# State of Ohio Class A Drinking Water Operator Certification Program

## Session Four: Supplemental Materials

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CONTENTS

# 1. Total Coliform

## Water Quality Parameters and Monitoring for Bacteria

Total coliform are monitored for regulatory compliance, as an indicator of the microbiological safety of water and for control (inactivation) of microorganisms, some of which may be pathogenic.

- Class A water systems may be required to collect distribution system samples for chlorine analyses to maintain compliance with the EPA Total Coliform Rule.
- Total coliform is a microbiological indicator used to assure that water delivered to the consumer is bacteriologically safe.
- Monitoring for total coliform will assist in identifying sources of contamination.
- Heterotrophic Plate Count (HPC) is a general indicator of the quantity of all types of bacteria, thereby a general indicator of the bacteriological quality of the water.
- Total Coliform monitoring is a requirement for all public water systems under Ohio Administrative Code 3745-81-21; Coliform monitoring requirements.
- If any routine sample(s) are positive for total coliform, then repeat samples must be taken as follows:
  - Systems that collect more than one sample per month must collect at least four repeat samples within 24 hours for routine each sample that tested positive for total coliform.
  - Systems that collect only one sample per month must collect at least four repeat samples within 24 hours for each routine sample that tested positive for total coliform.
  - Systems must continue to collect repeat samples until all samples are negative or it is determined that the system has violated the MCL.
  - Systems that collect less than five samples per month must collect at least five samples during the month immediately following the positive sample.
  - Any sample that tests positive for total coliform must be analyzed for E. coli or fecal coliform

### Analytical Tools

- Free and total chlorine — DPD Colorimetric — see Method 408.E of Standard Methods for the Examination of Water and Wastewater.
- Coliform Bacteria analytical methods include:
  - M-ColiBlue24® for detecting and counting fecal and total coliform within 24 hours

## 2. Key Monitoring and Reporting Requirements

### Microbiological (Coliform)

- Class A systems must monitor monthly or quarterly based on the type of system and population served.
- Samples are taken from the distribution system.
- A system is in acute MCL violation if:
  - Any routine sample is found to be total coliform positive and at least one repeat sample is total coliform positive.
  - Any routine sample is fecal coliform or E. coli positive.
  - Any repeat sample is found to be fecal coliform or E. coli positive.

### Inorganic Chemicals

- One sample every three years (groundwater sources) is required, or quarterly samples for at least 4 consecutive quarters if initial sample is over the MCL.
- Samples are taken from each point water enters the distribution system.
- A system is in violation if average of routine and check samples exceeds the MCL for any regulated inorganic chemical contaminant.

### Volatile Organic Chemicals and Synthetic Organic Chemicals

- One annual sample is required, or quarterly samples for at least 4 consecutive quarters if initial sample is over the MCL.
- Samples are taken from each point water enters the distribution system.

A system has exceeded the MCL if average of routine and check samples exceeds the MCL.

The Ohio Administrative Code, at section 3745-81-27, describes the total coliform analytical method.

3745-81-27

1. The standard sample volume required for a total coliform analysis is one hundred milliliters. The time from sample collection to initiation of analysis shall not exceed thirty hours. Systems are encouraged but not required to hold samples below ten degrees Celsius during transit.
2. Total coliform analyses shall be conducted in accordance with one of the following methods.
    a. Membrane filter (MF) technique, as set forth in "Standard Methods" section 9222.
    b. Enzyme substrate coliform test, as partially described in "Standard Methods" section 9223 and further explained in the twentieth (1998) edition of "Standard Methods" section 9223.
3. Fecal coliform analysis, for cases in which membrane filter analysis gives total coliform-positive results, shall use EC medium. Nutrient EC medium preparation is described on page 9-54 of "Standard Methods".
    a. The total coliform-positive culture is transferred by one of the following methods:
4. Remove the membrane containing the total coliform colonies from the substrate with a sterile forceps and carefully curl and insert the membrane into a tube of EC medium; or
    a. Swab the entire membrane filter surface with a sterile swab and transfer the inoculum to EC medium (do not leave the swab in the EC medium).
    b. Gently shake the inoculated tubes of EC medium to ensure adequate mixing and incubate in a waterbath at 44.5 ± 0.2 degrees Celsius for twenty-four plus or minus two hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test. Public water systems need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.
5. Escherichia coli (E. coli) analysis shall be done by a method identified in paragraph (D)(2)(b) or (D)(2)(c) of this rule. These methods allow simultaneous determination of the presence or absence of total coliforms and E. *coli* when applied to drinking water samples, but they are not approved for determining whether bacteria samples resulting from membrane filter tests contain E. coli.

## 3. Total Coliform References

References: See, www.epa.state.oh.us/ddagw/labcert.html (collection procedure for bacteria from the Laboratory Manual for the Microbiological Analyses of Public Drinking Water 2001).

### Bacteria Procedure

In order to properly complete the public water system information and sample information sections of the required microbiological Sample Submission Report form, the sampler should provide the laboratory with the following items:

1. The Ohio EPA District Office to receive the results.
2. The name of the PWS (public water system) that was sampled.
3. The six or seven digit PWSID # assigned to public water system by the Ohio EPA.
4. The mailing Address of the PWS that was sampled.
5. The County in which the PWS is located.
6. The Contact Name for the person responsible for the PWS.
7. The number of the Contact Phone for the contact person.
8. The Sample Collection Date must be indicated for sample to be acceptable for analysis.
9. The Time that the sample was collected must be indicated for sample to be acceptable for analysis.
10. The full name (not initials) of the person who collected the sample: Sample Collected By.
11. The number for the Collector's Phone.
12. The Sample Class (Routine, Repeat, Special, or Raw).
13. The Sample Monitoring Point (usually DS000, or the assigned RSOO# code if for a well).
14. If the sample class is Resample, the sample number of the previous sample with positive results that initiated the collection of the resample: Repeat for Sample #.
15. The Tap Address where the sample was collected, for example, 28 Main St.
16. The Sample Tap ID where the sample was collected for example, sink tap 2 - Jim's Grocery.

