

2017

Annual Drinking Water Quality Report

Marshall County Water Corporation

We're very pleased to provide you with this year's Annual Drinking Water Quality Report. We want to keep you informed about the excellent water and services we have delivered to you over the past year. Our goal is and always has been, to provide to you a safe and dependable supply of drinking water. This report shows our water quality and what it means.

Our water source is surface water from Lake Oteka and Lake Rex Smith also ground water from Antlers aquifer. An analysis of contamination susceptibility of our source water has been done. The analysis showed that our water's susceptibility to contamination LOW. This plan is available for viewing in our office. Information such as potential sources of contamination is listed in the plan.

If you have any questions about this report or concerning your water utility, please contact **Robert Moore at (580) 795-3368**. We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled meetings. They are held on They are held on second Tuesday of each month, at 6:00 P.M., at 400 East Main Street, Madill, Oklahoma.

Marshall County Water Corporation routinely monitors for contaminants in your drinking water according to Federal and State laws. This table shows the results of our monitoring for the period of January 1st to December 31st, 2016. (Some of our data may be more than one year old because the state allows us to monitor for some contaminants less often than once per year.) All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some contaminants. It's important to remember that the presence of these contaminants does not necessarily pose a health risk.

WATER QUALITY DATA TABLE

The table below lists all of the drinking water contaminants we detected for the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report.

In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

Non-Detects (ND) - laboratory analysis indicates that the constituent is not present.

Parts per million (ppm) or Milligrams per liter (mg/l)

Parts per billion (ppb) or Micrograms per liter (ug/l)

Parts per trillion (ppt) or Nanograms per liter (nanograms/l)

Parts per quadrillion (ppq) or Picograms per liter (picograms/l)

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Millirems per year (mrem/yr) - measure of radiation absorbed by the body.

Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Action Level (AL) - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Treatment Technique (TT) - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

Maximum Contaminant Level (MCL) - The MCL is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal - The MCLG is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MCLs are set at very stringent levels. To understand the possible health effects described for many regulated contaminants, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a significant increased risk of having the described health effect.

**NOTE: PLANT OTEKA WATER QUALITY DATA REPORT PAGES 2 – 11.
PLANT REX SMITH WATER QUALITY DATA REPORT PAGES 12 – 22.**

WATER QUALITY DATA FOR PLANT OTEKA

Contaminant	Sample Date	Violation Yes/No	Highest Level Detected	Range Detected	MCL	MCLG	Likely Source of Contamination
Microbiological Contaminants							
1. Total Coliform Bacteria (System takes ³ 40 monthly samples) (System takes <40 monthly samples)(highest number of samples in a single month)	Compliance Period 2016 Date Sampled MONTHLY	NO	Non-Detects	Non-Detects	5% positive 1 positive	0	Naturally present in the environment
2. Fecal coliform and E.coli(<i>highest number of samples in a single month</i>)	Compliance Period 2016 Date Sampled	NO	Non-Detects	Non-Detects	a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive	0	Human and animal fecal waste
3. Turbidity (NTU) (<i>highest single measurement</i>)	Compliance Period 2016 Date Sampled DAILY	NO	0.3		TT = 1 NTU	N/A	Soil runoff
4. Turbidity (NTU) (<i>highest monthly level</i>)	Compliance Period Date Sampled DAILY	NO	100%		TT ≤ 0.3 NTU in 95% of monthly samples	N/A	
5. Total Organic Carbon	Compliance Period 2016 Date Sampled July-16	NO	48.90%	48.90% - 48.90%	TT		Naturally present in the environment

