

## Keweenaw Peninsula Community Water Supply 1999 Consumer Confidence Reports

Each community reported drinking water supply information to residents and to the Michigan Department of Environmental Quality, Drinking Water and Radiological Protection Division, in compliance with the federal Safe Drinking Water Act. That information is summarized below. General water quality information is from the U.S. Environmental Protection Agency (EPA, [www.epa.gov/safewater](http://www.epa.gov/safewater)).

### *Sources of Keweenaw Peninsula community water supplies:*

**Adams Township.** Adams Township water is pumped from three 200-ft. deep wells from an aquifer just south of Painesdale. The Township has a pumping station with a 250,000-gallon storage facility to serve Atlantic Mine, Portage Township, the City of Hancock, and to supply our high-pressure storage facilities. The high-pressure system has a 250,000-gallon storage facility just north of Painesdale. It is supplied by booster pumps at the water pumping station and serves the towns of Baltic, Trimountain, Painesdale, and the Village of South Range. Chlorine is the only item added to the water system to maintain a chlorine residual as a precaution for possible entry of harmful bacteria into the distribution system. Adams Township is working on a formal Wellhead Protection Plan. The land area of the aquifer is forest land.

**Village of Ahmeek.** See Michigan American Water Company.

**Calumet Township.** See Michigan-American Water Company.

**Village of Calumet.** See Michigan-American Water Company.

**Camp Kitwen (Michigan Department of Corrections).** Camp Kitwen's drinking water comes from two wells located at the Camp. Both wells are 95 feet deep. The water from each well is pumped to a holding tank where water meters are read daily. The Camp uses about 22,000 gallons of water per day. There is no chlorination.

**Chassell Township.** Residents of Chassell Township receive a majority of their water from an artesian spring just west of town near Archambeau Road. Water from the spring flows by gravity to the chlorination plant where it is disinfected with chlorine. Also, four wells west of town in the same area as the spring provide extra capacity during high consumption periods. Well 2 is 139 ft., well 3 is 191 ft., well 4 is 150 ft., and well 5 is 196 ft. deep. Water pumped from these wells also flows to the chlorination plant where it is disinfected with chlorine.

**Copper City.** See Michigan-American Water Company.

**Copper Harbor.** Water for the Copper Harbor water system comes from six wells located south of Copper Harbor along Garden Brook. The wells are screened in glacial drift and are about 50 feet deep. The wells produce 20 to 27 gallons per minute (gpm) each. Water is pumped to a 125,000-gallon ground-level steel reservoir located south of the well field on the hill to Keweenaw Mountain Lodge. Chlorine is added to the water to kill harmful bacteria. No other chemicals are added.

**Eagle Harbor Township.** Eagle Harbor obtains its water from three wells located between Eliza Lake and Long Lake, west of the Village. Well depths are 50 feet, with bedrock depths of 90 feet. Each well can produce 90 gallons or more per minute. Though one well is sufficient to meet peak customer demands, additional wells provide for reliability in case of well failure, especially in winter months. A 5000-gallon hydropneumatic tank in the pump house at the well field maintains pressure. Water is delivered through 4,020 feet of a new 8-inch water main and approximately 2.6 miles of 65-year-old 3-inch pipe. Chlorine is added to the water to kill harmful bacteria, if any should be present. No other chemicals are added.

**Franklin Township District 2 (Ripley).** Ripley's drinking water comes from two wells at the end of Burt St. behind the Ripley School Apartments. Both wells are next to the pump house. Well #1 is 124 feet deep and Well #2 is 125 feet deep. The water from the wells is pumped to the storage tank on the Mt. Ripley Ski Hill, which holds 180,000 gallons of water.