### Collection of Microbiological Drinking Water Samples: Total Coliform/Fecal Coliform/E.coli

The prescribed procedures must be followed in detail for a valid laboratory analysis

1. Select the sampling tap
    a. A tap, such as faucet, petcock, or small valve, is preferable. Do not sample from hoses or drinking water fountains.
    b. Avoid taps with a leak at the stem or taps with a swivel joint.

c. Aerated or screened nozzles may harbor bacteria. The aerator or screen must be removed before collection of the sample.

d. Place all carbon filters, sediment filters and water softeners on bypass unless operated by a public water system.

e. Sanitize the nozzle of the tap with a chlorine solution

   i. Use a 5.25% sodium hypochlorite solution, such as Clorox™ liquid bleach. Do not use chlorine solutions with special scents. To prepare a sanitizing solution that will contain about 400 mg/L of available chlorine (as hypochlorite) from the 5.25% sodium hypochlorite, add one ounce of bleach to one gallon of water (or *1* tablespoon per half-gallon. Store the mixed solution in a tightly closed screw capped container. The solution should be discarded and remade six months after preparation. Stronger solutions can be used, however, some faucet discoloration may result.

   ii. Flush the sample tap to waste for one minute. Close the valve.

   iii. Apply the sanitizing solution, prepared in step (i) above to the nozzle. This can be accomplished by either using a spray bottle or a plastic bag.

      (2) Using a spray bottle, saturate the tap opening with sanitizing solution then wait at least two minutes before proceeding, or

      (3) Place the bag over the nozzle and hold the top of the bag tightly on the tap. Alternately squeeze and release the bag to flush the solution in and out of the tap. Do this for two minutes. A fresh solution and bag must be used to sanitize each tap.

f. Flush the tap. The sample to be collected is intended to be representative of the water in the main. The tap must be opened fully and the water run to waste for at least 3-5 minutes to allow for adequate flushing of the piping between the tap and water main.

g. Reduce the flow from the tap. This will allow the samples bottle to be filled without splashing. Thereafter, run CL2 test free & total and then record the results.

h. Remove the cap from the sample bottle.

   i. Grasp the bottom of the sample bottle.

   ii. Remove the cap and hold the exterior of the cap between fingers while filling the sample bottle. Take care not to touch the mouth of the bottle or the inside of the cap with fingers or the sample could become contaminated.

   iii. The bottle must be open only during the collection of the sample.

I. Fill the sample bottles

   i. Do not rinse out the bottle before collecting the sample. Do not remove any 'pills' from the bottle. The bottle contains a small amount of sodium thiosulfate to neutralize the chlorine in the water

   ii. Do not touch the rim or mouth of the bottle during collection of the sample.

   iii. Do not overflow. Fill the bottle to within ¼-I" of the top.

j. Immediately recap the sample bottle tightly.

k. If there is any question as to whether a sample or bottle has become contaminated during collection of the sample, the sample must be discarded and a new sample collected in a new sample bottle.

l. Deliver the sample to the laboratory as soon as possible. The laboratory must receive the sample so that analysis can be completed (incubation initiated) within 30 hours after collection. Allow the laboratory adequate time to analyze the sample. Certified laboratories will not test samples >30 hours old because the results will be invalid and the laboratory risks loss of certification.

m. Additional information

   i. A sample identification slip (may use microbiological SSR form) is supplied with each sample bottle. The collection portion of the form is to be filled out in a legible manner using indelible pen, rubber stamp or typewriter. Do not use a fountain pen or other pens having water soluble ink.

   ii. Samples must be collected in bottles supplied by the certified laboratory performing the analyses. Bottles may be used from other certified laboratories provided the sample bottle supplying laboratory furnishes records of sample bottle sterility tests.

   iii. Samples must be accompanied by a properly completed sample identification slips. Sample identification slips that have not been properly completed as to name of water supply, address, date and time of collection, and signature of collector must not be accepted for bacteriological examination.

   Labs will not analyze samples for the following reasons:

   1 Time elapsed since sample collection >30 hours.

   2. Leaking or breakage of sample bottles in transit.

   3. Free chlorine residual in dechlorinated sample.

   4. Incomplete information for completion of SSRs.

   5. Samples frozen.

   6. Less than 100 ml of sample available.

   7. Any other reason that may affect test results.

## 4. Monitoring, Reporting and Waiver

Monitoring the public water system will show whether or not the chemicals added to the water are effective. Monitoring provides the basis for the analysis which will show whether or not the public water system is working within OEPA regulations.

The Ohio Administrative Code describes the rules for monitoring, reporting and waivers.

3745-83-01 Operational requirements.

(A) Except as otherwise noted, the definitions in rule 3745-81-01 of the Administrative Code shall apply to this chapter.

(B) Disinfection.

(1) For purposes of this rule of the Administrative Code, "major noncommunity public water system" means a noncommunity public water system designated by the director for which he deems it advisable, because of the relatively large number of people who drink or may drink water from the system, that the water be disinfected in the same manner as for a community public water system.