Radiochemical Contaminants							
6. Gross Beta (pCi/L)	Compliance Period 2011-2019 Date Sampled 2/9/2015	NO	4.32	4.32 --- 4.32	50	0	Decay of natural and man-made deposits
7. Gross Alpha (pCi/L)	Compliance Period 2011-2019 Date Sampled 2/9/2015	NO	Non-Detects	0 --- 0	15	0	Erosion of natural deposits
8. Combined radium 226/228 (pCi/L)	Compliance Period 2011-2019 Date Sampled 2/9/2015	NO	0.265	0.265 --- 0.265	5	0	Erosion of natural deposits
9. Uranium (pCi/L or ug/l)	Compliance Period 2011-2019 Date Sampled 2/9/2015	NO	Non-Detects	0 - 0	20.1 pCi / L Or 30 ug / L	0	Erosion of natural deposits
Inorganic Contaminants							
10. Antimony (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder

11. Arsenic (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	10	0	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
12. Barium (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	64	64 --- 64	2000	2000	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
13. Beryllium (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
14. Bromate (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	10	0	By-product of drinking water ozonation
15. Cadmium (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints

16. Chloramines (ppm)	Compliance Period 2016 Date Sampled N/A	NO	Chloramines is not used as our primary disinfectant	Chloramines is not used as our primary disinfectant	MRDL = 4	MRDLG = 4	Water additive used to control microbes
17. Chlorine (ppm)	Compliance Period 2016 Date Sampled DAILY	NO	1	1	MRDL = 4	MRDLG = 4	Water additive used to control microbes
18. Chlorite (ppm)	Compliance Period 2016 Date Sampled MONTHLY	NO	0.866	0 --- 0.866	1	0.8	Water additive used to control microbes
19. Chlorine Dioxide (ppb)	Compliance Period 2016 Date Sampled N/A	NO	Chlorine Dioxide is not used as our primary disinfectant	Chlorine Dioxide is not used as our primary disinfectant	MRDL = 800	MRDLG = 800	Water additive used to control microbes
20. Chromium (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	<i>Non-Detects</i>	0 --- 0	100	100	Discharge from steel and pulp mills; erosion of natural deposits
21. Copper (ppm)	Compliance Period 2013 - 2015 Date Sampled Jul-15	NO	0.024	0 --- 0.024	AL=1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

22. Cyanide (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
23. Fluoride (ppm)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
24. Lead (ppb)	Compliance Period 2013 - 2015 Date Sampled Jul-15	NO	Non-Detects	0 - 0	AL=15 Action Level – 90% of samples must be below this level.	0	Corrosion of household plumbing systems, erosion of natural deposits
25. Mercury (ppb) (inorganic)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
26. Nitrate - NO ₃ (as Nitrogen) (ppm)	Compliance Period 2016 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

27. Nitrite - NO ₂ (ppm) (as Nitrogen)	Compliance Period 2016 Date Sampled 7/12/2016	NO	Non- Detects	0 --- 0	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
28. Selenium (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non- Detects	0 --- 0	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
29. Thallium (ppb)	Compliance Period 2011 - 2019 Date Sampled 7/12/2016	NO	Non- Detects	0 --- 0	2	0.5	Leaching from ore- processing sites; discharge from electronics, glass, and drug factories
Volatile Organic Contaminants							
30. Benzene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non- Detects	0 --- 0	5	0	Discharge from factories; leaching from gas storage tanks and landfills
31. Carbon tetrachloride (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non- Detects	0 --- 0	5	0	Discharge from chemical plants and other industrial activities

32. Chlorobenzene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	100	100	Discharge from chemical and agricultural chemical factories
33. o-Dichlorobenzene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	600	600	Discharge from industrial chemical factories
34. p-Dichlorobenzene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	75	75	Discharge from industrial chemical factories
35. 1,2-Dichloroethane (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	5	0	Discharge from industrial chemical factories
36. 1,1-Dichloroethylene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	7	7	Discharge from industrial chemical factories

37. cis-1,2-Dichloroethylene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	70	70	Discharge from industrial chemical
38. trans - 1,2 - Dichloroethylene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	100	100	Discharge from industrial chemical factories
39. Dichloromethane (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	5	0	Discharge from pharmaceutical and chemical factories
40. 1,2-Dichloropropane (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	5	0	Discharge from industrial chemical factories
41. Ethylbenzene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	700	700	Discharge from petroleum refineries

