services, LLC. "Further to this point, I often find that they are unaware of the federal minimum standards for commercial diving operations, let alone 'best industry practices' such as the ADCI Consensus Standards. In these cases, they may unknowing hire 'Chuck in a truck' to conduct work that is well outside of that contractor's realm of expertise, manning and equipment levels, and even insurance coverages. This, in turn, puts personnel at greater risk and increases the potential liabilities of the end-user."

Eason has heard of stories that could serve as lessons too, a recreational SCUBA diver who went into water with a real bad PH and came out with a real bad rash. "That happens because people will take on a job and they don't have the money to buy the right equipment to do the job, so they just try to do it with whatever they have, a wet suit," Eason says.



Craig Fortenbery, president of the ADCI and Chief Executive Officer of Mainstream Commercial Divers, Inc., knows of cities that have hired SCUBA divers to work in sewage pipes in wet suits. “It’s just completely inappropriate,” he says.

Fortenbery acknowledges that saying this to ADCI members is like preaching to the choir, but he cannot express enough the importance of client education and preparation for the job. “The main thing is everybody needs to continue to work on client education and we as an industry need

to make sure we are doing our part to be approaching these types of jobs in a professional manner, make sure that our personnel do have the required training, the right equipment and so forth,” he says. “Then we need to sell the client on why that’s important and why it reduces their liability, why it makes for a much safer operation, how and why we are protecting the employees from the contaminants involved and why we’re doing it safely.”

The second point Fortenbery cannot stress enough when it comes to contaminated

water diving would be the preparation prior to the job, prior to putting the diver in the water. “When you plan one of these jobs, you need to take into account all of the potential hazards, including thermal hazards, including airborne hazards to topside personnel, splash hazards to topside personnel. How are we protecting them as well as the diver? How are we decontaminating the diver when we’re done?” he asks.

Preaching to the choir, as it may be, these diving contractors will continue to preach preparation, training and equipment so that the choir will spread the message to the masses, reach those that may be inclined to call up their local SCUBA shop or fire department and show them the light, teach them why diver safety is imperative and why they need to hire ADCI-certified contractors, to keep divers from coming into contact with contaminants.

“Aside from formalized commercial diver training, our divers undergo additional OSHA training in Hazardous Waste Operations and Emergency Response (or HAZWOPER), Hazardous Communications (HAZCOM), and the OSHA 10 Construction course,” Nicholls writes in an email. “We also provide additional in-house training on everything from safe diving operations, decontamination and emergency procedures, to blood borne pathogens. Our divers are also vaccinated for Hepatitis and Tetanus for Hazmat work that involves biological contamination (i.e. raw sewage or animal waste).”

Potential clients and any eager divers looking to pick up subcontracted work need to know that while tasks performed in contaminated water diving may be the same as other commercial diving tasks, the conditions are not. Standard commercial diver dress and personal protective equipment (PPE) will not suffice. From the helmet to the diving suit, quite a bit more planning goes into hazmat diving.

“For most contaminated diving, the most common type of suits are vulcanized rubber suits, and for seriously contaminated diving, those suits mate to the helmet and they mate to gloves and they completely encapsulate the diver, and the helmet has what’s called a series exhaust, so it has multiple exhaust valves to eliminate water seepage into the helmet. Some people, for really, really contaminated diving, also use what’s called an air hat, which is a positive pressure free flow hat rather than a demand regulator, although either one, if it’s configured

right, is adequate, but once again, it comes down to what level of protection is needed,” Fortenbery says. “Also, the major suit manufacturers, such as Viking, that make vulcanized suits have done permeation tests on their fabric and on the seams of their suits. That needs to be reviewed depending upon what type of chemical you’re getting into, if it’s a chemical contamination. There are some chemicals that have very quick permeation times, even with the best suits that are out there, so there are some situations that can be very difficult to safely dive in just because the suit won’t hold up. Those are things the diving contractor has to investigate, if they’re going into something that they’re unfamiliar with.”

Topside personnel must also be protected from contaminants while tending to diving operations. Depending on the job and level of contamination, this could include PPE such as face shields, Tyvek suits, chemical resistant gloves and over boots. Diving contractors must also consider air quality for topside tenders, as inhalation hazards can be quite common on contamination job sites.

“Proper manning levels are also a significant contributor to conducting a safe and successful hazmat diving operation,” Nicholls says. “Oftentimes, we will add a Diver Medical Technician (DMT) to the team, in the event that there is an incident related to contamination, hyperthermia or other diving related injuries.”

Diving in biological contaminants, there’s the obvious risk of infectious diseases. Diving in chemical contaminants, there’s the risk of carcinogens. Even when the water’s clear, contaminants might be hiding in the sediment. High temperatures can pose a serious risk too, diving in places like paper mills where the water temperature can rise to 120 degrees. Divers may have to wear more uncomfortable equipment and work in a confined space, all the while worrying about heat stroke.

“Oftentimes, we’re working in high temperature water, so there’s a lot of heat stress involved, so we have a special chiller suit to keep the diver cool in these situations and so forth, but it’s very important that the diver be monitored closely, and when the diver comes out, if the ambient temperature outside is very hot, that’s a problem too, because you can’t immediately take the equipment off,” Fortenbery says. “The diver now has to be decontaminated before you remove the

gear from him if it’s serious contamination, so you often have a zoned decontamination and the diver has to work his way through that to get his gear off of him so he’s not contaminated from what’s on his suit and on his helmet when he comes out, so again, that can pose issues that have to be taken into account when you’re preparing and planning for these dives.”

Every job site must be vetted to identify hazards specific to that job before commencing diving operations and a thorough Job Hazard Analysis (JHA) will help lay the groundwork for a safe and successful dive. “The ADCI Consensus Standards provides a great place to start regarding not only general diving operations, but also guidelines regarding JHAs, proper manning levels, equipment selection and decontamination procedures,” Nicholls says.

When it comes to contaminated water dives, companies have to hire contractors who know what they’re getting into, contractors who understand the gravity of the risks, the regulations and the requirements, above and below the water.

Communication between client and contractor is also key.

“Regarding any project that puts personnel at risk, it is always in the best interest of all project stakeholders to communicate with one another and attempt to mitigate risk wherever it can be found,” Nicholls says. “Oftentimes, a client or site rep knows far more about their own facilities and surroundings than a visiting contractor would, so they can provide valuable insight to the job planning process. Communication amongst all parties also ensures that each person knows their specific roles and responsibilities, as well as what to do in case of an emergency.”

ADCI member contractors may only make up a portion of the commercial diving industry, but ADCI members are vetted and audited by commercial diving subject matter experts, Nicholls explains, so they are held to a higher standard regarding compliance to federal regulations and internationally recognized best industry practices.

“With the right planning, equipment and attention to safety, hazmat diving can be as rewarding as any other type of commercial diving work,” Nicholls says. “The important thing is that we all go home safely at the end of each day and that we do not compromise on the steps that will get us there.”

**BREATHE FRESH**

**Nuvair**  
Compressed Gas Solutions

Manufacturing & Servicing for  
**OVER 25 YEARS**

- Air & Nitrox Compressors
- Boosters
- Nitrox Generators
- Analyzers  
CO, CO<sub>2</sub>, O<sub>2</sub>, HE, Moisture

**4 WAY PICK 900 LB GWT**  
**HP Air or Nitrox**

**LP Air or Nitrox**

**NUVAIR.COM**      **1-805-815-4044**