(2) Unless exempted under other provisions of this rule, each community public water system and each major noncommunity public water system shall maintain a minimum chlorine residual of at least two-tenths milligram per liter free chlorine, or one milligram per liter combined chlorine measured at representative points throughout the distribution system. The director may by order require higher residuals as necessary to compensate for pH, temperature, or other characteristics of the delivered water. Chlorine concentrations shall be analyzed in accordance with paragraph (C) of rule 3745-81-27 of the Administrative Code.

(3) A system is exempt from paragraph (B)(2) of this rule if it meets all the following conditions:

(a) The system obtains all its water from a ground water source which has, in the judgment of the director, been properly developed, constructed, and adequately protected; or from a system to which paragraph (B)(2) of this rule applies;

(b) The distribution system serving the water system, in the judgment of the director, has been properly constructed and maintained and is protected by an effective cross-connection program;

(c) The system, in the judgment of the director, has a satisfactory history of bacteriological monitoring indicating no contamination;

(d) The director has certified in writing that conditions of paragraphs (B)(3)(a), (B)(3)(b), and (B)(3)(c) of this rule have been met.

(4) A system is exempt from paragraph (B)(2) of this rule if, with written approval of the director, it uses chlorine dioxide as a primary or supplementary disinfectant in accordance with the terms of the approval.

(5) Each water system subject to paragraph (B)(2) of this rule and not exempt under paragraph (B)(3) of this rule shall install and place in operation equipment capable of meeting disinfection requirements of this rule.

(6) Notwithstanding the MRDL for total residual chlorine in paragraph (C) of rule 3745-81-10 of the Administrative Code, at times of actual or threatened outbreak of waterborne disease, each system subject to paragraph (B)(2) of this rule that may be affected by such outbreak shall maintain a minimum chlorine residual of at least one milligram per liter free chlorine, or six milligrams per liter combined chlorine measured at representative points throughout the distribution system, despite possible resulting tastes or odors in the delivered water.

(7) Finished water storage facilities, as defined in paragraph (E)(1) of this rule, serving community water systems or major non-community water systems shall be adequately disinfected in accordance with "American Water Works Association Standard C652-02 Disinfection of Water-Storage Facilities (2002)" before being placed in service and before being returned to service after repairs. A reservoir shall be considered adequately disinfected when analyses of at least two consecutive samples taken at twenty-four hour intervals are total coliform-negative. The consecutive samples taken in order to determine compliance with this paragraph shall be analyzed in accordance with paragraph (D) of rule 3745-81-27 of the Administrative Code. The standard sample used shall contain one hundred milliliters.

(8) All new, cleaned, or repaired water mains serving community water systems or major noncommunity water systems shall be disinfected in accordance with "American Water Works Association Standard C651-99 Disinfecting Water Mains (1999)." Samples taken in order to determine compliance with this paragraph shall each contain one hundred milliliters and shall be analyzed in accordance with paragraph (D) of rule 3745-81¬27 of the Administrative Code.

(a) A new or cleaned water main shall be considered adequately disinfected when analyses of at least two consecutive samples taken at twenty-four hour intervals are total coliform-negative.

(b) Repaired water mains shall be considered adequately disinfected when analyses of samples taken in accordance with "American Water Works Association Standard C651-99 Disinfecting Water Mains (1999), Section 4.7.5" are total coliform-negative.

(C) Approval of chemicals. All chemicals, substances, and materials added to or brought in contact with water in or intended to be used in a public water system or used for the purpose of treating, conditioning, altering, or modifying the characteristics of such water shall be shown by either the manufacturer, distributor, or purveyor to be non-toxic and harmless to humans when used in accordance with the formulation and concentration as specified by the manufacturer, and shall conform with the "American National Standards Institute/National Sanitation Foundation" (ANSI/NSF) standard 60 Drinking Water Treatment Chemicals - Health Effects (2001 and previous), or standard 61 Drinking Water System Components - Health Effects (2003 and previous). Any organization certified by

the "American National Standards Institute" may certify in writing that a product conforms with these standards.

(D) IMPORTANT - Minimum pressure. Community water systems shall maintain a minimum pressure of twenty pounds per square inch gauge at ground level at all points in the distribution system under all conditions of flow other than conditions caused by line breaks, extreme fire flows, or other extraordinary circumstances.

(E) Finished water storage facilities

(1) "Finished water storage facility" means a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection.

(2) A public water system shall provide a cover on all finished storage facilities so they are not open to the atmosphere.

(F) Reports.

(1) Community water systems.

(a) In addition to any other reporting requirement of Chapter 3745-81 of the Administrative Code, the operator of a community water system shall prepare an operation report for each month of operation on forms provided by the director. The director may require that the report include the following:

(i) General operation data;

(ii) A summary of samples analyzed, including distribution system sampling and chlorine residual sampling;

(iii) Information on daily water treatment and system pumpage;

(iv) Information on chemical application;

(v) Analysis of general parameters relating to the quality of the treated drinking water;

(vi) Source water levels;

(vii) Changes in personnel in responsible charge;

(viii) Such other information as may be necessary or desirable for the director to carry out his duties under Chapter 6109 of the Revised Code.

(b) The operation report shall be submitted to the district office with jurisdiction no later than the tenth of the month following the month for which the report was prepared.

(c) The operator shall report significant interruptions of service or of chlorination immediately by telephone to the district office with jurisdiction.

(2) Noncommunity water systems.

(a) The operator of a public water system other than a community public water system shall prepare and file an operation report at a frequency determined in writing by the director. The reports shall be on forms provided by the director and shall

contain such information as may be necessary for the director to carry out his duties under Chapter 6109 of the Revised Code.