42. Haloacetic Acids (HAA5) (ppb)	Compliance Period 2016	YES	61	14	60	N/A	By-product of drinking water chlorination
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			57.4			
	11/8/2016						
43. Styrene (ppb)	Compliance Period 2014 - 2016	NO	Non-Detects	0	100	100	Discharge from rubber and plastic factories; leaching from landfills
	Date Sampled 5/12/2015			---			
				0			
44. Tetrachloroethylene (ppb)	Compliance Period 2014 - 2016	NO	Non-Detects	0	5	0	Leaching from PVC pipes; discharge from factories and dry cleaners
	Date Sampled 5/12/2015			---			
				0			
45. 1,2,4-Trichlorobenzene (ppb)	Compliance Period 2014 - 2016	NO	Non-Detects	0	70	70	Discharge from textile-finishing factories
	Date Sampled 5/12/2015			---			
				0			
46. 1,1,1 - Trichloroethane (ppb)	Compliance Period 2014 - 2016	NO	Non-Detects	0	200	200	Discharge from metal degreasing sites and other factories
	Date Sampled 5/12/2015			---			
				0			

47. 1,1,2 - Trichloroethane (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	5	3	Discharge from industrial chemical factories
48. Trichloroethylene (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	5	0	Discharge from metal degreasing sites and other factories
49. TTHM [Total trihalomethanes] (ppb)	Compliance Period 2016 Date Sampled 2/6/2016 5/10/2016 8/9/2016 11/8/2016	NO	68	34.5 --- 91	80	N/A	By-product of drinking water chlorination
50. Toluene (ppm)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	1	1	Discharge from petroleum factories
51. Vinyl Chloride (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	2	0	Leaching from PVC piping; discharge from plastics factories
52. Xylenes (ppb)	Compliance Period 2014 - 2016 Date Sampled 5/12/2015	NO	Non-Detects	0 --- 0	10	10	Discharge from petroleum factories; discharge from chemical factories

WATER QUALITY DATA FOR PLANT REX SMITH

Contaminant	Sample Date	Violation Yes/No	Highest Level Detected	Range Detected	MCL	MCLG	Likely Source of Contamination
Microbiological Contaminants							
1. Total Coliform Bacteria (System takes ³ 40 monthly samples) (System takes <40 monthly samples)(highest number of samples in a single month)	Compliance Period 2016 Date Sampled MONTHLY	NO	Non-Detects	Non-Detects	5% positive 1 positive	0	Naturally present in the environment
2. Fecal coliform and E.coli(<i>highest number of samples in a single month</i>)	Compliance Period 2016 Date Sampled MONTHLY	NO	Non-Detects	Non-Detects	a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive	0	Human and animal fecal waste
3. Turbidity (NTU) (<i>highest single measurement</i>)	Compliance Period 2016 Date Sampled DAILY	NO	0.66		TT = 1 NTU	N/A	Soil runoff
4. Turbidity (NTU) (<i>highest monthly level</i>)	Compliance Period Date Sampled DAILY	NO	97.8%		TT ≤ 0.3 NTU in 95% of monthly samples	N/A	
5. Total Organic Carbon	Compliance Period 2016 Date Sampled Monthly	NO	62.56%	40.29% - 62.56%	TT		Naturally present in the environment

Radiochemical Contaminants							
6. Gross Beta (pCi/L)	Compliance Period 2016			0.864			Decay of natural and man-made deposits
	Date Sampled 2/9/2016	NO	4.41	---	50	0	
	5/10/2016						
	8/9/2016			4.41			
	11/8/2016						
7. Gross Alpha (pCi/L)	Compliance Period 2016			0.094			Erosion of natural deposits
	Date Sampled 2/9/2016	NO	0.931	---	15	0	
	5/10/2016						
	8/9/2016			0.931			
	11/8/2016						
8. Combined radium 226/228 (pCi/L)	Compliance Period 2016			0.008			Erosion of natural deposits
	Date Sampled 2/9/2016	NO	0.259	---	5	0	
	5/10/2016						
	8/9/2016			0.259			
	11/8/2016						
9. Uranium (pCi/L or ug/l)	Compliance Period 2016			0			Erosion of natural deposits
	Date Sampled 2/9/2016	NO	1.02	-	20.1 pCi / L Or 30 ug / L	0	
	5/10/2016						
	8/9/2016			1.02			
	11/8/2016						
Inorganic Contaminants							
10. Antimony (ppb)	Compliance Period 2016			0			Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
	Date Sampled 5/10/2016	NO	Non-Detects	---	6	6	
	7/12/2016			0			

