



BESST INC.

**GLOBAL SUBSURFACE
TECHNOLOGIES**



Products and Services

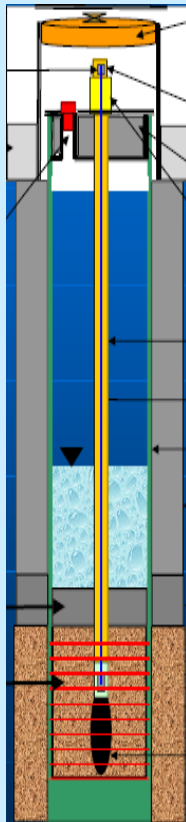
BESST Inc. is the leader in advanced systems for the environmental and water resources industries around the world. We provide a comprehensive range of subsurface monitoring and sampling technologies and services:

- **Barcad Pumps**
– Single Barcad Pump for Groundwater Monitoring
- **Barcad Multilevel Pump Systems**
– Multilevel Barcad Pump System for Groundwater Monitoring



Barcad Pumps – Single Wells

Barcad Pumps are the most durable, reliable, efficient and cost-effective purging and sampling system available for monitoring wells with one zone. Barcads are driven by BESST's gas displacement technology, and have been in operation in North America in all environmental conditions – **in deep burials, running rivers, landfills, and many others** – since the 1980s.

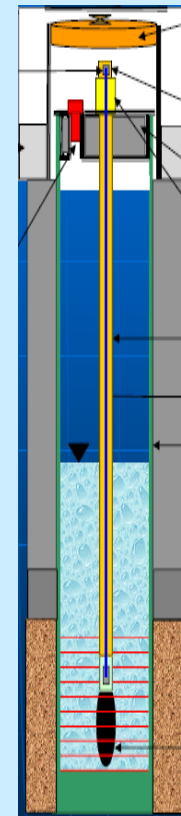


Single Barcad pumps are **embedded or suspended** in open bores and cased wells.

Embedding Barcads in annular materials reduces the purge volume at each screened interval.

A bentonite layer above and below a sand layer at the screen eliminates the stagnant water interface.

Barcads are also suspended with or without packers.

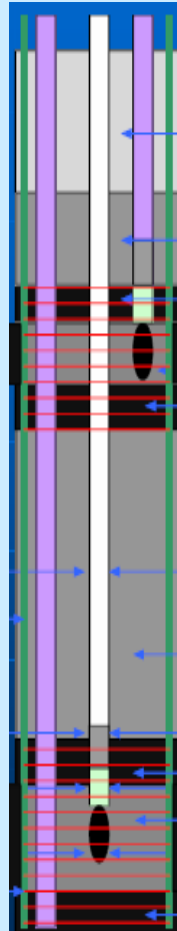


Barcad Pumps – Multilevel Wells

Multilevel Barcads provide **simultaneous purging and sampling capability of up to 10 zones per well**. Installed in nested configurations, Barcad Pumps are the most durable, reliable, efficient and cost-effective purging and sampling system available for monitoring wells with multiple zones.

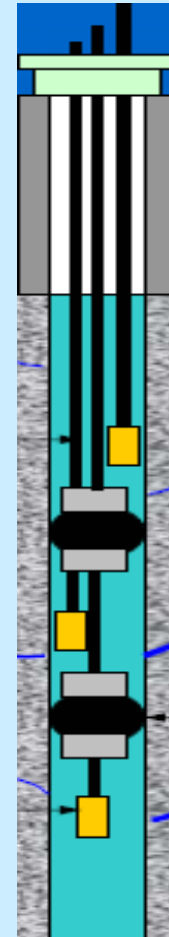
Multilevel Barcad systems are embedded or suspended in monitoring wells under all geologic and climatic conditions. Similar to single Barcad installations, multilevel Barcads can be embedded in sand and bentonite. In suspended systems, up to 10 zones can be installed with the packer system BESST developed for tunnel projects in Japan.

Integrated Fiber Optic Sensors allow for simultaneous water level, temperature, or refractive index parameter measuring.



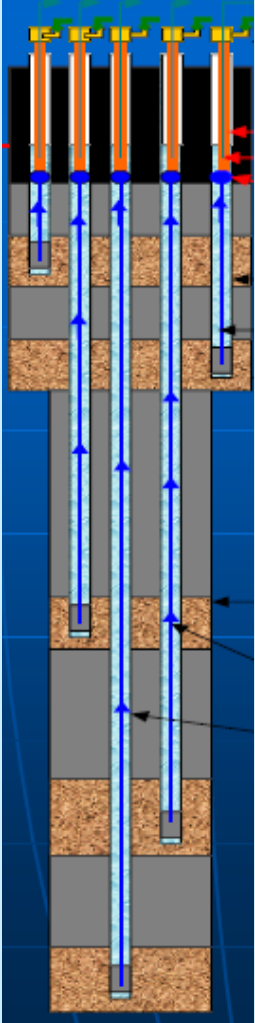
Multilevel Barcad systems are installed with straddle-packer assemblies within competent bedrock boreholes, or within encased boreholes with multilevel screens.

With Mud Rotary Drilling to install Multilevel Barcads, a multilevel screen is installed to support the borehole. After developing each screened zone, Multilevel Barcads are installed with annular materials or packers. As shown on the next page, other drilling methods may be used.



Barcad Pumps – Multilevel Wells (continued)

Examples of Barcad project types and drilling methods:



- Direct burial of Nested Multilevel Barcad pumps within a borehole with temporary casing
 - Hollow stem auger, air rotary casing hammer, dual wall percussion / Becker rig, sonic and other casing advance methods
- Direct burial of Nested Multilevel Barcad pumps within a permanent multilevel screened casing
 - Mud rotary, air rotary
- Direct burial of Nested Multilevel Barcads within a continuous screened casing
 - Mud rotary, air rotary
 - Within existing monitoring well or water production well
- Multilevel Barcads with straddle packers within open bedrock boreholes
 - Mud rotary, air rotary, diamond core, sonic
- Multilevel Barcads with straddle packers within a permanent multilevel screened casing
 - Mud rotary, air rotary
- Barcads retrofitted within existing multilevel piezometer nests
- Multilevel Nested Barcads installed within angled boreholes in either direct burial or straddle packer configurations
 - Hollow stem auger, sonic, diamond core drilling, mud rotary

Barcad Pumps – Multilevel Wells (continued)

Below **6 Barcad zones** are installed to **600 ft.** BGS inside a 6-inch diameter multilevel screened casing.



BESST's 6-way Barcad Control Unit is used for simultaneous groundwater purging and sampling of all zones.



Nitrogen gas drives the **Barcad gas displacement technology**. A 66 gallon liquid nitrogen gas tank produces 4,800 cubic feet of nitrogen gas.



Fiber Optic Pressure Sensors are resistant to EMI and RFI. Our data loggers can track 1 to 256 channels simultaneously. An 8-channel data logger is used for this 6-zone Barcad installation.

