ADMINISTRATIVE MEMORANDUM

Miscellaneous Memo No. 14

TO: Water Management and Planning & Technical Services Divisions

From: Dave Tuthill and Hal Anderson

RE: Water Level Measurement Equipment Disinfection Procedure

Date: September 7, 2006

In an effort to ensure that no source water contamination occurs during the collection of water level measurement data, all IDWR employees engaged in measurement of water levels in wells will follow the guidance on equipment disinfection contained in USGS Handbook for Water Resources Investigations (Book 9, Chapter A3), copy attached to this memorandum.

Water Resources--Office of Water Quality

National Field Manual for the Collection of Water-Quality Data

Techniques of Water-Resources Investigations
Book 9
Handbooks for Water-Resources Investigations

Foreword

The mission of the Water Resources Discipline of the U.S. Geological Survey (USGS) is to provide the information and understanding needed for wise management of the Nation's water resources. Inherent in this mission is the responsibility to collect data that accurately describe the physical, chemical, and biological attributes of water systems. These data are used for environmental and resource assessments by the USGS, other government agenices and scientific organizations, and the general public. Reliable and quality-assured data are essential to the credibility and impartiality of the water-resources appraisals carried out by the USGS.

The development and use of a *National Field Manual* is necessary to achieve consistency in the scientific methods and procedures used, to document those methods and procedures, and to maintain technical expertise. USGS field personnel use this manual to ensure that the data collected are of the quality required to fulfill our mission.

(signed)

Robert M. Hirsch
Associate Director for Water

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Techniques of Water-Resources Investigations

Book 9
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National Field Manual for the Collection of Water-Quality Data

Chapter A3.

CLEANING OF EQUIPMENT FOR WATER SAMPLING

Revised 2004
Edited by Franceska D. Wilde

USGS
science for a changing world

When cleaning the flowthrough chamber:

1. Clean the flowthrough chamber in the workplace laboratory with detergent solution and rinse thoroughly with tap water, followed by DIW. **Do not use acid solution or methanol.**
2. If the flowthrough chamber needs to be field cleaned, remove measurement sensors and clean with a dilute detergent solution; rinse thoroughly with tap water followed by DIW. If using the flowthrough cell of a multiparameter instrument, follow the manufacturer's instructions for cleaning the cell

3.3.7 RADON SAMPLER

To clean radon samplers:

1. Soak radon samplers in a detergent solution for 10 minutes.
2. Rinse thoroughly with tap water to remove detergent residue, followed by three to five rinses with DIW.
3. Air dry the radon sampler and store in doubled plastic bags. **Do not use methanol on radon sampling equipment.**

3.3.8 WELL TAPES

Always inspect and clean well tapes after each use. Procedure 1 below describes general cleaning instructions for electric and steel tapes that are used to measure water levels in monitor or observation wells that do not have fecal contamination. Procedure 2 below describes disinfection instructions for well tapes that are used to measure water levels in wells susceptible to fecal contamination, including public-supply and domestic wells.

- Before using these procedures, check with the well owner or wellfield project manager to determine whether site restrictions would be compromised by the use of any of the cleaning substances described.
- Check the instructions provided by the manufacturer before using a cleaning or disinfection agent on your electric tape other than laboratory detergent and water
- The term "electric tape" is used here to include the sensor and other wetted parts of electronic instruments that are used to measure water levels in wells
- Spread clean plastic sheeting on the surface over which the tape will be cleaned, to prevent the tape from contacting the ground or other potential sources of contamination.

PROCEDURE 1. This cleaning procedure contains two options for cleaning well tapes used in monitor or observation wells **that are not susceptible to fecal contamination**, and therefore do not require disinfection. Option A is the standard procedure for cleaning well tapes when no oily substance is present on the water table. Option B describes how to clean oil residues from the well tape. Inspect the well tape before starting the cleaning procedure to determine whether Option A or Option B should be used

Option A: Cleaning an electric or steel tape where no oily residue is noticeable on the tape:

When using an electric tape and sensor equipment, follow the manufacturer's instructions for equipment care and cleaning. Steps 1 through 3 can be used in the absence of manufacturer's instructions.