(b) The operation report shall be submitted to the district office with jurisdiction no later than the tenth of the month following the end of the period for which the report was prepared.

[Comment: This rule incorporates the American water works association standards C651-99 and C652-02 by reference. Copies may be obtained from the "AWWA Bookstore, 6666 West Quincy Avenue, Denver, CO, 80235, 1-800-926¬7337, www.awwa.org." These standards are available for review at "Ohio EPA, Lazarus Government Center, 122 South Front Street, Columbus, OH, 43215¬3425."]

[Comment: This rule incorporates the ANSI/NSF standards 60 and 61 by reference. Copies may be obtained from "NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, MI, 48113-0140, (734)769-8010, www.nsf.org." These standards are available for review at "Ohio EPA, Lazarus Government Center, 122 South Front Street, Columbus, OH, 43215-3425."]

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## 5. Penalties

If a public water system violates the rules set by OEPA, then the public water system may be assessed penalties. Penalties may take the form of a money penalty, loss of certification of the operator, and may include the loss of the license to operate the public water system.

The Ohio Administrative Code describes the rules for penalties.

3745-81-04 Administrative penalties.

Pursuant to section 6109.23 of the Revised Code, the director may assess and collect administrative penalties from any person who owns or operates a public water system and violates Chapter 6109. of the Revised Code or the administrative rules adopted thereunder. Administrative penalties for a public water system shall be calculated according to this rule in the following manner. Each violation of the public water system shall be assigned a value of one thousand dollars. This amount represents the threat to public health caused by the public water system's failure to comply with the applicable regulations. This value is then multiplied by a number, expressed as a decimal, which represents the public water system's size, in accordance with the following list in order to determine the penalty amount for each day of each violation:

System size (number of people served) Number
At least 15 service connections or 25 to 3,300 0.25
3,301 to 6,700 0.50
6,701 to 10,000 0.75
10,001 or more 1.00
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Prior Effective Dates: 10/1/1999.

## 6. Regulated Contaminants

Certain contaminates are regulated by the EPA because the contaminants have been proven to cause adverse health issues. Ordinarily, contaminants do not present drinking water health concerns; however, if the level of contaminants rises above the threshold set by OEPA, then your community may be at risk of unsafe drinking water supplies.

The Ohio Administrative Code describes the rules governing contaminants.

3745-81-12 Maximum contaminant levels and best available technologies for organic contaminants.

A. Total trihalomethanes: the maximum contaminant level for total trihalomethanes of 0.10 milligram per liter applies to community public water systems that treat their water with any combination of chlorine, chloramines, chlorine dioxide and/or ozone. This level applies until January 1, 2002 to surface water systems which serve a population of ten thousand or more persons. This level applies until January 1, 2004 to ground water systems which serve a population of ten thousand or more persons. Compliance with the maximum contaminant level for total trihalomethanes is calculated according to paragraph (A) of rule 3745-81-24 of the Administrative Code.

B. The following maximum contaminant levels for total trihalomethanes and haloacetic acids (five) apply to community public water systems and nontransient noncommunity public water systems that treat their water with any combination of chlorine, chloramines, chorine dioxide or ozone. These levels apply beginning January 1, 2002, to surface water systems which serve a population of ten thousand or more persons. These levels apply beginning January 1, 2004, to surface water systems serving fewer than ten thousand persons and ground water systems. Compliance with the maximum contaminant levels for total trihalomethanes and haloacetic acids (five) is calculated according to paragraph (D) of rule 3745-81-24 of the Administrative Code. The director identifies the following as the best available technology (BAT), for achieving compliance with the maximum contaminant levels for organic disinfection byproducts identified in this paragraph:

| Contaminant | MCL (mg/L) | BAT |
|---|---|---|
| total trihalomethanes | 0.080 | enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant |
| haloacetic acids (five) | 0.060 | enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant. |

C. A public water system that is installing GAC or membrane technology to comply with the MCLS for TTHM and HAA5 may apply to the director for an extension of up to twenty-four months past January 1, 2002, but not beyond December 31, 2003. In granting this extension, the director shall set a schedule for compliance and may specify any interim measures that the public water system must take. Failure to meet the schedule or interim treatment requirements constitutes a violation of Ohio primary drinking water rules.

D. The following maximum contaminant levels (MCLs) apply to community public water systems and nontransient noncommunity public water systems. The associated best available technologies (BATs), designated as GAC for granular activated carbon and PTA for packed-tower aeration, identify the best technology, treatment techniques, or other means available for achieving compliance with the stated maximum contaminant levels. The director may determine that a public water system shall apply best available technology in order to reduce the level of a contaminant to below its maximum contaminant level.

