Groundwater Sampling Techniques

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Sample Collection

- Objective: Collect a sample representative of groundwater residing in the area of interest

- Groundwater Collection Procedure
  - Measure water levels
  - Purge wells and collect field data
  - Collect samples

Sampling Equipment

- Bailers
  - Adequate for all contaminants
- Portable Pumps
  - Peristaltic Pumps, Vacuum Pumps
    - Not recommended for volatiles
  - Submersible Pumps
    - May be used for all contaminants at low flow rates
- Dedicated Pump Systems
  - May be used for all contaminants at low flow rates

Bailers

- Use care to minimize agitation of water in wells
  - Measure water level and calculate well volume
  - To purge, lower bailer slowly into top of water column and withdraw carefully to remove appropriate volume
  - To sample, lower bailer slowly to desired well depth, allow to fill, withdraw sample carefully
- Clean bailers between wells or use a separate cleaned bailer for each well

Portable Pumps

- Use pumps to purge wells when sampling with a bailer or pump
  - To purge, lower pump slowly into top of water column, continue to lower as needed to remove required volume
  - To sample, lower pump to desired depth, adjust flow rate, collect samples
- Use low flow rate pumps to purge and sample turbid wells
- Use flow rates <100 ml/min for volatiles
  - Do not use peristaltic or vacuum pumps
- Clean pumps between wells

Dedicated Pump Systems
(Permanently Installed, Sealed)

- To purge and sample, connect power supply and sample collection tube, purge appropriate amount, adjust flow rate , collect samples

- Best equipment to use for long term sampling
  - No outside contamination
  - Less purging
  - Easy to sample; low-flow sampling achievable
  - Uniform sampling from the same depth
  - No between well cleaning required

Potential Sources of Contamination
(From Sample Collectors)

- Containers/equipment contact with ground and other surfaces
- Touching insides of sterilized containers
- Collecting samples with dirty gloves
- Smoking near samples
- Vehicle exhaust fumes or other fumes

Sample Collection Tips

- Properly purge stagnant water from the well (field parameters stabilize)
- Collect samples within a reasonable amount of time after well purging (not more than 24 hours)
- Use appropriate sampling equipment
- Use appropriate sample containers (Example: Sterilized bottles for coliform samples)
- Clean sampling equipment between wells
- Use proper sample preservation techniques (Example: Pack samples in ice)

Sample Collection Summary

- Measure water levels
- Properly purge wells and collect field data
- Collect samples
- Pack samples for transport
- Transport the samples to the laboratory as soon as possible after collection (make sure holding times are met)