N O R T H C A R O L I N A

Private Well Data Review

For Inorganic Analysis Reports

A Guide for Local Health Departments

The purpose of this guide is to assist the local health departments with preparing private well information and use recommendation reports for inorganic chemical contaminants.

Inorganic Analysis Data Review Reports:

1. *Complete the county, resident name (or address), sample id# (StarLIMS ID), and reviewer information at the top of the inorganic analysis data review report.*

2. *Compare well water results to table 1.*

Table 1. EPA Maximum Contaminant Levels, EPA Health Advisories and Health Based NC 2L Standards

Inorganic Contaminant	Standard (mg/L)	Source of Standard
Arsenic	0.01	Primary Maximum Contaminant Level[1]
Barium	2	Primary Maximum Contaminant Level[1]
Cadmium	0.005	Primary Maximum Contaminant Level[1]
Chromium	0.1	Primary Maximum Contaminant Level[1]
Copper	1.3	Primary Maximum Contaminant Level[1]
Fluoride	4	Primary Maximum Contaminant Level[1]
Iron	2.5*	North Carolina 2L Groundwater Standard[2]
Lead	0.015	Primary Maximum Contaminant Level[1]
Manganese	0.3	USEPA Health Advisory[1]
Mercury	0.002	Primary Maximum Contaminant Level[1]
Nickel	0.1	North Carolina 2L Groundwater Standard[2]
Nitrate/Nitrite	10/1	Primary Maximum Contaminant Level[1]
Selenium	0.05	Primary Maximum Contaminant Level[1]
Silver	0.02	North Carolina 2L Groundwater Standard[2]
Zinc	1	North Carolina 2L Groundwater Standard[2]

[1] United States Environmental Protection Agency (USEPA) Drinking Water Standards and Health Advisories, 2012
[2] North Carolina Department of Environment and Quality (NCDEQ); *NCDEQ Calculated HRE value

   a. *If all inorganic chemicals are at or below Table 1 values, then Check box [1]*
   b. *If one or more of the inorganic chemicals is above Table 1 values, then Check box [2] and check the appropriate box(es) for the contaminant(s)[2].*
   c. *If lead and/or copper were checked, Check box [4] and Check box [7], enter "1" for month and list lead and/or copper after "reinvestigate"*

3. *If lead does not exceed value in Table 1 (0.015 mg/L) but was detected at any level above the reporting limit (does not state <0.003), Check box [3] and Check box [4]*

4. *Check to see if box [2] is checked.*

a. *If box [2] is checked, skip step 4 and proceed to step 5.*
b. *If box [2] is unchecked, compare results to table 2.*

Table 2. Secondary MCL (aesthetic)

Inorganic Contaminant	**Secondary Maximum Contaminant Level[1] (mg/L)**
Chloride	250
Copper	1
Fluoride	2
Iron	0.3
Manganese	0.05
pH	6.5-8.5
Silver	0.1
Sulfate	250
Zinc	5

i. *If one or more of the inorganic chemicals are above Table 2 values, then Check box [5] and check the appropriate box(es) for the contaminant(s) under box [5].*

5. *Compare sodium results to 20 mg/L US EPA Health Advisory.*
   a. *If at or below the 20 mg/L US EPA advisory, proceed to step 6.*
   b. *If above the 20 mg/L advisory, then Check box [6a].*
   c. *If above 30 mg/L, then check boxes [6b].*

6. *If the following apply, check box [7] and enter "6" for month and list the contaminant(s) after "reinvestigate":*
   a. *Arsenic is at or below MCL, but at or above 0.009 mg/L;*
   b. *Nitrate is at or below MCL, but at or above 9 mg/L*
   c. *Nitrite is at or below MCL, but at or above 0.9 mg/L;*

[1] United States Environmental Protection Agency (USEPA) Drinking Water Standards and Health Advisories, 2012

Table 3. Inorganic Chemical Contaminant Additional Information

	Primary Maximum Contaminant Level[1] (mg/L)	USEPA Health Advisory[1] (mg/L)	North Carolina 2L Groundwater Standard[2] (mg/L)	Secondary Maximum Contaminant Level[1] (mg/L)	Health Effects[3,4]	Sources[3,4]	Aesthetic Effects[3,4]
Arsenic	0.01				Skin damage or problems with circulatory systems, and may have an increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass and electronic production wastes	
Barium	2				Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	
Cadmium	0.005				Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	
Chromium	0.1				Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	
Copper	1.3			1	Short term exposure: gastrointestinal distress; long-term exposure: liver or kidney damage; individuals with Wilson's Disease should consult their health care provider	Corrosion of household plumbing systems; erosion of natural deposits	Metallic Taste; blue-green staining

Fluoride	4			2	Bone disease at high levels; mottled teeth in children	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	Tooth discoloration
Iron			2.5*	0.3	Individuals with iron excess disease such as hemochromatosis should consult their health care provider	Erosion of natural deposits	Rusty color; sediments; metallic taste; reddish-orange staining
Lead	0.015				Infants and children: delays in physical or mental development; children could show slight defects in attention span and learning disabilities	Corrosion of household plumbing systems; erosion of natural deposits	
Magnesium						Erosion of natural deposits	Contributes to hard water; soap and detergent usage amounts increase
[5]Manganese		0.3		0.05	Neurological effects may occur in developing fetuses (pregnant women), infants and children,	Erosion of natural deposits	Brown - black color; black staining; bitter metallic taste
Mercury	0.002				Neurological effects	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	

Nickel		0.1	0.1		Decreased body and organ weights	Erosion of natural deposits; discharge from industries that make and use nickel.	
Nitrate/Nitrite	10/1				Infants below the age of six months of age who drink water containing nitrate in excess of the MCL could become seriously ill and, if left untreated, may die. Symptoms include shortness of breath and blue baby syndrome	Runoff from fertilizer use; leaking from septic tanks, sewage; erosion of natural deposits	
pH				6.5 - 8.5	Less than 4 or greater than 10 - gastrointestinal discomfort	Well construction problems; natural groundwater pH	Low pH: bitter, metallic taste; corrosion. High pH: slippery feeling, soda taste; deposits
Selenium	0.05				Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharges from mines	
Silver			0.02	0.1	At high concentrations: grey-blue skin discoloration (Argyria)	Water treatment devices for bacteria	Skin discoloration; greying of the white part of the eye
[6]Sodium		20		30-60	Individuals on a 500 mg/day sodium restricted diet	Erosion of natural deposits; filtration system backwash	Salty taste
Zinc			1	5	At high concentration: decreased blood enzyme levels	Erosion of natural products; well discharge	Metallic taste

[1] United States Environmental Protection Agency (USEPA) Drinking Water Standards and Health Advisories, 2012
[2] North Carolina Department of Environment and Quality (NCDEQ); *NCDEQ Calculated HRE value
[3] *American Water Works Association (AWWA) Plain Talk about Drinking Water, 2001*
[4] *USEPA Drinking Water Contaminants (http://water.epa.gov/drink/contaminants/index.cfm), 2013*
[5] *USEPA Drinking Water Health Advisory for Manganese, 2004*
[6] *USEPA Drinking Water Advisory: Consumer Acceptability Advice and Health Effects Analysis on Sodium, 2003*