

Report Date: 9/29/2020

CERTIFICATE OF ANALYSIS

Analysis Number: 2009331

Sharp Water Culligan - Shrewsbury, PA
8290 Miller Park Drive
umbarger@culliganma.com

Customer: AJ Billings Co.
4148 U Way
Havre De Grace MD, 21078

Control Number:

Account Number: 10004934
Collected By: Jody Oliver

Misc:
cc:

SAMPLE INFORMATION:

Analysis Type Requested: Silver/Realtor Well Test

Sampled: 9/23/2020 at 12:00 PM	Supply/Source: Private Well	Condition: Treated Water
Received: 9/25/2020 at 10:51 AM	Sampling Point: Faucet	Application: Household

This Certificate of Analysis compares the actual test result to national standards as defined in the EPA's Primary and Secondary Drinking Water Regulations.

Primary Standards: Are expressed as the maximum contaminant level (MCL) which is the highest level of contaminant that is allowed in drinking water. MCLs are enforceable standards.

Secondary Standards: Are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. Some states may choose to adopt that as enforceable standards.

mg/L (ppm): Unless otherwise indicated, results and standards are expressed as an amount in milligrams per liter or parts per million.

ug/L (ppb): Unless otherwise indicated, results and standards are expressed as an amount in micrograms per liter or parts per billion.

CFU/ml: colony-forming units per milliliter

Reporting Detection Level (RDL): The lowest concentration level that the laboratory can detect a contaminant.

ND: The contaminant was not detected above the minimum detection level.

NA: The contaminant was not analyzed.

* - non-TNI accredited parameter

** - IL-IDPH accredited parameter

Status









The contaminant was not detected in the sample above the minimum detection level.



The contaminant was detected below National Standard limit.



The contaminant was detected above National Standard limit.

Status	Contaminant	Results	RDL	Units	Method	EPA Limit	Analysis Date/Time	Qual
	Total Arsenic	<1.000	1.000	ug/L	200.8 R5.4	10.00	9/28/2020 at 9:23	
	Lead (Pb)	<1.000	1.000	ug/L	200.8 R5.4	15.00	9/28/2020 at 9:23	
	Nitrate as N	<0.200	0.200	mg/L	300.0 R2.1	10.00	9/29/2020 at 7:36	
	Nitrite as N	<0.100	0.100	mg/L	300.0 R2.1	1.00	9/29/2020 at 7:36	
	E. Coli**	No Micro			SM9223B Coli-18		9/25/2020 at 14:46	
	Total Coliform**	No Micro			SM9223B Coli-18		9/25/2020 at 14:46	

This report can only be reproduced in its entirety. The results reported here are representative of the sample as received in the laboratory. Unless noted holding times and temperature requirements for method 300 are not followed. pH results are out of hold time.

This analysis will not determine whether a water is safe for human consumption.

ANALYTE QUALIFIERS

- H1 Analysis conducted outside the EPA method holding time
- H2 Sample received outside EPA method temperature requirements
- P Sample received outside the EPA method preservative requirement
- C Sample received in an inappropriate sample container
- T Insufficient sample received from client to perform the analysis per EPA method requirements
- B Analyte was detected in an associated blank at a concentration greater than the MDL
- M Microbiological analysis initiated more than 80 hours after sample collection. Analysis was completed upon client approval
- SH The sampler's name and signature were not listed on the COC
- SF Sample collection dates and times were not listed on the COC
- A The sample was analyzed by serial dilution
- D The precision between the sample and sample duplicate exceeded laboratory control limits
- I This analyte exceeded secondary source verification criteria low/high for the initial calibration. This reported result should be considered an estimated value.
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value
- FS The sample was filtered in the laboratory prior to analysis
- R Results confirmed by second analysis
- SC This report contains data that were produced by subcontracted laboratory certified for the fields of testing performed
- DM Non-method digestion process is followed
- MM Method modification- not from the acidified well mixed sample

NELAP Certifications: IL-100213; PA-68-04623; NY-11756; TX-TX269-2007A
 State Certifications: IL-IDPH-17598; CA-2958; MT-CERT0091; IA-369;
 VT-02199; WI-105-10119; CO-IL100213; MI-9988; MO-1060

Maria Mozden
 Analytical Lab Manager



pH – stands for “potential of hydrogen” and indicates the acidity or alkalinity level of water on a scale of 0 to 14 (neutral = pH 7.0). Levels below 7.0 are acidic and above 7.0 are alkaline. pH is logarithmic – 6.0 is 10 X more acidic and 5.0 is 100 X more acidic than 7.0.

