

APPENDIX TO RULE 3745-96-02 -- REGULATED CONTAMINANTS TABLE

Key

AL=Action Level
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Level Goal
MFL=million fibers per liter
mrem/year=millirems per year (a measure of radiation absorbed by the body)

MRDL= Maximum Residual Disinfectant Level
MRDLG=Maximum Residual Disinfectant Level Goal
NTU=Nephelometric Turbidity Units
pCi/L=picocuries per liter (a measure of radioactivity)
mg/L=milligrams per liter; or ppm, parts per million

µg/L micrograms per liter; or ppb, parts per billion
ng/L= nanograms per liter; or ppt, parts per trillion
ppq=parts per quadrillion; or picograms per liter
TT=Treatment Technique

Contaminant / Chemical	MCL in Compliance Units	to convert for CCR, multiply by	MCL in CCR units	MCLG in CCR Units	Major Sources in Drinking Water	Health Effects Language
Microbiological Contaminants						
<i>E. coli</i>	Routine and repeat samples are total coliform- positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i> .	-	Routine and repeat samples are total coliform- positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i> .		Human and animal fecal waste	<i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens 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, the elderly and people with severely compromised immune systems.
Total Organic Carbon	TT		TT	N/A	Naturally present in the environment.	Total organic carbon(TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes (THM) and haloacetic acids (HAAs). Drinking water containing these by-products 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.
Turbidity	TT (NTU)	-	TT (NTU)	N/A	Soil runoff	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 which can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
Radioactive Contaminants						
Beta/photon emitters	4 mrem/yr	-	4mrem/yr (AL=50 pCi/L)	0	Decay of natural and man-made deposits	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.
Alpha emitters	15 pCi/L	-	15 pCi/L	0	Erosion of natural deposits	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.

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Appendix
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Contaminant / Chemical	MCL in Compliance Units	to convert for CCR, multiply by	MCL in CCR units	MCLG in CCR Units	Major Sources in Drinking Water	Health Effects Language
Combined radium	5 pCi/L	-	5 pCi/L	0	Erosion of natural deposits	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.
Uranium	30 µg/L	-	30 µg/L	0	Erosion of natural deposits	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						
Antimony	0.006 mg/L	1000	6 µg/L	6 µg/L	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	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.
Arsenic	0.010 mg/L ¹	1000	10 µg/L	0 ¹	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	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.
Asbestos	7 MFL	-	7 MFL	7 MFL	Decay of asbestos cement water mains; Erosion of natural deposits	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium	2 mg/L	-	2 mg/L	2 mg/L	Discharge of drilling wastes; Erosion of natural deposits; Discharge from metal refineries	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium	0.004 mg/L	1000	4 µg/L	4 µg/L	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Bromate	0.01 mg/L	1000	10 µg/L	0	By-product of drinking water chlorination.	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Cadmium	0.005 mg/L	1000	5 µg/L	5 µg/L	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chlorite	1 mg/L		1 mg/L	0.8 mg/L	By-product of drinking water chlorination.	Some infants and young children who drink water containing chlorite in excess of the MCL 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.
Chromium	0.1 mg/L	1000	100 µg/L	100 µg/L	Discharge from steel and pulp mills; Erosion of natural deposits	Some people who drink water containing chromium in well in excess of the MCL over many years could experience allergic dermatitis.
Copper	AL=1.3 mg/L	-	AL=1.3 mg/L	AL=1.3 mg/L	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives	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.
Cyanide	0.2 mg/L	1000	200 µg/L	200 µg/L	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories	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.

