



Orange Water and Sewer Authority 2007 Drinking Water Test Results Summary



Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Microbiological					
Total Coliform Bacteria (percent)	0	no range	presence of coliform bacteria in greater than 5% of the monthly samples	0	Naturally present in the environment
<i>E. coli</i> Bacteria (percent)	0	no range	a routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or <i>E. coli</i> positive	0	Human and animal fecal waste
Turbidity (NTU)	0.18 and 100% of samples below 0.3	0.01 to 0.18	TT = 1 NTU and 95% of samples below 0.3	0.3	A measure of the cloudiness of water. It may be caused by inorganic soil particles or fragments of organic matter that can interfere with treatment.
Radiological					
Gross Alpha (pCi/l) (last tested in 2004)	BDL	no range	15	0	Erosion of natural deposits
Gross Beta (pCi/L) (last tested in 2004)	BDL	no range	50	0	Decay of natural and man-made deposits
Radium 226 (pCi/l) (last tested in 2004)	BDL	no range	3	0	Erosion of natural deposits
Radium 228 (pCi/l) (last tested in 2004)	BDL	no range	2	0	Erosion of natural deposits

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Uranium (pCi/l) (last tested in 2004)	BDL	no range	20.1	0	Erosion of natural deposits
Inorganics					
Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Antimony (ppb)	BDL	no range	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic (ppb)	BDL	no range	10	0	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Asbestos (MFL) (last tested in 2002)	BDL	no range	7	7	Decay of asbestos-cement water mains; erosion of natural deposits Last tested 9/93
Barium (ppm)	BDL	no range	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium (ppb)	BDL	no range	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium (ppb)	BDL	no range	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium (ppb)	BDL	no range	100	100	Discharge from steel and pulp mills; erosion of natural deposits
Copper (ppm) (last tested in 2005)	BDL (90 th percentile, with 0 sample sites above the action level)	<0.050 to 0.067	1.3 (action level)	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Cyanide (ppb)	BDL	no range	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride (ppm)	1.00	0.79 to 1.00	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Lead (ppb) (last tested in 2005)	BDL (90 th percentile, with 0 sample sites above the action level)	no range	15 (action level)	0.0	Corrosion of household plumbing systems; erosion of natural deposits
Mercury (ppb)	BDL	no range	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
Nitrate (ppm)	BDL	no range	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (ppm)	BDL	no range	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium (ppb)	BDL	no range	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
Sodium (ppm)	31	21 to 31	not regulated	20 [proposed]	An element that occurs naturally in soils
Sulfate (ppm)	27	26 to 27	250 [Secondary MCL]	N/A	A mineral that occurs naturally in soils
Thallium (ppb)	BDL	no range	2	0.5	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories
Synthetic Organics, including Pesticides and Herbicides					
2,4-D (ppb) (last tested in 2006)	BDL	no range	70	70	Runoff from herbicide used on row crops
2,4,5-TP (ppb) (last tested in 2006)	BDL	no range	50	50	Residue of banned herbicide
Alachlor (ppb) (last tested in 2006)	BDL	no range	2	0	Runoff from herbicide used on row crops
Atrazine (ppb) (last tested in 2006)	BDL	no range	3	3	Runoff from herbicide used on row crops
Benzo(a)pyrene (ppt) (last tested in 2006)	BDL	no range	200	0	Leaching from linings of water storage tanks and distribution lines