| Contaminant | CAS number | MCL milligrams per liter | BAT |
|---|---|---|---|
| Vinyl chloride | 75-01-4 | 0.002 | PTA |
| Benzene | 71-43-2 | 0.005 | GAC PTA |
| Carbon tetrachloride | 56-23-5 | 0.005 | GAC PTA |
| p-Dichlorobenzene | 106-46-7 | 0.075 | GAC PTA |
| 1,2-Dichloroethane | 107-06-2 | 0.005 | GAC PTA |
| 1,1-Dichloroethylene | 75-35-4 | 0.007 | GAC PTA |
| Trichloroethylene | 79-01-6 | 0.005 | GAC PTA |
| 1,1,1-Trichloroethane | 71-55-6 | 0.2 | GAC PTA |
| o-Dichlorobenzene | 95-50-1 | 0.6 | GAC PTA |
| cis-1,2-Dichloroethylene | 156-59-2 | 0.07 | GAC PTA |
| trans-1,2-Dichloroethylene | 156-60-5 | 0.1 | GAC PTA |
| 1,2-Dichloropropane | 78-87-5 | 0.005 | GAC PTA |
| Dichloromethane | 75-09-2 | 0.005 | PTA |
| Ethylbenzene | 100-41-4 | 0.7 | GAC PTA |
| Monochlorobenzene | 108-90-7 | 0.1 | GAC PTA |
| Styrene | 100-42-5 | 0.1 | GAC PTA |
| Tetrachloroethylene | 127-18-4 | 0.005 | GAC PTA |
| Toluene | 108-88-3 | 1 | GAC PTA |
| 1,2,4-Trichlorobenzene | 120-82-1 | 0.07 | GAC PTA |
| 1,1,2-Trichloroethane | 79-00-5 | 0.005 | GAC PTA |
| Xylenes (total) | 1330-20-7 | 10 | GAC PTA |

E. The following maximum contaminant levels apply to community public water systems and nontransient noncommunity public water systems. The associated best available technologies (BATs), designated as GAC for granular activated carbon, PTA for packed-tower aeration, and OX for oxidation with chlorine or ozone, identify the best technology, treatment technique, or other means available for achieving compliance with the stated maximum contaminant levels. The director may determine that a public water system shall apply best available technology in order to reduce the level of a contaminant to below its maximum contaminant level.

| Contaminant | CAS number | MCL milligrams per liter | BAT |
|---|---|---|---|
| Alachlor | 15972-60-8 | 0.002 | GAC |
| Atrazine | 1912-24-9 | 0.003 | GAC |
| Benzo[a]pyrene | 50-32-8 | 0.0002 | GAC |
| Carbofuran | 1563-66-2 | 0.04 | GAC |
| Chlordane | 57-74-9 | 0.002 | GAC |
| 2,4-D | 94-75-7 | 0.07 | GAC |
| Dalapon | 75-99-0 | 0.2 | GAC |
| Dibromochloropropane (DBCP) | 96-12-8 | 0.0002 | GAC PTA |
| Di(2-ethylhexyl) adipate | 103-23-1 | 0.4 | GAC |
| Di(2-ethylhexyl) phthalate | 117-81-7 | 0.006 | GAC |
| Dinoseb | 88-85-7 | 0.007 | GAC |
| Diquat | 85-00-7 | 0.02 | GAC |
| Endothall | 145-73-3 | 0.1 | GAC |
| Endrin | 72-20-8 | 0.002 | GAC |
| Ethylene dibromide (EDB) | 106-93-4 | 0.00005 | GAC PTA |
| Glyphosate | 1071-53-6 | 0.7 | OX |
| Heptachlor | 76-44-8 | 0.0004 | GAC |
| Heptachlor epoxide | 1024-57-3 | 0.0002 | GAC |
| Hexachlorobenzene | 118-74-1 | 0.001 | GAC |
| Hexachlorocyclopentadiene | 77-47-4 | 0.05 | GAC PTA |
| Lindane | 58-89-9 | 0.0002 | GAC |
| Methoxychlor | 72-43-5 | 0.04 | GAC |
| Oxamyl (Vydate) | 23135-22-0 | 0.2 | GAC |
| Picloram | 1918-02-1 | 0.5 | GAC |
| Polychlorinated biphenyls (PCBs) | 1336-36-3 | 0.0005 | GAC |

| | | | |
|---|---|---|---|
| Pentachlorophenol | 87-86-5 | 0.001 | GAC |
| Simazine | 122-34-9 | 0.004 | GAC |
| 2,3,7,8-TCDD (Dioxin) | 1745-01-6 | 3x10-8 | GAC |
| Toxaphene | 8001-35-2 | 0.003 | GAC |
| 2,4,5-TP (Silvex) | 93-72-1 | 0.05 | GAC |

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## 7. Nitrates & Nitrites (Monitoring Schedule)

### Nitrate in Public Drinking Water

What is nitrate?

Nitrate ($NO_3$) is an inorganic chemical composed of nitrogen and oxygen. Nitrate contamination of drinking water usually results from runoff of agricultural fertilizers or from human or animal wastes, such as livestock feed lots or faulty septic systems.

How much nitrate is allowed in drinking water?

The maximum contaminant level (MCL) for nitrate in drinking water is 10 milligrams per liter (mg/L). This is the maximum allowable level of nitrate that may be present in drinking water without a high risk of causing health problems.

What are the health effects of nitrate?

Nitrate is essentially harmless to most people, but is considered an acute toxin to infants under six months of age. In infants, it causes a condition known as methemoglobinemia, or "blue-baby syndrome," which can be fatal. The most obvious symptom is a bluish skin coloring, especially around the eyes and mouth. Other symptoms can include shortness of breath, nausea, vomiting and dizziness. An infant with bluish skin should be taken immediately to a medical facility for treatment.

Blue-baby syndrome is caused when bacteria in the digestive tract of infants change the nitrate into nitrite, a much more harmful substance. The nitrite then enters the bloodstream, where it can lower the blood's ability to carry oxygen to the body, causing a blueness to the skin. Infants under six months of age are at higher risk than others because their digestive tract is not fully developed. By six months of age, the hydrochloric acid in the stomach increases to a level that kills most of the bacteria which change nitrate to nitrite, significantly reducing the risk of methemoglobinemia.

Healthy adults and older children can consume higher levels of nitrate than infants because of their fully-developed digestive systems. It is recommended that women who are pregnant or nursing consult with their physicians about limiting nitrate consumption. People with medical conditions that may make them more susceptible to methemoglobinemia, such as reduced stomach acidity, should also consult their physicians.