**City of Hancock.** The City purchases its water from the Adams Township Water Authority. All of the City's water comes from three wells 200-feet-deep into an aquifer just south of Painesdale. Adams Township has a pump station and a 250,000-gallon storage facility. The water is pumped along a seven-mile water main to the City valve house at Scallon Street. The Scallon Street valve house diverts the water to the City's low-pressure district and the 300,000-gallon storage tank at Sampson Street. The rest of the water flows to the City's high-pressure district and the 1,000,000-gallon water storage facility

on Ingot Street, and water is also pumped to a new 200,000-gallon water tank in Quincy Township. The City uses about 550,000 gallons of water per day. The City has about 1,700 customers, of which 1,350 are single-family units. The City has about 30 miles of water distribution mains, about 19 miles of service laterals, and more than 230 hydrants in its water system. The City charges \$4.37 per 1,000 gallons of metered water. Chlorine is the only item added to the water system to maintain a chlorine residual as a precaution against possible entry of harmful bacteria into the distribution system.

Adams Township, in cooperation with the City, is working on a formal Wellhead Protection Plan. The land area of the aquifer source is forest land.

**City of Houghton.** Three wells that are 50 to 60 feet deep, located at the Isle Royale Sands, provide the City's water. A water filtration system is also located at the Sands. The water is piped from the Sands to four tanks: one at MTU that holds 440,000 gallons, two at Portage Street that hold 750,000 gallons, and one high-elevation tank in West Houghton that holds 275,000 gallons. The City uses about 1,100,000 gallons of water per day. The City has about 1,500 customers, of which 1,100 are single-family units. The City has about 30 miles of water distribution mains that are 4 to 16 inches in diameter, approximately 20 miles of service lines that are ¾ to 2 inches in diameter, and approximately 275 fire hydrants. Water charges are \$1.60 per 100 cubic feet (or 748 gallons). Chlorine is added to the water system to maintain a chlorine residual as a precaution for possible entry of harmful bacteria into the distribution system. The City's water supply contains high levels of iron and manganese [harmless but objectionable contaminants]. Soda ash and potassium permanganate are added to remove the iron and manganese from the ground water in conjunction with the filtration system that the City uses.

Portage Township purchases approximately 14,028,680 gallons of water per year from the City of Houghton. The City is working on a formal Wellhead Protection Plan. The land area of the aquifer is the Isle Royale Sands.

**Houghton County Memorial Airport.** The source of the water for the Houghton County Memorial Airport and its customers is the Michigan-American Water Company. Michigan-American's water comes from four wells at Calumet Water Works, approximately four miles northwest of Calumet.

**Hubbell.** See Michigan-American Water Company.

**Keweenaw Academy.** The water source is the well used by the former Calumet air base.

**Village of Lake Linden.** The Village's drinking water comes from two wells on the east end of Aspen Drive in Sibilsky Acres. The water is pumped from the wells to the 50,000-gallon water tank on the west end of Fourth Street. The Village has the capability to add chlorine for disinfection. Chlorine is added only on an emergency basis during major construction and repair projects. Customers of the Village of Lake Linden domestic water supply get their water from two wells that are 213 feet deep. The wells are flowing artesian wells and therefore enjoy an extra level of protection.

**Village of Laurium.** See Michigan-American Water Company.

**Michigan American Water Company.** Groundwater pumped from four wells at Calumet Water Works, approximately 4 miles northwest of Calumet, supplies Michigan-American Water Company. The company has been utilizing these wells since 1968. The depth of the wells is 100 feet. The water from this well supply is of excellent quality, requiring only minimal treatment. Chlorine and a corrosion inhibitor are added to the water to ensure that water quality is maintained throughout its journey from the treatment plant through the distribution mains to homes.

**Osceola Township (Dollar Bay).** Water for the Osceola Township water system comes from two wells near Portage Lake southwest of the tennis court. The wells are screened 60 feet deep in glacial drift. The wells produce about 350 gpm each. Water is pumped to a 100,000-gallon ground-level concrete reservoir on the hill north of M-26. Water is delivered to customers through 4-, 6-, and 8-inch diameter water mains. Chlorine is added to the water to kill any harmful bacteria. No other chemicals are added.

**Portage Township.** The Township purchases its water from the Adams Township Water Authority. The majority of the Township's water comes from three 200-ft. deep wells from an aquifer just south of Painesdale. Adams Township has a pump station and a 250,000-gallon storage facility. The water is pumped along a water main to the [Portage] Township's 100,000-gallon storage tank. Adams Township is working on a formal Wellhead Protection Plan. The land area of the aquifer sources is forest land. Chlorine is the only item added to the water system to maintain chlorine residual as a precaution against possible entry of harmful bacteria into the distribution system.