11. Arsenic (ppb)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	Non-Detects	0 --- 0	10	0	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
12. Barium (ppb)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	29	28 --- 29	2000	2000	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
13. Beryllium (ppb)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	Non-Detects	0 --- 0	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
14. Bromate (ppb)	Compliance Period 2016 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	10	0	By-product of drinking water ozonation
15. Cadmium (ppb)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	Non-Detects	0 --- 0	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints

16. Chloramines (ppm)	Compliance Period 2016 Date Sampled N/A	NO	Chloramines is not used as our primary disinfectant	Chloramines is not used as our primary disinfectant	MRDL = 4	MRDLG = 4	Water additive used to control microbes
17. Chlorine (ppm)	Compliance Period 2016 Date Sampled DAILY	NO	2	1 - 2	MRDL = 4	MRDLG = 4	Water additive used to control microbes
18. Chlorite (ppm)	Compliance Period 2016 Date Sampled MONTHLY	NO	0.866	0 --- 0.866	1	0.8	Water additive used to control microbes
19. Chlorine Dioxide (ppb)	Compliance Period 2016 Date Sampled N/A	NO	Chlorine Dioxide is not used as our primary disinfectant	Chlorine Dioxide is not used as our primary disinfectant	MRDL = 800	MRDLG = 800	Water additive used to control microbes
20. Chromium (ppb)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	<i>Non-Detects</i>	0 --- 0	100	100	Discharge from steel and pulp mills; erosion of natural deposits
21. Copper (ppm)	Compliance Period 2013 - 2015 Date Sampled Jul-15	NO	0.024	0 --- 0.024	AL=1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

22. Cyanide (ppb)	Compliance Period 2016 Date Sampled 7/12/2016	NO	Non-Detects	0 --- 0	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
23. Fluoride (ppm)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	Non-Detects	0 --- 0	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
24. Lead (ppb)	Compliance Period 2013 - 2015 Date Sampled Jul-15	NO	Non-Detects	0 - 0	AL=15 Action Level – 90% of samples must be below this level.	0	Corrosion of household plumbing systems, erosion of natural deposits
25. Mercury (ppb) (inorganic)	Compliance Period 2016 Date Sampled 5/10/2016 7/12/2016	NO	Non-Detects	0 --- 0	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
26. Nitrate - NO ₃ (as Nitrogen) (ppm)	Compliance Period 2016 Date Sampled 3/8/2016 5/10/2016 7/12/2016 10/11/2016	NO	Non-Detects	0 --- 0	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

27. Nitrite - NO ₂ (ppm) (as Nitrogen)	Compliance Period 2016	NO	Non- Detects	0	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
	Date Sampled 3/8/2016			---			
	5/10/2016						
	7/12/2016			0			
	10/11/2016						
28. Selenium (ppb)	Compliance Period 2016	NO	Non- Detects	0	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
	Date Sampled 5/10/2016			---			
	7/12/2016			0			
29. Thallium (ppb)	Compliance Period 2016	NO	Non- Detects	0	2	0.5	Leaching from ore- processing sites; discharge from electronics, glass, and drug factories
	Date Sampled 5/10/2016			---			
	7/12/2016			0			
Volatile Organic Contaminants							
30. Benzene (ppb)	Compliance Period 2016	NO	Non- Detects	0	5	0	Discharge from factories; leaching from gas storage tanks and landfills
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
31. Carbon tetrachloride (ppb)	Compliance Period 2016	NO	Non- Detects	0	5	0	Discharge from chemical plants and other industrial activities
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						

