

State of Nebraska Well Drillers Licensing Exam

Nebraska Well Drillers Association



Study Guides

- Ground Water and Wells
- Nebraska Water Well Standards
- Groundwater Atlas of Nebraska
- Practical Handbook of Groundwater Monitoring



Water Well & Monitoring Technician

- They may break a seal on a well to perform sampling or measure water levels.
- They can record an accurate well log of each water well and test hole during each sampling event.
- Install sampling equipment at each sampling event.
- They may inspect monitoring equipment.



PPE

- Personal Protective Equipment
- 4 - levels
- OSHA standards
- CFR-1910.120
- Hazardous Materials
- Employees Protection



Level A

- Positive pressure, full face self-contained breathing apparatus (SCBA)
- Encapsulating chemical protective suit(moonsuit)
- Coveralls
- Gloves-outer and inner chemical resistant
- Boots- chemical resistant-steel toe
- Hard Hat-(under suit)



Level B

- Positive pressure, full face self-contained breathing apparatus (SCBA)
- Coveralls
- Gloves-outer and inner chemical resistant
- Boots- chemical resistant-steel toe
- Hard Hat-(under suit)



Level C

- Concentrations, type of airborne substances
- Full face or half mask air purifying respirators-
- Hooded chemical resistant clothing
- Coveralls –gloves
- Eye protection-glasses or face shield



Level D

- Minimal Protection-nuisance contamination
- Coveralls
- Gloves
- Boots-chemical resistant-steel toe and shank
- Safety glasses- chemical slash goggles
- Hard hat



PPE and Safety Need to Knows

- Respirator cartridge should be used **consistent with site specific conditions.**
- The major component of site safety is completing a **site safety plan.**
- **Heat Stress** is a huge concern when dealing with Level A and Level B PPE.
- The key to safety in the field is the ability to **recognize hazards.**



Confined Space Entry

- Confined space entry rules require **pre-entry checklist**.
- Confined space deaths can occur to rescuers.
- Confined spaces be occupied when they are **ventilated**.



Pump Information

- Suction pumps in Nebraska can lift water is between **28-32** feet.
- The pump intake during purging should be placed at the **top of the well screen**.
- A pump suitable to obtain groundwater samples suspected of being contaminated with volatile organic chemicals is a **submersible**.
- **1** well can be sampled with a dedicated pump.



Sampling & Purging

- The primary objective of all monitoring programs is obtaining **representative samples**.
- Water levels should be measured from a **known elevation or point**.
- Air monitoring important because it is an **essential part of a safety plan**.
- The proper amount of purging is in **accordance with the sampling plan**.
- Monitoring well purging should continue until **pH and conductivity are stabilized**.



Sampling & Purging Cont.

- Before taking groundwater samples, purging the well is necessary to remove **stagnant water from the well casing.**
- The appropriate monitoring well diameter is dependent **upon site-specific factors.**
- The water level should be measured in a well exhibiting head pressure **when it is determined that it has equilibrated.**
- Well screens constructed for LUST investigations should **extend above and below the water table.**



General Information

- **84%** of the State of Nebraska is underlain by the High Plains Aquifer.
- Ground water flows at **right angles to ground water elevation contours**.
- The typical rate of ground water movement under natural conditions **is slow, often inches or feet per day**.
- Contour line on a topographic map show **elevation**.



General Info Cont.

- **50%** of the U.S. population relies on ground water for drinking.
- A benchmark denoted on a USGS topographic map indicates a **known geodesic datum point**.
- Gravel pack design is difficult because of a **need to match a wide variety of particle sizes**.



Know the Regulations

- Questions regarding the enforcement of laws, rules, and regulations pertaining to the construction of monitoring wells should be directed to DWEE.
- Monitoring wells used to sample ground water should always be installed to protect the well from surface pollution.
- Vandal-resistant secured metal caps should be used on monitoring wells.



Know the Regulations Contaminate Levels & Info

- The maximum contaminant level for nitrate-nitrogen is **10 mg/l**.
- The maximum contaminant level for trichloroethylene (TCE) is **5 ug/l**.
- What atmosphere is considered oxygen deficient at **19.50%**.
- A contaminant with a specific gravity of 0.85 will **float on the water table**.



Know the Regulations Contaminate Levels & Info

- The typical preservative for a ground water sample to be analyzed for nitrate-nitrogen is **Sulfuric acid**.
- Field blanks are used to make sure **contaminants are not introduced during field work**.
- Water sources used for human consumption should, at a minimum, be tested for **coliform bacteria**.



Definitions & Meanings

- Aquifer
- Permeability
- Drawdown
- Well Seal
- Potentiometric surface
- Confined Aquifer
- MSDS/SDS
- Hydraulic Conductivity
- Porosity
- Static Water Table
- Annular space
- Aliquot
- Acidic water
- Specific Yield
- Head Space



SAFETY OF THE CREW IS THE FIRST CONCERN IN WELL DRILLING



Questions?

