BOSQUE ECOSYSTEM MONITORING PROGRAM

Groundwater Quality Monitoring Directions

Groundwater Quality Monitoring Background

All five wells are sampled for depth to water, temperature (water and air), pH, conductivity, turbidity, dissolved oxygen (DO), chloride, ammonium, nitrate, phosphate, bromide, and sulfate. At select sites, the nearby ditch/drain and/or the river at the bank are also sampled for the same parameters.

This information is collected and made available for use in models (specifically Upper Rio Grande Water Operations Model [URGWOM] maintained by the US Army Corps of Engineers), habitat queries (specifically silvery minnow habitat by the US Fish and Wildlife Service), etc. for resource managers, other interested organizations, educators, individual citizens and policy makers. Also, this is quality-controlled data with which students can compare their field measurements of water quality.

Groundwater Quality Monitoring Materials

- folding table
- 1 medium cooler for equipment
- conductivity meter
- turbidimeter
- barometer
- site maps
- data sheet, clipboard and pen
- pH meter
- beeper
- sharpie
- Geopump and battery
- several centrifuge tubes
- extra battery for Geopump
- a number of microfiber filters in a Ziplock bag
- tubing (1 bag per setup)
- 60 mL syringe without needle
- 1 large plastic beaker
- Ziplock bag for used filters
- pickle bucket with 1 to 5 gallons marked off
- small cooler with frozen blue ice or regular ice – for samples in tubes
- DO meter
- bailer
- kestrel
- camping seat
- camera
- backpack
- extra battery
- extra batteries for meters
- instruction manuals for meters
- data sheet indicating where obtain samples at river and ditch
- site maps

Before going to the field, turn on DO meter and test meter to ensure it is calibrated, the membrane is not dried out and the sponge at the end of the calibration chamber is moist. The meter, while probe is in its calibration chamber, should read about 80%. Take readings with and calibrate pH meter if necessary. Test conductivity meter and calibrate if necessary Once a month, obtain the 0-10, 0-100 and 0-1000 measurements for turbidimeter. Once a month, change out pH buffer solutions and conductivity solution.

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At each well, note the date, site, well, time and names of data collectors (see data sheet). Beep the well and measure total well depth. Calculate the difference between the beep and total well depth and use the spreadsheet in the back of the data sheets to determine amount of water to be purged.

Insert tubing into well until it hits the bottom and then pull it up from the bottom about 15 cm. Thread tubing through Geopump and put other end of tubing into large beaker.

Start Geopump. Keep all instruments in the shade, as well as the beaker that the water is flowing through for measuring DO if at all possible. Place DO, conductivity and pH sensors into the beaker.

After reaching either amount to be purged or three gallons, take a DO reading in mg/L as well as % and record these and temperature. Record pH and conductivity data and temperatures.

Rinse the small glass vial of the turbidimeter with fresh

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groundwater three times and then fill it to the fill line. Do not put your hand into the beaker of water to obtain a water sample for turbidity because you introduce salts or other contaminants from your hand into the water – this will impact the analyses. Wipe glass with cotton cloth to remove fingerprints and any water that may be on it. Obtain a reading and record data. Take air temperature reading in the shade.

Label centrifuge tube with site name, well, date, time and your initials. Be consistent with the labeling of sites (Montaño vs. Mon) while at a site and discuss the designated label if there's another person at the site. Using the syringe, suck water from the beaker. Attach filter to syringe and push syringe to empty filtered water into tube. Minimum amount of sample to be obtained is ¼ of the tube. If more than one filter is needed to obtain sample, use another filter.
Check to make sure that the tube is tightly closed by turning it up and down and around.

When back at car, place tubes of water in cooler.

At end of the day, take samples to UNM and refrigerate or refrigerate. Charge batteries overnight. Throw away dirty filers and put clean ones in for the next day. Put new centrifuge tubes in for the next day and new batteries for Geopump.

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Site:		Date:		Data Collectors:		
Time:				Barometric Pressure:		
Well:	W = depth to water (cm):			T = total well depth (cm):		T-W (cm):
Gallons purged	Air temp (C)	Turbidity (NTU)	DO (mg/L)	DO (% sat)	Conductivity (uS/cm)	pH
Obtain a water sample? Correct label on vial for sample?			Temp (C)		Temp (C)	Temp (C)

Site:		Date:		Data Collectors:		
Time:				Barometric Pressure:		
Well:	W = depth to water (cm):			T = total well depth (cm):		T-W (cm):
Gallons purged	Air temp (C)	Turbidity (NTU)	DO (mg/L)	DO (% sat)	Conductivity (uS/cm)	pH
Obtain a water sample? Correct label on vial for sample?			Temp (C)		Temp (C)	Temp (C)

Site:		Date:		Data Collectors:		
Time:				Barometric Pressure:		
Well:	W = depth to water (cm):			T = total well depth (cm):		T-W (cm):
Gallons purged	Air temp (C)	Turbidity (NTU)	DO (mg/L)	DO (% sat)	Conductivity (uS/cm)	pH
Obtain a water sample? Correct label on vial for sample?			Temp (C)		Temp (C)	Temp (C)

Site:		Date:		Data Collectors:		
Time:				Barometric Pressure:		
Well:	W = depth to water (cm):			T = total well depth (cm):		T-W (cm):
Gallons purged	Air temp (C)	Turbidity (NTU)	DO (mg/L)	DO (% sat)	Conductivity (uS/cm)	pH
Obtain a water sample? Correct label on vial for sample?			Temp (C)		Temp (C)	Temp (C)