

Disposable Bailers used as a Sampling Tool for Groundwater Monitoring

Independent Report done by Indumark of end users using disposable bailers

Bailer users representing different types of groundwater monitoring firms, including contracting, consulting, engineering, and remediation, say that a disposable bailer serves as a preferred alternative to pumps, for groundwater sampling, while they retain the use of pumps for special needs.



Groundwater Monitoring Contractor

A Norman, an Oklahoma based groundwater monitoring contractor has used bailers successfully for about four years in compliance studies undertaken for both energy companies and municipalities.

"We like to avoid the use of pumps whenever we can, because they're expensive to buy and maintain, are prone to failure at the worst possible times and can be difficult to deploy at remote site along with their generators, trailers, tanks and drums," explained Dana Drury, field services supply manager for Atkins Americas Inc.'s Environmental Division.

"In trying out bailers as an alternative, we had problems with reusable types when protocol changed because they were too labor intensive to clean. Among the disposable types we tried, this one was heavy enough to handle the silt, sand and clay content of certain groundwaters we worked with, and also sealed the best to retain water."

Atkins typically purges three well casing volumes to establish pH, conductivity, and temperature readings within 10% and then samples for TPH, BTEK, metals, and pesticides, using the bailer for both purging and sampling.

The firm, with primary offices in Oklahoma and satellite offices in Texas, has performed groundwater monitoring assignment for both the private and public sectors in Texas, Oklahoma, Arkansas, Kansas, and Louisiana, for compliance determinations for both

state and federal regulations.

Consulting Firm

An environmental scientist performing remediation work for a consulting firm's field office in Roanoke, VA says avoiding pump cleaning is a major concern, and that the size of the bailer he uses also provides for additional convenience. He has used it for two years in studies undertaken for both oil companies and state agencies.

"I'll use a pump when my purging volume is 30-40 gallons, but I want to avoid them for my typical purge volume of 3 to 5 gallons, because of the need to decontaminate pumps after each use," explained Robert Wagner, environmental scientist for the Apex Environmental Inc. field office there.

"I don't want to have to take apart a pump and decon with cleaning solutions every time I move to another well. With this disposable device, I don't have to worry about that. I have heard it is acceptable to decon a pump just by running it in a bucket with decon solution, but even in that case, I'd just as soon not have to worry about a power source, Our use of bailers is clearly mentioned in our reports and we haven't heard any questioning, so I'm looking forward to continuing to use them."

In determining the exact nature of contamination by dissolved petroleum compounds like MTBE and BTEX, and measurements of volatile and semi-volatile such as Total Petroleum Hydrocarbons (TPH), Diesel Range Organic(DRO), and Gasoline Range Organic (GRO), he has found his 42" long, 1.66" diameter bailer to be especially convenient for sampling protocols.

"We're drilling monitoring wells to locate leaks and identify contaminants, including each plume's direction, speed, and location in relation to receptors such as supply wells, streams, lakes, and rivers," he said. "Once I got used to handling the bailer which didn't take long, it was very convenient for the protocols we typically observe."

"The bailer is perfect size to fill an amber, which is one liter, plus three 40ml voas. I need one amber for TPH-DRO, and then three voas for BTEX, MTBE, and GRO. When I have to go 40' down a well to sample, I'm glad I don't have to go back and do it again just to fill one more voa."

"This particular bailer, with weights on the outside both top and bottom, was the one in use when I started almost two years ago. I tried the one they were using previously, which has a weight inside on the bottom, and the new one is much better, filling quickly and easily as it descends."



Environmental Engineering Firm

A project manager supervising remediation work for an environmental engineering firm says an alternative, low-flow sampling technique is deemed necessary only for special conditions.

"The new bailer works well for the groundwater sampling we typically need to do regarding compliance aspect for work such as solid waste landfill environmental management, site assessment, and real estate transactions," he reported.

"One exception is with some of the project work plans approved by the regulatory authorities at sites where turbidity has been a problem," he noted. "Where historic sampling referred to during plan development shows turbidity readings above 50 NTU, we'll use bladder pumps as an alternative, low-flow sampling technique."

"But even there that's really more function of the personnel using bailers than any limitation of the bailer itself. If you take your time and go slow, it can work fine in high turbidity situations. A second exception is that when the volume of water to be removed exceeds 7-10 gal., we'll also tend to use a pump. But overall, this bailer is our most consistently utilized sampling tools."

Consulting/Remediation Firm

The owner of an environmental consulting and remediation firm in Ridgeland, MS reports considerable savings through the use of the new disposable bailer.

"It saves us about \$35 per well that would otherwise have been required for labor and lab testing for pump decontamination," reported Blake Partridge, P.E., owner of BAPCO Environmental, Inc. "That's a significant impact on costs, since we're typically sampling 5 to 15 wells at the underground storage tank sites that represent most of our activity."

"It means we can avoid the labor for decontaminating the pump between wells, which consists of running it in soapy water till clean, then running it in clean tap water, followed by rinsing with alcohol, and then circulating deionized or distilled water through it. Plus, we save the out-of-pocket expenses for using dedicated hoses and for collection of and sending out a field rinse blank to the laboratory for analysis. The rinse blank is required to prove we didn't take contamination from well to well."

"We now reserve use of our pump typically for wells that are deeper than 50', and that easily yield 15 to 25 gallons water. We normally purge five well volumes, which would take too long with a bailer for that much water at depths of more than 50', but we still use

the bailer to collect the sample, which we take after well is recharged back to 75% of the original water level."

Partridge said he has used the new bailer primarily to look for MTBE, BTEX, and PAH in groundwater at retail gasoline sites, and also for sampling all priority pollutants for industrial sites and real estates transactions.