Assured Bio Labs, LLC

Environmental Microbiology Lab

Tennessee Division of Water Resources Lab ID: 03147

228 Midway Ln, Ste B

Oak Ridge, TN 37830

REVIEWED

By Deni Scar Sobek at 1:39 pm, Nov 27, 2024

assuredbio™

ADVANCED WATER PANEL

Inspector:	Joe Hester	Date Collected:	11/20/2024
Project Name:	[redacted]	Date Received:	11/21/2024
Project Number:	20241120b	Date Reported:	11/27/2024
Assured Bio ID:	JH112124-42	Analyst(s):	D. Christopher, J. Wilder

Reference Table: a reference to the maximum containment levels set forth by the EPA.
Table is not a representation of your samples, but a guide to assist in the interpretation of your results. Consult your local and state regulations for more details.

Analyte Range of Detection	MCL*	Description
Arsenic 0 – 0.5 ppm	0.01 ppm	A toxic element, sources include natural deposits, industrial and agricultural pollution. Long-term exposure can cause cancer, skin lesions, and developmental effects.
Chloride 1 – 1000 ppm	<250 ppm	Associated with industrial pollution and natural mineral deposits. High levels lead to a salty taste and can contribute to high blood pressure.
Coliform *E. coli* ≥1 cfu/100 ml	0 cfu/100 ml	†The presence of coliform bacteria, including *E. coli*, indicates your well water may be contaminated by livestock or human waste runoff, fertilizer, a leak in your septic system, and more. *E. coli* bacteria can result in recurring gastro-intestinal illness, with symptoms such as stomach cramping and diarrhea.
Color 5 – 500 color units	15 color units	Associated with and may affect the presence of other contaminants; monitoring pH levels over time is a good way to determine if conditions impacting drinking water have changed.
Conductivity 0 – 1999 µS/cm	nps	High levels indicate the presence of dissolved salts and pollutants; found in natural deposits, industrial pollution, agricultural runoff.
total Copper 0.1 – 8.0 ppm	1.3 ppm primary 1.0 ppm secondary	Can be found due to corrosion of household plumbing systems, natural deposits, industrial discharge; exposure can cause gastrointestinal distress, liver or kidney damage.
total Hardness 20 – 350 ppm	nps	A measure of the concentration of calcium and magnesium; not a health risk but can cause scale buildup in plumbing and reduce effectiveness of soap.
total Iron 0.2 – 6.0 ppm	0.3 ppm	High concentrations cause staining and an unpleasant taste; sources include natural deposits and corrosion of iron pipes.

Analyte Range of Detection	MCL*	Description
Lead 0.003 – 0.300 ppm	0 ppm 0.015 ppm	Household plumbing and service lines made from lead or lead solder can leach lead into drinking water. Lead is toxic, a carcinogen, in fetuses and children can cause developmental and cognitive problems and accumulates in the body over time.
Magnesium 0.5 – 50 ppm	nps	Beneficial in small amounts and generally not harmful; part of total hardness; found naturally.
Manganese 0.006 – 0.700 ppm	0.05 ppm	High levels can cause neurological issues and staining of plumbing; naturally occurring, but also leaches from pipes and from industrial discharge.
Nitrate 0.23 – 13.5 ppm	10 ppm	Associated with livestock/human waste and agricultural runoff. Increased nitrates and/or nitrites are particularly harmful for children under three. Blue baby syndrome is associated with drinking water high in nitrites.
Nitrite 0.015 –0.06 ppm	1 ppm	
pH 1.0 – 14.0	6.5-8.5	Associated with and may affect the presence of other contaminants; monitoring pH levels over time is a good way to determine if conditions impacting drinking water have changed.
total Phosphate 0.15 – 4.5 ppm	0.05 ppm	Often found in fertilizers and detergents, presence can indicate agricultural runoff and wastewater (septic) discharge.
Potassium 0.1 – 700 ppm	nps	Very high levels can affect individuals with kidney problems; found in natural deposits, agricultural runoff, fertilizer.
Sulfate 40 – 150 ppm	250 ppm	A naturally occurring element in minerals, soil and rocks, agriculture runoff, industrial discharges; high levels can cause a laxative effect and unpleasant taste.
Total Suspended Solids 2.5 – 200 ppm	nps	Measures particles suspended in the water including silt, plankton, waste, minerals; can cause water turbidity and effects water aesthetics.