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Carbofuran (ppb) (last tested in 2006)	BDL	no range	40	40	Leaching of soil fumigant used on rice and alfalfa
Chlordane (ppb) (last tested in 2006)	BDL	no range	2	0	Residue of banned termiticide
Dalapon (ppb) (last tested in 2006)	BDL	no range	200	200	Runoff from herbicide used on rights of way
Di(2-ethylhexyl)adipate (ppb) (last tested in 2006)	BDL	no range	400	400	Discharge from chemical factories
Di(2-ethylhexyl)phthalate (ppb) (last tested in 2006)	BDL	no range	6	0	Discharge from rubber and chemical factories
Dinoseb (ppb) (last tested in 2006)	BDL	no range	7	7	Runoff from herbicide used on soybeans and vegetables
Endrin (ppb) (last tested in 2006)	BDL	no range	2	2	Residue of banned insecticide
Heptachlor (ppt) (last tested in 2006)	BDL	no range	400	0	Residue of banned termiticide
Heptachlor Epoxide (ppt) (last tested in 2006)	BDL	no range	200	0	Breakdown of heptachlor
Hexachlorobenzene (ppb) (last tested in 2006)	BDL	no range	1	0	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene (ppb) (last tested in 2006)	BDL	no range	50	50	Discharge from chemical factories
Lindane (ppt) (last tested in 2006)	BDL	no range	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor (ppb) (last tested in 2006)	BDL	no range	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl (ppb) (last tested in 2006)	BDL	no range	200	200	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Polychlorinatedbiphenyls (PCBs) (ppt) (last tested in 2006)	BDL	no range	500	0	Runoff from landfills; discharge of waste chemicals
Pentachlorophenol (ppb) (last tested in 2006)	BDL	no range	1	0	Discharge from wood preserving factories
Picloram (ppb) (last tested in 2006)	BDL	no range	500	500	Herbicide runoff
Simazine (ppb) (last tested in 2006)	BDL	no range	4	4	Herbicide runoff
Toxaphene (ppb) (last tested in 2006)	BDL	no range	3	0	Runoff/leaching from insecticide used on cotton and cattle
Volatile Organics					
Benzene (ppb)	BDL	no range	5	0	Discharge from factories; leaching from gas storage tanks and landfills
Carbon Tetrachloride (ppb)	BDL	no range	5	0	Discharge from chemical plants and other industrial activities
Chlorobenzene (ppb)	BDL	no range	100	100	Discharge from chemical and agricultural chemical factories
o-Dichlorobenzene (ppb)	BDL	no range	600	600	Discharge from industrial chemical factories
p-Dichlorobenzene (ppb)	BDL	no range	75	75	Discharge from industrial chemical factories
1,2-Dichloroethane (ppb)	BDL	no range	5	0	Discharge from industrial chemical factories
1,1-Dichloroethylene (ppb)	BDL	no range	7	7	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene (ppb)	BDL	no range	70	70	Discharge from industrial chemical factories

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
trans-1,2-Dichloroethylene (ppb)	BDL	no range	100	100	Discharge from industrial chemical factories
Dichloromethane (ppb)	BDL	no range	5	0	Discharge from pharmaceutical and chemical factories
1,2-Dichloropropane (ppb)	BDL	no range	5	0	Discharge from industrial chemical factories
Ethylbenzene (ppb)	BDL	no range	700	700	Discharge from petroleum refineries
Styrene (ppb)	BDL	no range	100	100	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene (ppb)	BDL	no range	5	0	Leaching from PVC pipes; discharge from factories and dry cleaners
1,2,4-Trichlorobenzene (ppb)	BDL	no range	70	70	Discharge from textile-finishing factories
1,1,1-Trichloroethane (ppb)	BDL	no range	200	200	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane (ppb)	BDL	no range	5	3	Discharge from industrial chemical factories
Trichloroethylene (ppb)	BDL	no range	5	0	Discharge from metal degreasing sites and other factories
Total Haloacetic Acids (ppb)	44.4 (running yearly average)	32.0 to 59.0 (individual sample sites)	60 (running yearly average)	0	By-product of drinking water chlorination
Total Trihalomethanes (ppb)	41.9 (running yearly average)	27.5 to 56.1 (individual sample sites)	80 (running yearly average)	0	By-product of drinking water chlorination
Chloramines (ppm)	2.9 (running annual average of monthly distribution system samples Jan., Feb. and April through Dec.)	0.0 to 4.3 (range of individual distribution system samples Jan., Feb. and April through Dec.)	MRDL = 4	MRDLG = 4	Water additive used to control microbes.