Conductivity - the ability of water to conduct electrical current, used to estimate the total concentration of dissolved mineral ions.

TDS - Total Dissolved Solids – the total amount of minerals dissolved in the water as determined by the conductivity level.

Turbidity - cloudiness in water caused by the dispersion of light by extremely tiny particles. Measured on an arbitrary scale of Nephelometric Turbidity Units (NTUs). **Turbidity after filtration** is measured after passing water through and 11-micron filter paper.

Color - the amount of color in the water. Color can be caused by organic matter or oxidized metals and their combinations.

Color after Acidification - Acid added to the sample dissolves oxidized metals and the result after acidification is due to organics.

Hardness – The sum of calcium and magnesium ions and any metals. Calcium and magnesium are the cause of “hard water”.

Sodium – is naturally occurring. Sources can be sea water, underground deposits or the result of road salting in colder climates.

Iron – elemental metal responsible for orange, rust stains on laundry and fixtures and a metallic smell to water.

Manganese – elemental metal responsible for brown and black stains. Very soluble and often found in combination with iron.

Copper - causes blue/green staining in sinks and showers. Usually from copper pipe corrosion due to low pH and/or high TDS.

Zinc – may cause metallic taste and upset stomach, usually due to corrosion of galvanized plumbing materials.

Chloride – often found where sodium is present and is responsible for the “salty” taste associated with salt (sodium chloride).

Nitrate – sources of nitrate are human/animal wastes and fertilizers. Water supplies with high levels should also be tested for bacterial contamination and pesticides if in an agricultural area. Nitrate can be toxic to infants if ingested by causing “blue baby syndrome”.

Nitrite – may be present where nitrate is found and is more toxic at lower levels than nitrate.

Sulfate – a naturally occurring mineral in groundwater. At high levels it can cause a bitter taste and have a laxative effect.

Fluoride - often added to municipal water to inhibit tooth decay. Can also be present in well water at excessive levels.

Total Alkalinity - the sum of hydroxide (OH⁻), carbonate (CO₃⁻²), and bicarbonate (HCO₃⁻) ions which buffer changes in pH level.

Bicarbonate – present in water from pH level 4.7 up to a pH level 8.3 in combination with carbon dioxide.

Carbonate – present where pH level is above 8.3. Typically, only present after the pH level has been increased chemically.

Silica - a naturally occurring dissolved mineral that can cause a glass etching, scale and water spots that are difficult to remove.

Cations – are ions with a positive (+) electrical charge. Cations are attracted to negatively charged cation ion-exchange resins.

Anions – are ions with a negative (-) electrical charge. Anions are attracted to positively charged anion ion-exchange resins.

TOC / Total Organic Carbon – the level of dissolved natural organic matter in water excluding carbon dioxide.

Hydrogen Sulfide / H₂S - a corrosive gas that smells like “rotten eggs”. Testing requires submitting water in a preserved sample bottle.

Arsenic – is a naturally occurring and toxic semi-metal element found in groundwater in some areas of the US and Canada.

Arsenic-Speciaded – the specific amounts of Arsenite (Type III/Trivalent) and Arsenate (Type V/Pentavalent) concentrations.

Aluminum – occurs naturally in ground water leached from rock and soil. Can also be the result of municipal water treatment.

Lead – the source is often within the plumbing system. It is present in older brass valves and fixtures and lead solder joints.

Coliform Bacteria – a non-pathogenic, vegetative bacteria used as an “indicator” organism to determine a water’s overall potability.

E. Coli Bacteria – a pathogenic bacteria only found in the digestive systems of warm-blooded animals and humans. Sources include poorly constructed wells and cisterns, shallow wells, streams, springs, lakes, ponds and failed septic systems.

Slime Forming Bacteria – a nuisance bacteria that can cause odor and thick slime build-up, particularly when water is aerated.