Contaminant / Chemical	MCL in Compliance Units	to convert for CCR, multiply by	MCL in CCR units	MCLG in CCR Units	Major Sources in Drinking Water	Health Effects Language
Fluoride	4 mg/L	-	4 mg/L	4 mg/L	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories	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. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Lead	AL=0.015 mg/L or Threshold Level = 0.015 mg/L	1000 or 1000	AL=15 µg/L or Threshold Level = 15 µg/L	0 or 0	Corrosion of household plumbing systems; Erosion of natural deposits	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.
Mercury [inorganic]	0.002 mg/L	1000	2 µg/L	2 µg/L	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate	10 mg/L	-	10 mg/L	10 mg/L	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	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.
Nitrite	1 mg/L	-	1 mg/L	1 mg/L	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits	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.
Selenium	0.05 mg/L	1000	50 µg/L	50 µg/L	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	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.
Thallium	0.002 mg/L	1000	2 µg/L	0.5 µg/L	Leaching from ore- processing sites; Discharge from glass, electronics, and drug factories.	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.
Synthetic Organic Contaminants including Pesticides and Herbicides						
2,4-D	0.07 mg/L	1000	70 µg/L	70 µg/L	Runoff from herbicide used on row crops	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP [Silvex]	0.05 mg/L	1000	50 µg/L	50 µg/L	Residue of banned herbicide	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	TT	-	TT	0	Added to water during sewage/ wastewater treatment	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Alachlor	0.002 mg/L	1000	2 µg/L	0	Runoff from herbicide used on row crops	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, experience anemia, and may have an increased risk of getting cancer.
Atrazine	0.003 mg/L	1000	3 µg/L	3 µg/L	Runoff from herbicide used on row crops	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.

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Benzo(a)pyrene [PAH]	0.0002 mg/L	1,000,000	200 ng/L	0	Leaching from linings of water storage tanks and distribution lines	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties or may have an increased risk of getting cancer.
Carbofuran	0.04 mg/L	1000	40 µg/L	40 µg/L	Leaching of soil fumigant used on rice and alfalfa	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane	0.002 mg/L	1000	2 µg/L	0	Residue of banned termiticide	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver, blood, or nervous system, and may have an increased risk of getting cancer.
Dalapon	0.2 mg/L	1000	200 µg/L	200 µg/L	Runoff from herbicide used on rights of way	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di(2-ethylhexyl) adipate	0.4 mg/L	1000	400 µg/L	400 µg/L	Discharge from chemical factories	Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.
Di(2-ethylhexyl) phthalate	0.006 mg/L	1000	6 µg/L	0	Discharge from rubber and chemical factories	Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
Dibromochloropropane	0.0002 mg/L	1,000,000	200 ng/L	0	Runoff/leaching from soil fumigant used on pineapples, soybeans, cotton, and orchards	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb	0.007 mg/L	1000	7 µg/L	7 µg/L	Runoff from herbicide used on soybeans and vegetables	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat	0.02 mg/L	1000	20 µg/L	20 µg/L	Runoff from herbicide use	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin [2,3,7,8-TCDD]	0.00000003 mg/L	1,000,000,000	30 ppq	0	Emissions from waste incineration and other combustion; Discharge from chemical factories	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Endothall	0.1 mg/L	1000	100 µg/L	100 µg/L	Runoff from herbicide use	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Epichlorohydrin	TT	-	TT	0	Discharge from industrial chemical factories; An impurity of some water treatment chemicals	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Ethylene dibromide	0.00005 mg/L	1,000,000	50 ng/L	0	Discharge from petroleum refineries	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate	0.7 mg/L	1000	700 µg/L	700 µg/L	Runoff from herbicide use	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or adverse reproductive difficulties.
Heptachlor	0.0004 mg/L	1,000,000	400 ng/L	0	Residue of banned pesticide	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.

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Heptachlor epoxide	0.0002 mg/L	1,000,000	200 ng/L	0	Breakdown of heptachlor	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
Hexachlorobenzene	0.001mg/L	1000	1 µg/L	0	Discharge from metal refineries and agricultural chemical factories	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
Hexachlorocyclopentadiene	0.05 mg/L	1000	50 µg/L	50 µg/L	Discharge from chemical factories	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their stomach or kidneys.
Lindane	0.0002 mg/L	1,000,000	200 ng/L	200 ng/L	Runoff/leaching from insecticide used on cattle, lumber, gardens	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor	0.04 mg/L	1000	40 µg/L	40 µg/L	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl [Vydate]	0.2 mg/L	1000	200 µg/L	200 µg/L	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
PCBs [Polychlorinated biphenyls]	0.0005 mg/L	1,000,000	500 ng/L	0	Runoff from landfills; Discharge of waste chemicals	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Pentachlorophenol	0.001 mg/L	1000	1 µg/L	0	Discharge from wood preserving factories	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram	0.5 mg/L	1000	500 µg/L	500 µg/L	Herbicide runoff	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Simazine	0.004 mg/L	1000	4 µg/L	4 µg/L	Herbicide runoff	Some people who drink water containing simazine in excess of the MCL over many years could experience tremors or have problems with their blood.
Toxaphene	0.003 mg/L	1000	3 µg/L	0	Runoff/leaching from insecticide used on cotton and cattle	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their thyroid, kidneys, or liver and may have an increased risk of getting cancer.
Volatile Organic Contaminants						
Benzene	0.005 mg/L	1000	5 µg/L	0	Discharge from factories; Leaching from gas storage tanks and landfills	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.
Carbon tetrachloride	0.005 mg/L	1000	5 µg/L	0	Discharge from chemical plants and other industrial activities	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.
Chlorobenzene	0.1 mg/L	1000	100 µg/L	100 µg/L	Discharge from chemical and agricultural chemical factories	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their kidneys or liver.
o-Dichlorobenzene	0.6 mg/L	1000	600 µg/L	600 µg/L	Discharge from industrial chemical factories	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.

