

Table 5.5
Biology Sampling Equipment

Biology Program Sampling Capability

Parameter Group	Sample Source
Algae for taxonomy	Surface water
Benthic macroinvertebrates for taxonomy	Surface water, sediments
Bioassays	Surface water, effluents, leachates
Microbiology	Surface water, sediments, effluents, leachates
Physical/Chemical analyses	Surface water, effluents, leachates

Effluent Sampling Equipment List

Equipment Type	Use	Parameter Groups	Restrictions/ Precautions
Glass bottles (with or without sodium thiosulfate pill)	Sampling	All bacterial parameters; BOD; toxicity bioassay and AGP/LN algal assay; organics; oil and grease; nutrients.	(4)
Plastic bottles (with or without sodium thiosulfate pill)	Sampling	All bacterial parameters; BOD; AGP/LN algal assay; nutrients; metals	(4)
Niskin bottle (Teflon lined)	Sampling	Toxicity bioassay; chemical analyses	None
Disposable latex or latex-free nitrile gloves	Sampling	All	Replace between sample sites
Polypropylene dip sampler	Sampling	All	Clean between sites
Stainless steel bucket	Sampling	Toxicity bioassay	(6)
Pump, submersible	Sampling	Toxicity bioassay	(7)

Surface Water Sampling Equipment List

Equipment Type	Use	Parameter Groups	Restrictions/ Precautions
Hester-Dendy multiplate sampler	Sampling	Benthic macroinvertebrate	(1,3)
Dip net	Sampling	Benthic macroinvertebrate	(2)
Sieve	Sampling	Benthic macroinvertebrate	(2)
Glass jar and pipettes	Sampling	Periphyton algae	None
Formalin	Sample preservation	Benthic macroinvertebrates, periphyton algae for identification	(5)
HCl & H ₂ SO ₄	Sample preservation	Metals, organics, nutrients, as appropriate	Replace each trip
Lugol's solution	Sample preservation	Phytoplankton algae for identification	Will stain skin, clothing
Narrow-range pH paper	Acid-preservation check	Metals, organics, nutrients, as appropriate	None
Waders	Sampling	Benthic macroinvertebrate, periphyton & phytoplankton algae	None
Glass bottles	Sampling	All bacterial parameters; BOD; toxicity bioassay and AGP/LN algal assay; organics; oil and grease; nutrients; algal toxins.	(4)
Plastic bottles or vials	Sampling	All bacterial parameters; BOD; phytoplankton; AGP/LN algal assay; nutrients; metals; periphyton	(4)
Niskin bottle (Teflon lined)	Grab sampling at specific depth	Toxicity bioassay; chemical analyses; plankton	None
Van Dorn bottle	Grab sampling at specific depth	metals, nutrients; plankton	None
Stainless steel bucket	Sampling	Toxicity bioassay	(6)
Pump, submersible	Sampling	Toxicity bioassay	(7)

Sediment Sampling Equipment List

Equipment Type	Use	Parameter Groups	Restrictions/ Precautions
Ekman Dredge	Sampling	Benthic macroinvertebrates; grain-size; chemical analyses	(8)
Petite Ponar Dredge	Sampling	Benthic macroinvertebrates, grain-size, chemical analyses	(9)
PVC Coring Device	Sampling	Benthic macroinvertebrates; grain-size; chemical analyses for metals, nutrients	none
Young modified dredge	Sampling	Benthic macroinvertebrates	(2)
Tray, porcelain, plastic & stainless steel	Sampling	Benthic macroinvertebrates, mixing samples for chemical analysis	(10)
Plastic scoop	Compositing; Sampling	Grain-size; chemical analyses for metals, nutrients	none
Wash Bottle	Sampling	Benthic macroinvertebrates	none

- Plates that have been contaminated with toxicants or preservatives cannot be reused.
- Sieve must be a U.S. Standard No. 30 (28 meshes per inch, 0.595 mm openings). Dip-net mesh must be no larger than U.S. No. 30.
- Vandalism can be a problem at sites with public access.
- When chlorinated waters are collected, the sample bottle must contain sodium thiosulfate as a dechlorinating agent for bacterial sampling other than BOD or Microtox.
- Formalin should be buffered to a neutral or slightly alkaline level with sodium bicarbonate.
- Bucket will be pre-rinsed with water to be sampled before collecting actual sample.
- Submerge intake hose/tubing below surface of water to be sampled, whether effluent or receiving body of water. Run pump for 5 minutes prior to collecting sample to thoroughly flush pump and its hoses/tubing.
- Light weight so that jaw does not penetrate hard substrates; inefficient in deep water or where there is moderate current.
- Less efficient in coarse gravel; jaws can be blocked by stones, sticks, and other debris causing loss of part of the sample; not efficient in swiftly flowing water of over one m/sec velocity.
- Tray should be white to facilitate complete rinsing of the material into the sample container.