Water Beyond 2000
Upground Reservoir Project

Interpreting Water Sample Results from the
Well Assessment Analysis Report

Each water sample collected as part of the well assessment was sent to a laboratory and several tests were performed. The results of those tests can be found by reading the information from the columns in the report you were provided that are entitled "Analyses", "Result" and "Units".

The following information and the attached example is provided to assist residents in interpreting the laboratory results for the water sample taken from your well.

Total Coliform- are naturally occurring bacteria in the environment that are used as an indicator that other potentially harmful bacteria may be present. If total coliform bacteria are present, the sample result will be "Positive". If a sample was positive for total coliform, an E-coli test was also performed. "Negative" means total coliform bacteria were not present in the sample and it was not necessary to test for E-coli.

E-coli- are bacteria whose presence indicates that the water may be contaminated with animal wastes or human wastes from on-site sewage disposal systems. If E-coli bacteria are present, the sample result will be "Positive". "Negative" means E-coli bacteria were not present in the sample.

If sample results were "Positive" indicating either total coliform or both total coliform and E-coli bacteria are present from your drinking water well, it is recommended you contact your local County Health Department to obtain additional information regarding ways to address potential bacteriological concerns.

Arsenic- is a naturally occurring chemical, and is also used as a wood preservative and in paints and dyes. These industrial and some agricultural applications can also contribute to arsenic releases in the environment. Arsenic-related pollutants enter the groundwater system by gradually moving with the flow of ground water from rain, melting snow, etc.

Arsenic in drinking water is measured in either micrograms per liter (ug/L) or parts per billion (ppb). The U.S. EPA does not regulate private water wells, but its drinking water rules provide a good standard by which to measure your water quality. The U.S. EPA-established maximum level for arsenic in drinking water was changed in November 2001 from 50 ug/L to 10 ug/L.

If sample results indicate arsenic levels are in excess of 10 ug/L, it is recommended you contact your local County Health Department to obtain additional information regarding arsenic in groundwater.

Hardness- is the most common water quality concern due to the groundwater being in contact with minerals in the soils and bedrock, predominantly calcium and magnesium. Hardness is measured in milligrams per liter (mg/L) or parts per million (ppm). As these minerals dissolve into the water, the hardness levels increase. Water hardness levels in excess of 120 mg/L can "consume" soap, which makes washing clothes or anything else difficult. Dissolved minerals can also precipitate out of the water, forming a white or gray scale on the surface of pipes, water heaters, boilers, sinks, etc.

Water softeners usually remove the calcium and magnesium minerals from the water by replacing it with sodium.

(Continued on back)

Iron & Manganese- Iron in rural groundwater supplies is also a common concern. When dissolved iron present in groundwater at concentrations in excess of 300 ug/L comes into contact with oxygen in the air, rust colored deposits form**.** Similarly, when manganese is in the groundwater at levels above 50 ug/L and is oxidized, a blackish precipitate is formed. These deposits stain plumbing fixtures, discolor laundry and can have an unpleasant taste that is apparent in drinking and food preparation. Over time, deposits from iron-laden groundwater can accumulate and create blockages in screens, pumps, pipes, and pressure tanks.

Water softener salt with special iron removal additives, filtration units, or other water treatment systems are common ways to remove iron and manganese from groundwater.

Sulfur- Two forms of sulfur are commonly found in drinking water: sulfate and hydrogen sulfide. Sulfate is a combination of sulfur, a naturally occurring mineral in some soil and rock, and oxygen. The mineral dissolves over time and is released into ground water. No laboratory tests were performed for sulfates as part of the water well assessment.

Hydrogen sulfide is produced when sulfur-reducing bacteria present in ground water uses sulfur to chemically change sulfates to hydrogen sulfide. The bacteria uses sulfur from decaying plants, rocks, or soil. Hydrogen sulfide can also exist naturally in ground water. The field staff conducting the tests and preparing the Well Assessment Analysis Report, which listed information about your well, may have noted if groundwater from your well or from the tap was giving off the distinctive “rotten egg” smell indicating the presence of hydrogen sulfide.

Hydrogen sulfide is certainly an inconvenience to one's nose, as it is noticeable at low concentrations when first turning the faucet at the sink or the shower. Hydrogen sulfide can be corrosive to metals such as iron, steel, copper, and brass, and it can cause yellow or black stains on kitchen and bathroom fixtures. It can discolor and alter the taste of beverages and food prepared with water containing hydrogen sulfide.

The various methods to remove hydrogen sulfide from groundwater include activated carbon filtration, shock chlorination, oxidizing chemical injection, and oxidizing filtration. The treatment technology should be chosen based on the level of hydrogen sulfide, the amount of water being treated, the levels of iron and manganese, and bacterial contamination.

City of Columbus
Michael B. Coleman, Mayor

Contact Information:
City of Columbus, Department of Public Utilities
910 Dublin Road
Columbus, Ohio 43215
www.columbusupgroundreservoirs.com

Please submit your comments on the project at:
upgroundrescomments@columbus.gov

EXAMPLE OF LABORATORY RESULTS FROM WELL ASSESSMENTS

Belmont Labs **Date:** *08-Oct-07*

CLIENT: MS Consultants **Lab Order:** 0709E39
Project: 61-04780-00-J1-13-0304

Lab ID: 0709E39-006 **Collection Date:** 9/27/2007 3:00:00 PM
Client Sample ID: 4373 St Rt 257 **Matrix:** DRINKING WATER

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOTAL COLIFORM BY P/A		**M9223B**				Analyst: **BR**
E.coli	Negative		H	Positive/Negative	1	10/1/2007 12:02:00 PM
Total Coliform	Negative		H	Positive/Negative	1	10/1/2007 12:02:00 PM
ARSENIC, TOTAL		**M3113 B**				Analyst: **KC**
Arsenic	BDL	3.0		µg/L	1	10/5/2007
HARDNESS, TOTAL		**M2340 B**				Analyst: **RJE**
Hardness, Total	357	1.00		mg/L	1	10/5/2007 10:39:27 PM
ICP METALS, POTABLE		**E200.7**				Analyst: **RJE**
Iron	336	50.0	*	µg/L	1	10/5/2007 10:39:27 PM
Manganese	14.9	5.00		µg/L	1	10/5/2007 10:39:27 PM

Data Qualifiers (Flags)

!	See Case Narrative
*	Value exceeds Maximum Contaminant Level
A	Silica gel analysis not performed because the total oil and grease is less than detectable limits
B	Analyte detected in the associated Method Blank
BDL	Below Detection limit
C	Sample result confirmed by reanalysis
E	Value above quantitation range
F	Unable to obtain a reliable result due to matrix interference
H	Analysis completed outside holding times
J	Analyte detected below quantitation limits, estimated concentration for TICs
K	Result from method of standard additions
N	Presumptive evidence of analyte present
NG	No growth
P	Sample preservation does not meet method requirements
PQL	Practical Quantitation Limit or surrogate
S	Surrogate recovery outside acceptance limits
V	Calibration criteria exceeded, but acceptable by method