What precautions should be taken for someone at risk?

Substitute bottled water for tap water until the nitrate advisory is lifted. Boiling tap water will not get rid of the nitrate; it only concentrates it. It is safe to bathe or shower in tap water with elevated nitrate levels.

How often is monitoring required?

All public water systems (PWS) are required to monitor their water for the presence of nitrate.

Ground water systems typically monitor once a year. However, if nitrate is detected at 5 mg/L or greater, Ohio EPA requires quarterly monitoring (every three months). This increased monitoring allows Ohio EPA to better protect the public health by keeping a closer watch on water supplies with potential problems.

### What happens if the MCL is exceeded?

A public water system may have an MCL violation if a nitrate result is above 10 mg/IL. Another nitrate sample should be collected within 24 hours after the PWS is told about the high nitrate result. If the sample cannot be taken within 24 hours, the PWS must issue a public notice and collect the sample as soon as possible, but no later than two weeks after being told of the high nitrate result.

A nitrate MCL violation has an acute or immediate risk to human health. When a nitrate MCL violation is confirmed, public notice must be issued within 24 hours. Ohio EPA provides instructions on how to issue the public notice and a draft public notice. As proof that the public notice was issued, the system is required to complete a verification sheet and send it to Ohio EPA.

Taken from "Fact Sheet", January 2005
State of Ohio Environmental Protection Agency
Division of Drinking and Ground Waters, 122 South Front Street, Columbus, Ohio 43215
(614) 644-2752
www.epa.state.oh.us

## 8. Violations

If your public water system is in violation of any requirement, including any failure to monitor any parameter or any result exceeding a MCL, then the OEPA will issue a notice of violation.

Public Notices can be either Tier I or Tier II or Tier III.

Tier I Public Notice is described as:

- Acute MCL Violation.
- A violation or situation that may pose an acute risk to human health is requires that notice be given to the persons served by the public water system within 24 hours.

Tier II Public Notice is described as:

- Monthly MCL Violation.
- Issue as soon as practicable, but no later than 30 days after notification of the violation.
- If posted, notices must remain in place as long as the violation or situation exists, but at least for 7 days.

Tier III Public Notice is described as:

- Monitoring Violation
- A monitoring violation with no acute health risk.
- Issue as soon as practicable, but no later than 30 days after notification of the violation.
- If posted, notices must remain in place as long as the violation or situation exists, but at least for 7 days.

A Public Notice will include the following:

- Subject: Why the public water system is in violation.
- Rule governing the violation: OAC 3745-81-21.
- Monitoring period that was violated.
- Required sampling.
- Sample results submitted.
- Required monitoring period.
- Any actions required as a result of the monitoring violation.

| | |
|---|---|
| Comply with Rule 3745-81-32 | Notify water users via public notice |
| Method of Notification | Hand deliver or posting in conspicuous area served by the water system within 30 days of this letter |
| Verification to OEPA | Return to OEPA a copy of the notice as issued, along with the attached verification form, within 10 days after you notify your water users. |

## Nitrate Levels

- Nitrate level in drinking water is a serious health concern for infants less than six months old.
- Public notices must include the following information within 24 hours:

| |
|---|
| • DO NOT GIVE THE WATER TO INFANTS. *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.* Blue baby Syndrome is indicated by blueness of the skin. Symptoms in infants can develop rapidly, with health deteriorating over a period of days. If symptoms occur, seek medical attention immediately. |
| • Formula for children under six months of age should not be prepared with tap water. Instead, use bottled water or other water low in nitrates when preparing infant formula until further notice. |
| • DO NOT BOIL THE WATER. Boiling, freezing, filtering, or letting water stand does not reduce the nitrate level. Excessive boiling can make the nitrates more concentrated, because nitrates remain behind when the water evaporates. |
| • Adults and children older than six months can drink the tap water (nitrate is a concern for infants because they can't process nitrates in the same way adults can). However, if you are pregnant, nursing or have specific health concerns, you may wish to consult your doctor. |

## 9. Sample Public Notice of a Violation

April 26, 2006

Joe's Restaurant
Main Street
Small Town, OH 43678

Re: Joe's Restaurant
Shelby County
Transient Water System
PWSID No. 1234567

SUBJECT: Notice of Violation -- Failure to Sample Drinking Water for Total Coliform Bacteria

Your public water system is in violation of Rule 3745-81-21 of the Ohio Administrative Code for failure to comply with the coliform bacteria sampling requirements:

| | |
|---|---|
| Monitoring Period: | January - March 2006 |
| Required Coliform Sampling: | at least one routine sample |
| Sample Results Submitted: | NONE |
| Required Monitoring Periods: | Jan-Mar; Apr-June; July-Sept; Oct-Dec each year |

Actions required as a result of the above monitoring violation:

| | | |
|---|---|---|
| 1. | Comply with Rule 3745-81 -32: | Notify water users (public notice; example enclosed). |
| 2. | Method of Notification: | Hand delivery or posting conspicuously in area served by water system, within 30 days of this letter. |
| 3. | Verification to OEPA: | Return to us a copy of your notice as issued, along with the attached verification form, within 10 days after you notify your water users. |

Please mark your calendar to sample in future monitoring periods. Continued failure to monitor may subject you to legal action. If you have any questions, please contact me at (937) 285-6417.

