

**Nebraska Department of Environment and Energy
Standard Operating Procedure (SOP)**

**Water Quality Division
Water Quality Assessment Section – GW**

SOP Number: GW-030

Title: Groundwater Sampling Equipment and Supplies

Written Date: July 2024

Purpose: To provide a standard listing of groundwater sampling equipment and supplies, and to describe proper maintenance activities.

Equipment/Materials Needed:

See Appendix A: Groundwater Sampling Equipment/Materials list.

Procedures:

1. Obtaining equipment
 - 1.1. Equipment and supplies as listed will be maintained either on hand within the Groundwater Section or obtained through the DHHS lab or other supplier.
 - 1.2. To access equipment on hand, go to the NDEE Bio Lab located at 245 Fallbrook Blvd.
 - 1.3. If you are utilizing any equipment for an extended period of time or if it is not for a normally scheduled monitoring action (e.g. GWMA study, etc.), inform the Section Supervisor and other Section members of your equipment use, so there is some general knowledge of who is in possession of what equipment.
 - 1.4. In some cases, equipment not on hand within the Section is available from other Sections. Before purchasing equipment, consult with other appropriate Sections or Divisions (e.g. Petroleum Remediation Section, Land Monitoring Section, etc.) to see if they have appropriate equipment for loan.
 - 1.5. If necessary equipment is not on hand within the agency, consult with Section Supervisors regarding purchase or rental.
2. Obtaining supplies
 - 2.1. For ordinary groundwater sampling supplies (e.g. bottles, preservatives, deionized water, etc.), contact the DHHS lab or outside supplier far enough in advance to ensure adequate time for delivery.

- 2.2. For specialized sampling supplies (e.g. refills for field test kits, etc.), coordinate with Section Supervisor and specific project manager to order/purchase the necessary items.
3. Instrument/equipment maintenance
 - 3.1. pH meter--separate probe
 - 3.1.1. Calibrate instrument regularly as per GW-070.
 - 3.1.2. When not in use, store probe with tip immersed in deionized water or 7.0 pH buffer solution.
 - 3.1.3. For long periods of storage (greater than a few days/weeks), remove batteries and disconnect probe lead.
 - 3.2. pH meter--wand type
 - 3.2.1. Calibrate instrument regularly as per GW-070.
 - 3.2.2. When not in use, store meter with probe cap firmly in place.
 - 3.2.3. For long periods of storage (greater than a few days/weeks), remove batteries.
 - 3.3. Conductivity meter--separate probe
 - 3.3.1. Calibrate instrument regularly as per GW-070.
 - 3.3.2. For long periods of storage (greater than a few days/weeks), remove batteries and disconnect probe.
 - 3.4. Conductivity meter--wand type
 - 3.4.1. Calibrate instrument regularly as per GW-070.
 - 3.4.2. When not in use, store meter with probe cap firmly in place.
 - 3.4.3. For long periods of storage (greater than a few days/weeks), remove batteries.
 - 3.5. Global Positioning System (GPS) unit
 - 3.5.1. Due to the value of these units, they will not be kept in the storage area. The GPS units will be retained by individual project personnel. Check with the Section Supervisor and/or GWMA staff to locate the units.
 - 3.6. Nitrate field test kit (Hach kit)
 - 3.6.1. Periodically ensure that test tubes are not cracked or chipped; if so, replace them.

- 3.6.2. Periodically check expiration date on reagent packets; if out of date, replace them.
- 3.6.3. For long periods of storage, store kit in dark, dry, cool place.
- 3.7. Triazine field test kit
 - 3.7.1. Periodically check expiration date on kit. If they are out of date but have been stored in refrigerator, they are still usable. Schedule the oldest kits for first field use.
 - 3.7.2. For opened kits, periodically check test tube pouch to ensure that it is sealed.
 - 3.7.3. For long periods of storage, store kit in refrigerator. Clearly mark each kit as belonging to the Groundwater Section.
 - 3.7.3.1. Conversation with the manufacturer indicates that the triazine test kits have an indefinite shelf life if they are kept refrigerated. Use your best judgement as to whether out-of-date test kits should be used on your project.
 - 3.7.3.2. Test kits may be stored in a refrigerator in the Bio Lab.
- 3.8. Miscellaneous equipment/materials
 - 3.8.1. Store miscellaneous equipment and materials in the Section's storage area at NDEE. Ensure that all equipment is clean and in working order, and that materials are properly secured with regard to light, moisture, temperature, etc.

APPENDIX A. Equipment/materials checklist for groundwater sampling

INSTRUMENTS

- _____ Thermometers, alcohol filled (2 min.)
- _____ pH meter (wand or probe)
- _____ Spare battery--9 volt alkaline or appropriate
- _____ Calibration standards
- _____ Conductivity meter
- _____ Spare batteries--(2) "D" cells, alkaline or appropriate
- _____ Calibration standard(s)
- _____ GPS unit
- _____ Spare batteries
- _____ Nitrate test kit (Hach)
- _____ Reagent pillows
- _____ Spare test tubes
- _____ Spare color wheel
- _____ Triazine test kit
- _____ Disposable pipettes

EQUIPMENT

- _____ Coolers (4 or more)
- _____ Squirt bottle
- _____ Wide-mouth glass jar, 500 ml min., w/ lid (conductivity)
- _____ Wide-mouth glass jar, 1 l min., w/ lid (ampule waste; from lab)
- _____ Filtering equipment
- _____ Flask
- _____ Filter holder/funnel
- _____ Vacuum pump w/ tubing
- _____ Filter tongs
- _____ Clipboard
- _____ Tools
- _____ Phillips screwdriver
- _____ Standard screwdriver
- _____ Pliers
- _____ Shovel
- _____ Buckets, 5-gallon (2)
- _____ Rubber boots
- _____ Garden hose
- _____ Deionized water container(s), 3-5 gallons each
- _____ Scissors
- _____ Bungee cords
- _____ Peristaltic pump
- _____ Tubing
- _____ Submersible pump

- _____ Generator
- _____ Fuel for generator

MATERIALS

- _____ Sample bottles, plastic w/ lids
- _____ Labels
- _____ Pesticide jars, brown glass, 1 l w/ lids & Teflon septa (from lab)
- _____ Deionized water to fill containers (from lab)
- _____ Pen(s)
- _____ Pencil(s)
- _____ Markers, Berol Prismacolor Art--Nile Green or comparable (2 min.)
- _____ Markers, Berol Prismacolor Art--Canary Yellow or comparable (2 min.)
- _____ Markers, Sharpie indelible or comparable (2 min. in various colors)
- _____ Sulfuric acid ampules, 2 ml conc.
- _____ Nitric acid ampules, 2 ml conc.
- _____ Filters, 0.45 um X 47 mm
- _____ Lab/chain-of-custody sheets
- _____ Field inventory sheets
- _____ Zip lock bags
- _____ Gloves, disposable
- _____ Rubber bands
- _____ Paper tags, manila/yellow/etc.
- _____ Labelling tape
- _____ Paper towels

INCIDENTALS

- _____ Maps
- _____ Well list(s)
- _____ QAPP copy
- _____ SOPs copy
- _____ Project contact list/phone #s
- _____ Travel authorization
- _____ Lodging authorization/direct bill
- _____ Field book
- _____ Camera
- _____ Binoculars
- _____ First aid kit
- _____ Cellular phone
- _____ List of hospitals for study area

MAILING

- _____ Strapping tape
- _____ Envelopes