1. Wash the tape with a nonphosphate, 0.1- to 2-percent laboratory detergent solution (for example, Liqui-Nox[8]), using a soft cloth or a soft brush
2. Rinse the tape thoroughly with DIW or tap water to remove all traces of the detergent solution

[8]Liqui-Nox and Detergent 8 are products of Alconox, Inc. Reference to these products is for descriptive purposes only and does not imply endorsement by the U.S. Geological Survey.

3. Dry the electric or steel tape with a clean, soft cloth, and rewind the tape onto the reel. Place the tape into a clean plastic bag for transport and storage.
   Recommendation: If the tape will be stored for a month or more, put a drying agent such as a silica-gel packet into the plastic bag before sealing the bag.

Option B: Cleaning an electric or steel tape that is coated with oil:

When cleaning an electric tape, check with the manufacturer before exposing the tape to a solvent. This procedure should be carried out away from the well site.

1. Wearing solvent-resistant disposable gloves, prepare a nonphosphate, laboratory detergent solution (for example, 10-percent Liqui-Nox or 3-percent Detergent 8).
2. Use a soft brush, a clean terry cloth, or a sponge that is saturated with the detergent solution to remove oil from the wetted portion of the tape.
3. If an oily residue persists, use a clean cloth wetted with a solvent (such as a 10-percent naptha solution or a 70-percent ethanol, methanol, or acetone solution) and wipe down the oily portions of the tape. Allow the tape to air dry in a well-ventilated area.
4. Using tap water or DIW, thoroughly rinse the detergent from the tape, and then dry the tape with a clean cloth.
5. Rewind the tape onto the reel and place it into a clean plastic bag for storage and transport.
   Recommendation: If the tape will be stored for a month or more, put a drying agent such as a silica-gel packet into the plastic bag before sealing the bag.

Caution: Solvents mentioned above are flammable, explosive, and produce noxious fumes. Store these solvents in appropriate solvent-resistant containers that can be tightly capped and that are clearly labeled with its contents and hazards. A Material Safety Data Sheet (MSDS) must be displayed in the vicinity where the solvent is stored. Always wear disposable, solvent-resistant (for example, nitrile) gloves when working with solvents or other chemical substances. Do not leave the solvent in the sun or in a hot vehicle.

PROCEDURE 2. A well tape should be disinfected when it is being used to measure water levels in public-supply or domestic wells, or in wells susceptible to fecal contamination from other human or animal operations. **Begin Procedure 2 with a well tape that has been cleaned with a detergent solution, as described above in Procedure 1.**

Disinfecting an electric or steel tape:

1. Select a disinfectant: either a chlorine bleach solution (described below) or a methyl or ethyl alcohol solution. If using bleach, prepare a dilute 50 mg/L (0.005 percent) solution of common household chlorine bleach (1 mL of bleach to 900 mL water[9]). **If using an electric tape, check with the manufacturer before exposing the tape and related equipment to a solvent.**
   a. Label a polyethylene sample bottle as "Well-Tape Disinfectant" and record the date of preparation, using an indelible marker. The bleach solution should be prepared fresh for each day of use (NFM 7.3)
   b. Fill the bottle with the dilute disinfectant solution. Cap the bottle tightly, and double-bag it in a ziplock plastic bag for transport.
2. At the well site, put on disposable gloves. Wet a clean cloth with the disinfectant solution and use it to wipe down the section of the tape that was submerged in the well water.
3. Rinse the tape thoroughly with DIW or tap water. Using another clean cloth, wet and wipe the surface of the well tape through the entire chalked and wetted sections of the tape. Be thorough when rinsing bleach solution from a well tape; prolonged exposure of the tape to chlorine bleach can damage the tape.
4. Using a clean dry cloth, dry the steel tape thoroughly to prevent it from rusting.
5. Rewind the tape onto the reel and place it into a clean plastic bag for storage and transport.
   Recommendation: If the tape will be stored for a month or more, put a drying agent such as a silica-gel packet into the plastic bag before sealing the bag.

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[9]Prepare a 0.02 percent (200 mg/L) solution if pH is less than 6 or greater than 8 (NFM 7.3)