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p-Dichlorobenzene	0.075 mg/L	1000	75 µg/L	75 µg/L	Discharge from industrial chemical factories	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.
1,2-Dichloroethane	0.005 mg/L	1000	5 µg/L	0	Discharge from industrial chemical factories	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.
1,1-Dichloroethylene	0.007 mg/L	1000	7 µg/L	7 µg/L	Discharge from industrial chemical factories	Some people who drink water containing 1,1- dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene	0.07 mg/L	1000	70 µg/L	70 µg/L	Discharge from industrial chemical factories	Some people who drink water containing cis-1,2- dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene	0.1 mg/L	1000	100 µg/L	100 µg/L	Discharge from industrial chemical factories	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.
Dichloromethane	0.005 mg/L	1000	5 µg/L	0	Discharge from pharmaceutical and chemical factories	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.
1,2-Dichloropropane	0.005 mg/L	1000	5 µg/L	0	Discharge from industrial chemical factories	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.
Ethylbenzene	0.7 mg/L	1000	700 µg/L	700 µg/L	Discharge from petroleum refineries	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Haloacetic Acids (HAA5)	0.06 mg/L	1000	60 µg/L	n/a	By-product of drinking water disinfection.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene	0.1 mg/L	1000	100 µg/L	100 µg/L	Discharge from rubber and plastic factories; Leaching from landfills	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.
Tetrachloroethylene	0.005 mg/L	1000	5 µg/L	0	Discharge from factories and dry cleaners	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.
1,2,4-Trichlorobenzene	0.07 mg/L	1000	70 µg/L	70 µg/L	Discharge from textile- finishing factories	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.
1,1,1-Trichloroethane	0.2 mg/L	1000	200 µg/L	200 µg/L	Discharge from metal degreasing sites and other factories	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.
1,1,2-Trichloroethane	0.005 mg/L	1000	5 µg/L	3 µg/L	Discharge from industrial chemical factories	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.
Trichloroethylene	0.005 mg/L	1000	5 µg/L	0	Discharge from metal degreasing sites and other factories	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.
TTHMs [Total trihalomethanes]	0.08 mg/L	1000	80 µg/L	n/a	By-product of drinking water chlorination	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.

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Toluene	1 mg/L	-	1 mg/L	1 mg/L	Discharge from petroleum factories	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.
Vinyl Chloride	0.002 mg/L	1000	2 µg/L	0	Leaching from PVC piping; Discharge from plastics factories	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes	10 mg/L	-	10 mg/L	10 mg/L	Discharge from petroleum factories; Discharge from chemical factories	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
Residual Disinfectants						
Chloramine	MRDL = 4 mg/L		MRDL = 4 mg/L	MRDLG = 4 mg/L	Water additive used to control microbes.	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 the excess of the MRDL could experience stomach discomfort or anemia.
Chlorine	MRDL = 4 mg/L		MRDL = 4 mg/L	MRDLG = 4 mg/L	Water additive used to control microbes.	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 the excess of the MRDL could experience stomach discomfort.
Chlorine dioxide	MRDL = 0.8 mg/L	1000	MRDL = 800 µg/L	MRDLG = 800 µg/L	Water additive used to control microbes.	Some infants and young children who drink water containing chlorine dioxide in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MCL. Some people may experience anemia.