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Chlorine (ppm)	1.28 (average of distribution system samples in March)	0.02 to 2.80 (range of individual distribution system samples in March)	MRDL = 4	MRDLG = 4	Water additive used to control microbes
Tolulene (ppm)	BDL	no range	1	1	Discharge from petroleum factories
Vinyl Chloride (ppb)	BDL	no range	2	0	Leaching from PVC piping; discharge from plastics factories
Xylenes (ppm)	BDL	no range	10	10	Discharge from petroleum factories; discharge from chemical factories
Unregulated Synthetic Organic Chemicals					
Aldicarb (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Aldicarb sulfone (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Aldicarb sulfoxide (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Aldrin (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Butachlor (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Carbaryl (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Dicamba (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Dieldrin (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
3-Hydroxycarbofuran (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Methomyl (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Metolachlor (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Metribuzin (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Propachlor (ppb) (last tested in 2006)	BDL	no range	not regulated	not regulated	N/A
Unregulated Volatile Organic Chemicals					
Chloroform (ppb)	12.0	no range	not regulated	not regulated	By-product of drinking water chlorination
Bromodichloromethane (ppb)	4.2	no range	not regulated	not regulated	By-product of drinking water chlorination
Bromoform (ppb)	BDL	no range	not regulated	not regulated	By-product of drinking water chlorination
Chlorodibromomethane (ppb)	BDL	no range	not regulated	not regulated	By-product of drinking water chlorination
Bromobenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
Bromochloromethane (ppb)	BDL	no range	not regulated	not regulated	N/A
Bromomethane (ppb)	BDL	no range	not regulated	not regulated	N/A
n-Butylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
sec-Butylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
tert-Butylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
Chloroethane (ppb)	BDL	no range	not regulated	not regulated	N/A
Chloromethane (ppb)	BDL	no range	not regulated	not regulated	N/A
o-Chlorotoluene (ppb)	BDL	no range	not regulated	not regulated	N/A
p-Chlorotoluene (ppb)	BDL	no range	not regulated	not regulated	N/A
Dibromomethane (ppb)	BDL	no range	not regulated	not regulated	N/A
m-Dichlorobenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
Dichlorodifluoromethane (ppb)	BDL	no range	not regulated	not regulated	N/A
1,1-Dichloroethane (ppb)	BDL	no range	not regulated	not regulated	N/A
1,3-Dichloropropane (ppb)	BDL	no range	not regulated	not regulated	N/A
2,2-Dichloropropane (ppb)	BDL	no range	not regulated	not regulated	N/A
1,1-Dichloropropene (ppb)	BDL	no range	not regulated	not regulated	N/A
1,3-Dichloropropene (ppb)	BDL	no range	not regulated	not regulated	N/A
Fluorotrichloromethane (ppb)	BDL	no range	not regulated	not regulated	N/A

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Hexachlorobutadiene (ppb)	BDL	no range	not regulated	not regulated	N/A
Isopropylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
p-Isopropyltoluene (ppb)	BDL	no range	not regulated	not regulated	N/A
Methyl-t-Butyl Ether (MTBE) (ppb)	BDL	no range	not regulated	not regulated	N/A
Naphthalene (ppb)	BDL	no range	not regulated	not regulated	N/A
n-Propylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
1,1,1,2-Tetrachloroethane (ppb)	BDL	no range	not regulated	not regulated	N/A
1,1,2,2-Tetrachloroethane (ppb)	BDL	no range	not regulated	not regulated	N/A
1,2,3-Trichlorobenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
1,2,3-Trichloropropane (ppb)	BDL	no range	not regulated	not regulated	N/A
1,2,4-Trimethylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A
1,3,5-Trimethylbenzene (ppb)	BDL	no range	not regulated	not regulated	N/A

Disinfection By-product Precursors

Substance and Unit Measurement	Highest Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Total Organic Carbon (ppm) Raw Water	6.8 (annual average of source water)	1.25 to 1.90 (range of Removal Ratios)	TT = Removal Ratio greater than or equal to 1.0	N/A	Naturally present in environment.
Total Organic Carbon (ppm) Treated	1.6 (annual average of filtered water)	1.25 to 1.90 (range of Removal Ratios)	TT = Removal Ratio greater than or equal to 1.0	N/A	Naturally present in environment.