32. Chlorobenzene (ppb)	Compliance Period 2016	NO	Non-Detects	0	100	100	Discharge from chemical and agricultural chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
33. o-Dichlorobenzene (ppb)	Compliance Period 2016	NO	Non-Detects	0	600	600	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
34. p-Dichlorobenzene (ppb)	Compliance Period 2016	NO	Non-Detects	0	75	75	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
35. 1,2-Dichloroethane (ppb)	Compliance Period 2016	NO	Non-Detects	0	5	0	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
36. 1,1-Dichloroethylene (ppb)	Compliance Period 2016	NO	Non-Detects	0	7	7	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						

37. cis-1,2-Dichloroethylene (ppb)	Compliance Period 2016	NO	Non-Detects	0	70	70	Discharge from industrial chemical
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
38. trans - 1,2 - Dichloroethylene (ppb)	Compliance Period 2016	NO	Non-Detects	0	100	100	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
39. Dichloromethane (ppb)	Compliance Period 2016	NO	Non-Detects	0	5	0	Discharge from pharmaceutical and chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
40. 1,2-Dichloropropane (ppb)	Compliance Period 2016	NO	Non-Detects	0	5	0	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
41. Ethylbenzene (ppb)	Compliance Period 2016	NO	Non-Detects	0	700	700	Discharge from petroleum refineries
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						

42. Haloacetic Acids (HAA5) (ppb)	Compliance Period 2016	YES	61	14	60	N/A	By-product of drinking water chlorination
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			57.4			
	11/8/2016						
43. Styrene (ppb)	Compliance Period 2016	NO	Non-Detects	0	100	100	Discharge from rubber and plastic factories; leaching from landfills
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
44. Tetrachloroethylene (ppb)	Compliance Period 2016	NO	Non-Detects	0	5	0	Leaching from PVC pipes; discharge from factories and dry cleaners
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
45. 1,2,4-Trichlorobenzene (ppb)	Compliance Period 2016	NO	Non-Detects	0	70	70	Discharge from textile-finishing factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
46. 1,1,1 - Trichloroethane (ppb)	Compliance Period 2016	NO	Non-Detects	0	200	200	Discharge from metal degreasing sites and other factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						

47. 1,1,2 - Trichloroethane (ppb)	Compliance Period 2016	NO	Non-Detects	0	5	3	Discharge from industrial chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016						
	10/11/2016						
48. Trichloroethylene (ppb)	Compliance Period 2016	NO	Non-Detects	0	5	0	Discharge from metal degreasing sites and other factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
49. TTHM [Total trihalomethanes] (ppb)	Compliance Period 2016	NO	68	34.5	80	N/A	By-product of drinking water chlorination
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			91			
	11/8/2016						
50. Toluene (ppm)	Compliance Period 2016	NO	Non-Detects	0	1	1	Discharge from petroleum factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						
51. Vinyl Chloride (ppb)	Compliance Period 2016	NO	Non-Detects	0	2	0	Leaching from PVC piping; discharge from plastics factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						

52. Xylenes (ppb)	Compliance Period 2016	NO	Non-Detects	0	10	10	Discharge from petroleum factories; discharge from chemical factories
	Date Sampled 2/6/2016			---			
	5/10/2016						
	8/9/2016			0			
	10/11/2016						

Microbiological Contaminants:

- (1) Total Coliform. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially- harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
- (2) Fecal coliform/E.Coli. Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.
- (3) & (4) Turbidity. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
- (5) Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver, or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

Radiochemical Contaminants:

- (6) Gross Beta. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
- (7) Gross Alpha. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
- (8) Combined Radium 226/228. Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
- (9) Uranium. Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

Inorganic Contaminants:

- (10) Antimony. Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
- (11) Arsenic. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
- (12) Barium. Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
- (13) Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
- (14) Bromate. Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
- (15) Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
- (16) Chloramines. Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
- (17) Chlorine. Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
- (18) Chlorite. Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