**Quincy Development Corporation—Mason.** The Mason water supply is groundwater from two wells off Sand Flats Road in Mason. These wells have a depth of 80 and 90 feet and have provided water for this system since 1942. The water from these wells does not require any treatment.

**Quincy Development Corporation—Quincy.** The Quincy water supply is groundwater pumped from two wells at the former Quincy Smelter site in Ripley. These wells are 100 feet deep and have provided water for this system since 1963. The water from these wells is of excellent quality and is not treated in any way.

**Sherman Township.** The water supply for Gay comes from Lake Superior through a tunnel bored about 2,700 feet out. The chemical alum is added to the water to help remove particles that make the water cloudy or turbid. The water then passes through sand filters to remove the particles. Chlorine is added in the treatment process to kill harmful bacteria.

**Village of South Range.** The Village purchases its water from the Adams Township Wholesale Water Supply. The Township operates three deep wells just south of Painesdale. A 10-inch water line feeds the South Range distribution system from a 250,000-gallon storage tank. This system also serves the towns of Baltic, Trimountain, and Painesdale. Chlorine is the only treatment item added to the water to maintain a chlorine residual as a precaution against possible entry of harmful bacteria into the distribution system. The Village of South Range serves 332 customers and maintains approximately 5 miles of water mains. The cost of the water is \$3.05 per 1,000 gallons. The south Range Public Works Department is responsible for the operation and maintenance of the distribution system within the Village. All Village full-time employees are required to have certification from the State of Michigan to operate and maintain the water distribution system.

### ***Why contaminants occur in drinking water:***

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. EPA sets standards for approximately 90 contaminants in drinking water. EPA's standards, along with each contaminant's likely source and health effects, are available at [www.epa.gov/safewater/mcl.html](http://www.epa.gov/safewater/mcl.html). or the Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Particularly at risk from infections are immune-compromised persons, such as those with cancer who are undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants. These people should seek advice from their health care providers about drinking water. The Environmental Protection Agency and the Centers for Disease Control have guidelines for appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants. For information, call the Safe Drinking Water Hotline (800-426-4791).

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 treatment include:

1. Microbial contaminants, such as viruses and bacteria, which may come from sewage plants, septic systems, agricultural livestock operations, and wildlife.
2. Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
3. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
4. Organic chemical contaminants including synthetic and volatile organic chemicals (SOCs and VOCs), which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
5. Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities.

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

***Terms and abbreviations used for contaminant measurements:***

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

**MCL** = Maximum Contaminant Level, the highest concentration 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.

**AL** = Action Level, the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that water systems must follow.

**TT** = Treatment Technique, a required process intended to reduce a contaminant in drinking water to a safe level.

**PPM** = Parts Per Million (milligrams per liter, mg/l), a measure of concentration comparable to one drop in 10 gallons.

**PPB** = Parts Per Billion (micrograms per liter, µg/l), a measure of concentration comparable to one drop in 10,000 gallons.

**NTU** = Nephelometric Turbidity Unit, a measure of the cloudiness of water

**pCi/l** = Picocurie Per Liter, a measure of radioactivity

**ND** = Not Detected

***Primary drinking water contaminants in Keweenaw Peninsula community water supplies, 1999:***

**INORGANIC CHEMICALS**

**Arsenic:** MCL = 50 ppb. MCLG = none.\* Source = erosion of natural deposits, runoff from orchards, runoff from glass and electronics production wastes. Range: 0-2 ppb, Michigan-American Water Company.

**Barium:** MCL = 2 ppm. MCLG = 2 ppm. Source = discharge of drilling wastes, discharge from metal refining, erosion of natural deposits. Range: 0.013-0.016 ppm, Michigan-American Water Company.