Additional Unregulated Analyses

Substance and Unit Measurement	Average Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Microcystin (ug/L)	BDL	no range	not regulated	not regulated	Algal toxin released from blue green algae
Anatoxin-a (ug/L)	BDL	no range	not regulated	not regulated	Algal toxin released from blue green algae
Cylindrospermopsin (ug/L)	BDL	no range	not regulated	not regulated	Algal toxin released from blue green algae
Saxitoxin (ug/L)	BDL	no range	not regulated	not regulated	Algal toxin released from blue green algae
Chloride (mg/L)	11	no range	not regulated	not regulated	
Geosmin (ng/L) (last tested in 2005)	BDL	no range	not regulated	not regulated	Taste and odor metabolite released from algae
IBMP (ng/L) (last tested in 2005)	BDL	no range	not regulated	not regulated	Taste and odor metabolite
IPMP (ng/L) (last tested in 2005)	BDL	no range	not regulated	not regulated	Taste and odor metabolite
MIB (ng/L) (last tested in 2005)	13	no range	not regulated	not regulated	Taste and odor metabolite released from algae

Substance and Unit Measurement	Average Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
2,4,6-TCA (n/L) (last tested in 2005)	BDL	no range	not regulated	not regulated	Taste and odor metabolite
Cryptosporidium (oocysts/100L) (last tested in 2005)	BDL	no range	not regulated	not regulated	Intestinal protozoan found in human and animal fecal waste
Giardia (cysts/100L) (last tested in 2005)	BDL	no range	not regulated	not regulated	Intestinal protozoan found in human and animal fecal waste

Physical Water Quality Characteristics
The following characteristics impact the taste and appearance of drinking water.

Substance and Unit Measurement	Average Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Alkalinity (mg CaCO ₃ /L)	37	23 to 56	not regulated	not regulated	N/A
Calcium (ppm)	7.88	6.41 to 16.83	not regulated	not regulated	N/A
Color (CU)	0	0 to 4	No MCL	15	N/A
Iron (ppm)	0.01	0.00 to 0.04	No MCL	0.3	N/A
Manganese (ppm)	0.01	0.00 to 0.05	No MCL	0.05	N/A
Ortho-Phosphorus (ppm)	0.31	0.13 to 1.24	not regulated	not regulated	N/A
pH	8.2	7.1 to 8.7	No MCL	6.5 to 8.5	N/A
Specific Conductance (umhos/cm)	189.4	148.5 to 292.0	not regulated	not regulated	N/A
Total Hardness (mg CaCO ₃ /L)	30	14 to 76	not regulated	not regulated	N/A

Substance and Unit Measurement	Average Level Detected	Range Detected	Highest Level Allowed (MCL)	Highest Level Goal (MCLG)	Major Source in Drinking Water
Total Phosphorus (ppm)	0.45	0.12 to 1.55	not regulated	not regulated	N/A
Total Solids (ppm)	95	56 to 160	not regulated	not regulated	N/A
Total Suspended Solids (ppm)	0	no range	not regulated	not regulated	N/A

Glossary of Terms in Table

MCL - Maximum contaminant level - 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.

MCLG - Maximum contaminant level goal - 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.

SMCL - Secondary maximum contaminant level - limits set for aesthetic reasons. They are non-enforceable.

Action Level - The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement which a water system must follow.

90th Percentile – 90 percent of the samples were below this value. Required reporting unit for lead and copper.

BDL - Below detection level

ppm - Parts per million - equivalent to milligrams per liter (mg/L). One part per million is comparable to 1 penny in \$10,000.

ppb – Parts per billion – equivalent to micrograms per liter (ug/L). One part per billion is comparable to 1 penny in \$10,000,000.

ppt – Parts per trillion – equivalent to nanograms per liter (ng/L). One part per trillion is comparable to 1 penny in \$10,000,000,000.

NTU – Nephelometric Turbidity Units – Units of measurement used for turbidity or the cloudiness of water.

PCi/L – PicoCuries per liter – a measure of radioactivity in water with an activity equal to one millionth of a millionth of a curie.

MFL – Million Fibers per liter – a measure of the presence of asbestos fibers that are longer than 10 micrometers in water.

mg CaCO₃/L - Milligrams of calcium carbonate per liter water.

CU - Color units - a measurement used for color of water.

umhos/cm - Micromhos per centimeter - a measurement used for conductivity of water.

MRDLG – Maximum Residual Disinfection Level Goal – The “Level” of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

MRDL – Maximum Residual Disinfection Level - The “Highest Level” (MRDL) of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Removal Ratio – Measure of the effectiveness of Total Organic Carbon removal during treatment process. Actual percentage of Total Organic Carbon removed through treatment divided by the required percent removal. [(Raw TOC – Treated TOC)/Raw TOC]/Required % TOC Removal.