Abbreviations

µS/cm	Microsiemens per centimeter	ml	milliliter
AL	Action Level	n/a	not applicable
BDL	Below Detectable Limits	nps	no published standard
cfu	colony forming unit	ppm	part per million (mg/l)
color unit	1 color unit = 1 PtCo unit	PtCo	Platinum-Cobalt
MCL	Maximum Contaminant Level		

*Maximum Contaminant Levels are the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur set by the Environmental Protection Agency (EPA).

†For positive bacteria results we recommend referring to the Tennessee Healthy Well Manual for well shocking instructions.

**An action level is the concentration of a contaminant, set by the EPA, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Sample Results

Assured Bio Identifier	JH112124-42-1
Sample ID	W1
Sample Description	Advanced Well Panel/Well Head
Sample Condition	Intact
Sample Type	Water

Analyte	Results	Unit
Bacteria		
Coliform	BDL	P/A
E. coli	BDL	P/A
Property		
Color	BDL	PtCo
Conductivity	138	µS/cm
Hardness	48.4	ppm
pH	6.54	
Total Suspended Solids	1.6	ppm
Inorganic		
Chloride	BDL	ppm
Nitrate	0.934	ppm
Nitrite	BDL	ppm
Total Phosphate	BDL	ppm
Sulfate	BDL	ppm
Metal		
Arsenic	BDL	ppm
Total Copper	0.601	ppm
Total Iron	2.57	ppm
Lead	BDL	ppm
Magnesium	4.56	ppm
Manganese	0.016	ppm
Potassium	2.6	ppm

Selected References

- EPA Manual of the Certification of Laboratories Analyzing Drinking Water, 5th Edition. EPA 815-R-05-004, January 2005.
- IDEXX SimPlate® for HPC Unit Dose Instructions. 06-03208-10, 2016.
- Environmental Protection Agency. 2005. EPA Manual for the Certification of Laboratories Analyzing Drinking Water. Criteria and Procedures Quality Assurance. Fifth Edition. Cincinnati, Ohio

Methods of Analysis

Assured Bio Labs, LLC uses the following Standard Operating Procedures for the analysis of samples:

CD 205: Coliform Presence Absence Test According to the EPA Manual for the Certification of Laboratories Analyzing Drinking Water, CD 219: Hach Water Testing (DR 3900) Using TNT, Powder Pillow, or Other Photospectroscopic Methods.
CD 224 Heterotrophic Plate Count Using the SimPlate® Method.

Reporting Limits

Method Detection Limit: The American Industrial Hygiene Association defines this term in AIHA LAP, LLC Policy Document – Module 9 as "The minimum concentration of an analyte that, in a given matrix and with a specific method, has a 99 percent probability of being identified, qualitatively or quantitatively measured, and reported to be greater than zero."

Reporting Limit: The American Industrial Hygiene Association defines this term in AIHA LAP, LLC

Policy Document – Module 9 as "The lowest concentration of analyte in a sample that can be reported with a defined, reproducible level of certainty."

Range of Detection: The reporting limit to the maximum reporting limit giving the currently used testing methodology at Assured Bio labs LLC. Any amount reported outside of this range should be considered an estimate. Values outside of this range may be reported as greater than (">") or less than ("<").

Additional Comments

The analytical data included in this report reflect only the conditions of the material sampled and submitted to the laboratory for analysis at the time of collection. We can make no claims to the safety or potability of water. The results included in this report may not be used for past or future environmental conditions. The results apply to the sample(s) as received. Potential interferences may exist for certain tests. When such interferences are detected, they will be report when potentially affecting the result and the Maximum Contaminant Level. A list of methods used can be provided upon request. If you require a certain method, please contact us for further guidance.

The results are reported as the Most Probable Number per milliliter (MPN/ml) with the upper and lower 95% confidence limits profided per sample. These values are derived from the IDEXX SimPlate® Most Probable Number Table. Samples with less than one positive well are reported as below detectable limits with a 95% confidence interval of <0.03-<1.4 MPN/ml.

Limitations