- (19) Chlorine Dioxide. Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
- (20) Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
- (21) Copper. Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.
- (22) Cyanide. Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
- (23) Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.
- (24) Lead. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
- (25) Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
- (26) Nitrate. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
- (27) Nitrite. Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
- (28) Selenium. Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
- (29) Thallium. Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

Volatile Organic Contaminants:

- (30) Benzene. Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
- (31) Carbon Tetrachloride. Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
- (32) Chlorobenzene. Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
- (33) o-Dichlorobenzene. Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
- (34) p-Dichlorobenzene. Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
- (35) 1,2-Dichloroethane. Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
- (36) 1,1-Dichloroethylene. Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
- (37) cis-1,2-Dichloroethylene. Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
- (38) trans-1,2-Dichloroethylene. Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
- (39) Dichloromethane. Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
- (40) 1,2-Dichloropropane. Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
- (41) Ethylbenzene. Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
- (42) Haloacetic Acids. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
- (43) Styrene. Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
- (44) Tetrachloroethylene. Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
- (45) 1,2,4-Trichlorobenzene. Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

- (46) 1,1,1-Trichloroethane. Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
- (47) 1,1,2-Trichloroethane. Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
- (48) Trichloroethylene. Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
- (49) TTHMs [Total Trihalomethanes]. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
- (50) Toluene. Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
- (56) Vinyl Chloride. Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
- (57) Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

Oteka Treatment Plant:

We have not detected *Cryptosporidium* in the source water. We have to provide additional treatment if *Cryptosporidium* is found at greater than 0.075 oocyst per liter. We believe it is important for you to know that *Cryptosporidium* may cause serious illness in immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders. These people should seek advice from their health care providers.

Oteka Treatment Plant		
Contamination	Sample Date	Results
<i>Cryptosporidium</i>	October 11, 2016	<i>Non-Detects</i>
	November 8, 2016	<i>Non-Detects</i>
	December 13, 2016	<i>Non-Detects</i>

Rex Smith Treatment Plant:

We have not detected *Cryptosporidium* in the source water. We have to provide additional treatment if *Cryptosporidium* is found at greater than 0.075 oocyst per liter. We believe it is important for you to know that *Cryptosporidium* may cause serious illness in immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders. These people should seek advice from their health care providers.

Rex Smith Treatment Plant		
Contamination	Sample Date	Results
<i>Cryptosporidium</i>	October 11, 2016	<i>Non-Detects</i>
	November 8, 2016	<i>Non-Detects</i>
	December 13, 2016	<i>Non-Detects</i>

What does this mean?

The water quality data table shows that our system uncovered some problems this year. The duration of the violation was first Quarter 2016 the potential adverse health effects are Haloacetic Acids. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. We have corrected this by April 2016.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water before we treat it include:

- **Microbial contaminants*, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- **Inorganic contaminants*, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- **Pesticides and herbicides*, which may come from a variety of sources such as agriculture and residential uses.
- **Radioactive contaminants*, which are naturally occurring.

**Organic chemical contaminants*, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Marshall County Water Corporation is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

MCLs are set at very stringent levels. To understand the possible health effects described for many regulated contaminants, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a significant increased risk of having the described health effect.

If necessary include language for non-English speaking customers. The following is the Spanish translation for 'This report contains important information about your drinking water. Get someone to translate for you or talk to someone who understands it well.' Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted o hable con alguien que lo entienda bien.

Thank you for allowing us to continue providing your family with clean, quality water this year. In order to maintain a safe and dependable water supply we sometimes need to make improvements that will benefit all of our customers. These improvements are sometimes reflected as rate structure adjustments. Thank you for understanding.

Please call our office if you have questions.

This notice is being sent to you by Marshall County Water Corporation PWSID No: OK1010848

For further information contact:

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Address: 400 East Main, Madill, Oklahoma

Mailing Address: P.O. Box 688 Madill, Oklahoma

Phone Number: (580) 795-3368