Iron Related Bacteria – a nuisance bacteria that metabolizes iron causing red/brown film, stringy growths and many types of odor.

Sulfate Reducing Bacteria – anaerobic bacteria that reduces the sulfate ion to hydrogen-sulfide gas and causes “rotten egg” odor.

NUISANCE BACTERIA POPULATION LEVELS (reported in cfu/ml – colony forming units per milliliter)

Slime Forming Bacteria	Iron Related Bacteria	Sulfate Reducing Bacteria
1,750,000 - Aggressive	570,000 - Aggressive	2,200,000 – Aggressive
440,000 – Aggressive	140,000 - Aggressive	500,000 – Aggressive
67,000 – Aggressive	35,000 – Aggressive	115,000 – Aggressive
13,000 - Moderate	9,000 – Aggressive	27,000 – Aggressive
2,500 - Moderate	2,200 – Aggressive	6,000 – Aggressive
500 – Moderate	500 – Moderate	1,400 – Moderate
100 – Not Aggressive	150 – Moderate	325 – Moderate
0 – None Present	25 - Moderate	75 – Moderate
	8 – Not Aggressive	20 – Not Aggressive
	0 – None Present	5-Not Aggressive
		0 – None Present

UNITS OF CONCENTRATION IN THIS REPORT

ppm = parts per million. Used interchangeably with **mg/l** = milligrams per liter.

ppb = parts per billion. Used interchangeably with **ug/l** = micrograms per liter

GPG - "grains per gallon" as calcium carbonate equivalent. Divide **GPG** by 17.1 to convert **GPG** into **ppm** or **mg/l**.

NTU - Nephelometric Turbidity Units indicates the amount of a light source reflected by particles. A level of 5 NTU or less looks clear.

Color – result in Color Units determined by the amount of light absorbed by the water sample. A level above 10 C.U. will appear tinted.

Quick Guide - Systems Solution Options																				
Parameter/Contaminant	Reverse Osmosis - RO System	RO with Total Defense Cartridge	RO with Arsenic Cartridge	Water Softener	Salt-Free Softener	Iron Clear - Iron OX5	Sulfur-Clear / Sulfur-OX3	Cullar - Activated Carbon	Filter-Clear - Depth Filter	Neutralizing Filter - Cullineu	Arsenic Filter - Whole House	Anion Exchange - Chloride Form	Chlorination	Catalytic Carbon	Carbon Block Filter	Non-Backwashing System	Ultra-Violet Light	De-Ionization	No Reliable Treatment	Application Notes
Alkalinity - high	•	•	•								•	•								Anion exchange will lower pH
Alkalinity - low									•			•								Chemical Feed w/ Soda Ash
Aluminum	•	•	•	•																Difficult to regenerate off resin
Ammonia	•	•	•	•																as ammonia ion
Antimony	•	•	•																	
Arsenic	•										•									RO only is for +5 only
Arsenic +3 /Trivalent/Arsenite			•								•									RO alone = +/- 60% removal
Arsenic +5/Pentavalent/Arsenate	•		•								•									AS cartridge recommended
Barium	•	•	•	•																
Beryllium	•	•	•	•																
Cadmium	•	•	•																	
Calcium (Hardness)	•	•	•	•	•															Salt-Free does not remove
Chloride	•	•	•																	
Chlorine	•	•	•				•						•	•	•					RO when used with carbon filter
Chloramine		•											•	•	•					
Chromium	•	•	•																	
Coliform Bacteria											•	•					•			Chlorination - 20 minute rule
Color							•	•		•										Pilot testing recommended
Conductivity (TDS) - High	•	•	•																	
Copper	•	•	•																	May need to increase pH
E. Coli Bacteria											•	•					•			Chlorination - 20 minute rule
Fluoride	•	•	•																	
Hardness (as CaCO3)				•	•															Combined Calcium & Magnesium
Hydrogen Sulfide (Gas/Odor)											•	•								Iron-OX5 not for H2S removal
Iron - Soluble/Ferrous/Clear Water			•			•	•													Iron will oxidize after sampling
Iron - Insoluble/Ferric/Rust						•		•												Cartridge filter option 10-micron
Iron Related Bacteria											•	•								UV not recommended
Lead - Point-of-Use	•	•	•																	RO or Preferred Series Filters
Lead - Point-of-Entry																				Pioneer Filter-4 gpm@15 psi loss
Magnesium (Hardness)				•	•															Salt-Free does not remove
Manganese				•																Iron filters will not remove
Mercury	•	•	•																	
Nitrate	•	•	•								•									RO will reduce by 70% to 80%
Nitrite	•	•	•																	Not removed by anion exchange
pH - Low											•	•								Chemical Feed w/Soda Ash
pH - High	•	•	•								•	•								Chemical Feed w/Citric Acid
PFOA / PFOS			•																	Certified POU and POE systems
Potassium	•	•	•																	
Phosphate	•	•	•																	
Radium 226 & 228	•	•	•	•																
Selenium	•	•	•																	
Silica	•	•	•																	Whole House RO for POE
Silver	•	•	•																	
Slime Forming Bacteria											•	•								UV not recommended
Sodium	•	•	•																	
Suspended Solids									•			•								Cartridge filter < 10-microns
Strontium																				Difficult to remove from water
Sulfate	•	•	•								•									Sulfate ion - Hydrogen Sulfide gas
Sulfate Reducing Bacteria											•	•								UV not recommended
Tannins (color present)									•		•									Pilot testing required
Thallium	•	•	•																	
TOC - Total Organic Carbon									•				•	•	•	•				UV destruct -285 nm for pure water
Trihalomethanes / DBPs			•											•	•					Requires long contact times
Turbidity			•						•			•								5 NTU or less for private wells
Uranium	•	•	•								•									Anion exchange is more complex
Volatile Organic Compounds - VOCs			•												•	•				Preferred Series Filters-POU
Zinc	•	•	•	•																