**Copper:** AL = 1.3 ppm. MCLG = 1.3 ppm. Source = corrosion of household plumbing, erosion of natural deposits, leaching from wood preservatives. Range: 0.04-0.43 ppm, 90 percent of samples below 0.340 ppm (none above AL), Michigan-American Water Company; ND to 0.18 ppm (4 sites), Sherman Township; 0.14 ppm, Eagle Harbor Township; 90 percent of samples below 0.760 ppm, Copper Harbor; 0-0.010 ppm (none above AL), Village of Lake Linden; 0.140 ppm (none above AL), Adams Township/Village of South Range; 0.375 ppm (none above AL), Franklin Township (Ripley); ND to 1.63 ppm (1 of 40 above AL), City of Houghton.

**Fluoride:** MCL = 4.0 ppm. MCLG = 4.0 ppm. Source = water additive to promote strong teeth, erosion of natural deposits discharge from fertilizer and aluminum factories. Range: ND, Sherman Township; 0.1 ppm, Eagle Harbor Township; ND, Camp Kitwen; 0.1 ppm, Village of Lake Linden; 0.1 ppm, Adams Township/Village of South Range; 0.1 ppm, Quincy Development Corp. (Mason); ND, Quincy Development Corp. (Quincy); 0.1 ppm, City of Hancock.

**Lead:** AL = 15 ppb. MCLG = 0. Source = corrosion of household plumbing, erosion of natural deposits. Range: 0-7 ppb, 90 percent of samples below 3 ppb (none above AL), Michigan-American Water Company; ND (4 sites), Sherman Township; 90 percent of samples below 6 ppb, Copper Harbor; ND (1 sample), Village of Lake Linden; 4.5 ppb (1 sample), Franklin Township (Ripley); ND to 27 ppb (4 of 40 above AL, 5 ppb, 27 ppb, 2 ppb, 1 ppb), City of Houghton; 2 of 20 samples above AL (16 ppb, 34 ppb) but 90 percent of samples below 7 ppb in 1996, none above AL in 1999, Village of South Range. [Note: while 4 of 40 City of Houghton samples were above the detection limit, only 1 was above the action level.]

**Nitrate:** MCL = 10 ppm. MCLG = 10 ppm. Source = fertilizer runoff, leaching from septic tanks and sewage, erosion of natural deposits. Range: 0.35-0.62 ppm, Michigan-American Water Company; ND, Sherman Township; 0.6 ppm, Camp Kitwen; 1.5 ppm, Chassell Township; 0.8 ppm, Quincy Development Corp. (Mason); 0.6 ppm, Quincy Development Corp. (Quincy); 1.5 ppm, Osceola Township (Dollar Bay); 0.39 ppm, City of Houghton.

**Nitrite:** MCL = 1 ppm. MCLG = 1 ppm. Source = runoff from fertilizer use, leaching from septic tanks or sewage, erosion of natural deposits. Range: ND, Sherman Township; ND, Camp Kitwen; ND, Quincy Development Corp. (Mason); ND, Quincy Development Corp. (Quincy).

**Selenium:** MCL = 50 ppb. MCLG = 50 ppb. Source = discharge from petroleum or metal refining, erosion of natural deposits, discharge from mines. Range: 0-2 ppb, Michigan-American Water Company.

## ORGANIC CHEMICALS

**Atrazine:** MCL = 3 ppb. MCLG = 3 ppb. Source = runoff from herbicide used on row crops. Range: ND, Sherman Township.

**Chloroform:** MCL = 0.10 ppm. Source = by-product of drinking water chlorination. Range: 0.0017 ppm, Copper Harbor; trace, Osceola Township (Dollar Bay).

**Dichlorobromomethane:** MCL = 0.10 ppm. Source = by-product of drinking water chlorination. Range: 0.0005, Copper Harbor.

**Pentachlorophenol:** MCL = 0.001 ppm. MCLG = 0. Source = discharge from wood preserving factories. Range: 0.00029 ppm, Osceola Township (Dollar Bay).

**Total Trihalomethanes (TTHMs):** MCL = 100 ppb. MCLG = none.\* Source = by-product of drinking water chlorination. Range: 8.5-18.4 ppb, annual average 11.6 ppb, Michigan-American Water Company; 32.3-97.1 ppb, annual average 58.9 ppb, Sherman Township; 2.2 ppb, Copper Harbor; 6.2-13.9 ppb, Chassell Township; trace, Osceola Township (Dollar Bay).