Sincerely,

John Smith

Division of Drinking and Ground Waters

Enclosures

cc: County Health Department
Toni Buchanan, DDAGW/CO

SAMPLE

DRINKING WATER WARNING

[System] water is contaminated with [fecal coliform] or [E. coli]

BOIL YOUR WATER BEFORE USING OR USE BOTTLED WATER

Fecal coliform [or E. co/i] bacteria were found in the water supply on [date]. These bacteria can make you sick, and are a particular concern for people with weakened immune systems.

What should I do?

♦ DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for at least one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice. Boiling kills bacteria and other organisms in the water.

♦ Fecal coliforms and E. coil 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, some of the elderly, and people with severely compromised immune systems.

♦ The symptoms above are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

What happened? What is being done?

Bacterial contamination can occur when increased run-off enters the drinking water source (for example, following heavy rains). It also can happen due to a break in the distribution system (pipes) or a failure in the water treatment process. We are investigating and taking the necessary steps to correct the problem as soon as possible.

For more information, please contact _____at _____ or _____
name of contact phone number mailing address

General guidelines on ways to lessen the risk of infection by microbes are available from the EPA Safe Drinking Water Hotline at 1(800) 426-4791.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

PWSID#: _____ Date distributed: _____

Draft ContIngency Plan Template
August 2003

Joe's Restaurant
Water has high levels of nitrate

DO NOT GIVE THE WATER TO
INFANTS UNDER 6 MONTHS OLD
OR USE IT TO MAKE INFANT FORMULA OR JUICE

Results from water samples collected on June 5,2006 showed nitrate levels of 13.74 mg/L. This is above the nitrate standard, or maximum contaminant level (MCL), of 10 mg/L. Nitrate in drinking water is a serious health concern for infants less than six months old.

What should I do?

- DO NOT GIVE THE WATER TO INFANTS. *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 andblue babysyndrome.* Blue baby syndrome is indicated by blueness of the skin. Symptoms in infants can develop rapidly, with health deteriorating over a period of days. If symptoms occur, seek medical attention immediately.

- Formula for children under six months of age should not be prepared with tap water. Instead, use bottled water or other water low in nitrates when preparing infant formula until further notice.

- DO NOT BOIL THE WATER. Boiling, freezing, filtering, or letting water stand does not reduce the nitrate level. Excessive boiling can make the nitrates more concentrated, because nitrates remain behind when the water evaporates.

- Adults and children older than six months can drink the tap water (nitrate is a concern for infants because they can't process nitrates in the same way adults can). However, if you are pregnant, nursing or have specific health concerns, you may wish to consult your doctor.

What happened? What is being done?

Nitrate in drinking water can come from natural, industrial, or agricultural sources (including septic systems and run-off). Levels of nitrate in drinking water can vary throughout the year. We are investigating and taking the necessary steps to correct the problem as soon as possible.

For more information, please contact _____ at _____ or _____
name of contact phone number mailing address

*Please share this in formation with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

PWSID#: _____ Date distributed: _____

Tier 1: Total Coliform Notice

April 26, 2006

May 1, 2006
Joe's Restaurant
Main Street
Small Town, OH 43678

Re: Joe's Restaurant
Shelby County
Transient Water System
PWSID No. 1234567

SUBJECT: Notice of Violation -- Failure to Sample Drinking Water for Total Coliform Bacteria

Your public water system is in violation of Rule 3745-81-21 of the Ohio Administrative Code for failure to comply with the coliform bacteria sampling requirements:

| | |
|---|---|
| Monitoring Period: | January - March 2006 |
| Required Coliform Sampling: | at least one routine sample |
| Sample Results Submitted: | NONE |
| Required Monitoring Periods: | Jan-Mar; Apr-June; July-Sept; Oct-Dec each year |

Actions required as a result of the above monitoring violation:

| | | |
|---|---|---|
| 1. | Comply with Rule 3745-81 -32: | Notify water users (public notice; example enclosed). |
| 2. | Method of Notification: | Hand delivery or posting conspicuously in area served by water system, within 30 days of this letter. |
| 3. | Verification to OEPA: | Return to us a copy of your notice as issued, along with the attached verification form, within 10 days after you notify your water users. |

Please mark your calendar to sample in future monitoring periods. Continued failure to monitor may subject you to legal action. If you have any questions, please contact me at (937) 285-6417.

Sincerely,

John Smith
Environmental Specialist
Division of Drinking and Ground Waters

Enclosures

cc: County Health Department

## 10. Lead & Copper

- Samples for lead and copper must be taken every six months, unless the system is below the action levels for lead and copper for two consecutive six month periods or has optimized corrosion control. In that case samples must be taken annually.
- Small or medium sized systems (less than 10,000 persons served) that are below the action levels for lead and copper for three consecutive years may reduce sampling to once every three years.
- Samples are collected at a number of locations throughout the distribution system. The number of distribution samples that must be taken depends upon the number of persons served.
- A system has exceeded the MCL if the 90$^{th}$ percentile value of the samples collected in any monitoring period exceeds the action levels for lead or copper. The 90$^{th}$ percentile value is the value of the sample in the 90 percent position of the total numbers of sample collected.
- The action levels for lead and copper are 0.015 mg/L and 1.3 mg/L.

Lead and Copper Rule

This rule became effective in 1991 with revisions that became effective April 11, 2000. OEPA has primacy for enforcement. This rule deals mainly with lead and copper levels in water at the customers' tap. Major provisions of this rule include:

- Requires monitoring of lead and copper levels at customer taps. Monitoring requirements vary, depending upon the size of the system.
  - Monitoring requirements are broken down by systems serving more than 50,000 persons, systems serving 3,301 to 50,000 persons, and systems serving 3,300 or fewer persons.
  - Transient non-community water systems are excluded from this rule.
- Systems where lead and copper levels at the customer tap exceed action levels (0.015 mg/L for lead and 1.3 mg/L for copper) must institute corrosion control practices. This usually involves additional chemical treatment at the water treatment plant to raise pH and make the water more stable and less corrosive.
- Follow-up monitoring is required to verify corrosion control practices are working.