Notes: The product recommendations listed are potential solutions and may not be available in all states.
 Each water analysis is unique and must be reviewed to determine the best treatment approach.
 These recommendations are not guaranteed solutions and dealer/client is solely responsible for selection and application.
 Assistance with product selection is available from Technical Services, Regional Technical Advisors and Problem Water Specialist.

Culligan Water



2009331

Control Number: _____

S. Culligan

QUEST
al Laboratory
100

9399 W. Higgins Avenue
Rosemont, IL 60018

RW
-micro

SAMPLE SUBMITTED BY:

Account Number: 37708-1 **4934**
Account Name: Culligan Mid Atlantic / Webb Waterworks
Phone Number: 717-829-5331
E-mail: Umberger@CulliganMA.com
Person Taking Sample: Jody Oliver
Date Sample Taken: 9/23/20 Time Sample Taken: 12:00pm

CUSTOMER INFORMATION:

Customer Name: AS Billings Co.
Address: 4148 J Way
City: Havre De Grace State: MD Zip: 21078
Customer reported concern: _____

SAMPLE INFORMATION:

Water Supply: Private Municipal
Source: Surface Well Unknown
Condition: Treated Untreated
Sample Point: Faucet Equipment Other
Application: Household Commercial National Account
General Sample* Compliance Sample*
* if not marked, will treat as general sample

ANALYSIS REQUESTED:

SP# 10:51

Standard w/TOC Analysis: _____ Scale Analysis: _____
Problem Water Analysis: _____ Resin Analysis: _____
Comprehensive Analysis: _____ Depth Filter Analysis: _____
Basic Well: _____ Arsenic Filter: _____
Silver/Realtor Well: Total Coliform/e-Coli: _____
Expended Well: _____ Iron/Slime/Sulfate Bacteria: _____
Gold Well: _____
Special Analysis: (List Analysis Requested): _____

For Questions contact Maria Mozdzen at (847) 430-1219 or maria.mozdzen@culligan.com

LAB USE ONLY FOR COMPLIANCE SAMPLES:

Sample received in acceptable condition: Yes _____ No _____ Received by: GM Date: _____ Time: _____
If not reason: _____
Disposition of sample: _____

via phone Black will let

Litigation samples are not accepted by the laboratory

Customer: _____
Please Sign: _____
Print Name: _____

Jody know to resample
for micro.
Via phone L (broke)
stere
ok to run Rest of RW