## RADIONUCLIDES

**Alpha Particles:** MCL = 15 pCi/l. MCLG = none.\* Source = erosion of naturally radioactive deposits. Range: <0.8 ( $\pm 1.4$ ), Michigan-American Water Company; 0.3-1.1 pCi/l, Copper Harbor; 8 pCi/l, Village of Lake Linden; 3 pCi/l, Chassell Township.

**Beta Particles:** MCL = 4 millirems/year, 50 pCi/l. MCLG = none.\* Source = decay of natural and man-made deposits of radioactive materials. Range: 0.4-1.6 pCi/l, Copper Harbor; 4 pCi/l, Village of Lake Linden.

**Radium 226/228:** MCL = 5 pCi/l, MCLG = none.\* Source = erosion of natural deposits. Range: 0.04 pCi/l, Village of Lake Linden.

## MICROORGANISMS

**Total Coliforms (Bacteria):** MCL = >5% of monthly samples or 1 sample where less than 40 samples are collected monthly. MCLG = 0. Source = Coliform bacteria are naturally present in the environment; fecal coliforms and *E. coli* are from human and animal waste. Range: ND, Michigan-American Water Company; ND, Sherman Township; 1 sample positive in well #2, Copper Harbor; ND, Village of Lake Linden; ND, Quincy Development Corp. (Mason); ND, Quincy Development Corp. (Quincy); positive (7/1/99 and 8/17/99), Osceola Township (Dollar Bay).

**Turbidity:** MCL = 5.0 NTU. MCLG = NA. Source = soil runoff (rough lake conditions or river flooding). Range: 0.18-0.35, annual average 0.31 NTU, Sherman Township.

***Secondary (aesthetic) drinking water contaminants in Keweenaw Peninsula community water supplies, 1999:***

**Chloride:** MCL = 250 ppm. Source = erosion of natural deposits, disposal of sewage or salt brines, road salting or improper salt storage. Range: 11.3-13.3 ppm, Michigan-American Water Company; ND, Camp Kitwen.

**Iron:** MCL = 0.3 ppm. Source = erosion of natural deposits, corrosion of iron or steel pipes, or growth of iron-producing bacteria. Range: ND, Camp Kitwen.

**Sulfate:** MCL = 250 ppm. Source = erosion of natural deposits. Range: 3.7-5.3 ppm, Michigan-American Water Company; 9 ppm, Eagle Harbor Township; 5 ppm, Camp Kitwen; 9.0 ppm, Village of Lake Linden; 6 ppm, Adams Township/Village of South Range; 11 ppm, Quincy Development Corp. (Mason); 15 ppm, Quincy Development Corp. (Quincy); 8 ppm, Osceola Township (Dollar Bay); 6 ppm, City of Hancock; 24 ppm, City of Houghton.

***Other unregulated drinking water contaminants in Keweenaw Peninsula community water supplies, 1999:***

**Calcium:** Source = erosion of natural deposits or disposal of industrial or domestic wastes. Range 29-36 ppm, Michigan-American Water Company.

**Hardness as CaCO<sub>3</sub>:** Source = calcium and magnesium. Range 66 ppm, Camp Kitwen.

**Magnesium:** Source = erosion of natural deposits. Range 5-7 ppm, Michigan-American Water Company.

**Sodium:** Source = erosion of natural deposits, road salting, water softening. Range 3-6 ppm, Michigan-American Water Company; 10 ppm, Copper Harbor; 39 ppm, Quincy Development Corp. (Mason); 0.007 ppm, Quincy Development Corp. (Quincy).

**Radon:** Source = natural decay of radioactive materials in soil and rock. Range 130-250 pCi/l, Michigan-American Water Company.

\* MCLGs were established by the 1986 Amendments to the Safe Drinking Water Act. The standard for this contaminant was established prior to 1986, and no MCLG has been set since then.

*This information was compiled by the GEM Center for Science and Environmental Outreach at Michigan Technological University from individual water supply Consumer Confidence Reports provided by the Michigan Department of Environmental Quality Drinking Water and Radiological Protection Division in Negaunee.*