

Nebraska Department of Water, Energy, and Environment

Standard Operating Procedure (SOP)

Groundwater Division - GW

SOP Number: GW-120

Title: Field Screening for Nitrate in Groundwater

Written Date: July 2025

Purpose: To achieve an accurate semi-quantitative field determination of nitrate-nitrogen levels in ground water samples for background and public information, and to use this determination as a decision aid in obtaining ground water samples for pesticide analysis.

Equipment/Materials Needed:

- Ground water sample in a clean unmarked 1 liter plastic container or wide-mouth glass jar as per SOP # GW-060
- Nitrate field screening kit, including nitrate reagent packets
- Squirt bottle filled with deionized water
- Stopwatch or wristwatch with second hand

Procedures:

1. Obtain a ground water sample in a clean unmarked 1 liter plastic container or wide-mouth glass jar as per SOP# GW-060.
2. Remove the two glass test tubes from the nitrate kit and rinse them thoroughly with sample water or deionized water.
3. Fill the two test tubes to the 5 ml (lower) indicator lines with sample water.
4. Place one test tube in the left opening of the comparator box.
5. Obtain a nitrate reagent packet; shake and tap the packet to loosen the reagent powder.
6. Open the packet and add the powder to the remaining test tube. Squeeze and shake the packet to be sure that all of the powder is removed from the packet. Dispose of the empty packet in an ordinary waste container.
7. Plug the test tube with a rubber stopper and shake the test tube vigorously for one minute, using a stopwatch or wristwatch with second hand to mark the time. An amber color will develop if nitrate is present.
8. Place the stoppered, prepared sample in the right opening of the comparator box and allow it to set undisturbed for one minute.
9. Hold the comparator up to a light source such as a window, the sky, or a lamp and look through the two openings in the front. Rotate the disc in the comparator until the colors in the two windows match.
10. Read the nitrate-nitrogen content (approximately in mg/l) through the scale window. This reading must be taken within 20 minutes of preparing the sample.
11. Record the reading on the field inventory sheet (NOTE: the scale window reads concentrations up to 50 mg/l. For concentrations higher than 50 mg/l, record the content as ">50 mg/l).
12. Dump out the test tubes and rinse them thoroughly with sample or deionized water.
13. Reassemble the test kit and secure it for transport to the next site.

(NOTE: For further information, refer to manufacturer's documentation provided with test kit.)