Water systems must provide educational information to their customers outlining the causes of elevated lead and copper levels, the health effects of lead and copper, and actions the customers can take on their own to reduce their risk of exposure.

SAMPLE

## Lead Tap Monitoring Report

Submit with form EPA 5105 Page 1 of 1 pages

| PWS Name Anytown Mobile Home Park | PWS I.D.1234567 | County Pickaway |
|---|---|---|
| Dates samples were collected: 05/02/06 | | |

(1) List this monitoring period's samples in order from the lowest lead concentration to the highest lead concentration. .
(2) Number the first column of each line used, starting with the number 1.
(3) Calculate the 90th percentile he number(s) according to the instructions and circle that number(s) and the lead concentration(s) for that sample(s).

| Line Number | Sample Date and Laboratory Sample Number | Address and Tap type | Structure Type SFR MFR or BLDG | Interior Plumbing Material Pb CuPb>82 CuPb<83 CuLF or other | Service Line Material Pb Cu or other | Tier 1 2 3 or other | Lead Concn. [Cu] ug/L |
|---|---|---|---|---|---|---|---|
| 1 | 05/02/06 82573 | 123 S. A St. Anytown R | *SFR* | *CuPb>82* | Cu | 1 | <5.0 |
| 2 | 05/02/06 82574 | 103 S. A St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | <5.0 |
| 3 | 05/02/06 82575 | 08 N. Main St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | <5.0 |
| 4 | 05/02/06 82576 | 20 N. Main St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | <5.0 |
| 5 | 05/02/06 82577 | 19 Front St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | <5.0 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Tap type codes B- Bathroom sink cold water tap; D- drinking fountain; K - kitchen sink cold water tap; R - rest room cold water tap; O - other tap (with prior Ohio EPA approval)

This report Is required under Revised Code sections 6109.04 and 6109.12. Noncompliance may result in civil. EPA 5108 12.97 NOTICE: penalities up to a maximum of 825,000 per violation under sections 6109.31 and 6109.33.

Calculation: This report shows no detectable amounts in the sample.

SAMPLE

## Copper Tap Monitoring Report

Submit with form EPA 5105 Page 1 of 1 pages

| PWS Name Anytown Mobile Home Park | PWS I.D. 1234567 | County Pickaway |
|---|---|---|
| Dates samples were collected 05/02/06 | | |

(1) List this monitoring period's samples in order from the lowest lead concentration to the highest lead concentration. .
(2) Number the first column of each line used, starting with the number 1.
(3) Calculate the 90th percentile he number(s) according to the instructions and circle that number(s) and the lead concentration(s) for that sample(s).

| Line Number | Sample Date and Laboratory Sample Number | Address and Tap type | Structure Type SFR MFR or BLDG | Interior Plumbing Material Pb CuPb>82 CuPb<83 CuLF or other | Service Line Material Pb Cu or other | Tier 1 2 3 or other | Copper Concn. [Cu] ug/L |
|---|---|---|---|---|---|---|---|
| 1 | 05/02/06 82573 | 123 S. A St. Anytown R | *SFR* | *CuPb>82* | Cu | 1 | 928 |
| 2 | 05/02/06 82574 | 103 S. A St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | 1030 |
| 3 | 05/02/06 82575 | 08 N. Main St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | 1050 |
| 4 | 05/02/06 82576 | 20 N. Main St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | 1249 |
| 5 | 05/02/06 82577 | 19 Front St. Anytown R | *SFR* | CuPb>82 | Cu | 1 | 1449 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Tap type codes B- Bathroom sink cold water tap; D- drinking fountain; K - kitchen sink cold water tap; R - rest room cold water tap; O - other tap (with prior Ohio EPA approval)

This report Is required under Revised Code sections 6109.04 and 6109.12. Noncompliance may result in civil. EPA 5108 12.97 NOTICE: penalities up to a maximum of 825,000 per violation under sections 6109.31 and 6109.33.

## Calculation:

Add 4th and 5th lines together and divide by 2: (1249 + 1449) divided by 2 = 1349. The violation is 1350.

# 11. CORROSION CONTROL

## Protecting Public Health

Corrosive water can leach toxic metals from the distribution and household plumbing systems. Two metals that are most likely to cause concern because they are commonly found in household plumbing systems are:

- Lead
- Copper

Corrosion of older cast iron water mains can cause the formation of iron deposits called tubercules. These deposits can protect bacteria and other microorganisms from chlorine allowing them to grow creating a public health hazard.

## Improving Water Quality

Corrosive water can attack metal piping causing taste, odor, and color problems in a water system. Red-water can occur when iron is dissolved from cast-iron water mains by corrosive water. Corrosive water can also affect lead and copper piping. Corrosive water can affect water quality in the following ways:

- Stains plumbing fixtures and laundry
- Aesthetically unappealing for drinking and bathing
- Provide food for harmful microorganisms
- Cause public health concerns from leaching of lead and copper into the water supply

## Extending the Life of Plumbing Equipment

Corrosive water can result in significant costs to water systems and customers by:

- Significantly reducing the life of valves, unprotected metals and pipes
- Shortens the service life of plumbing fixtures
- Shortening the useful life of a hot water heater

## Meeting Federal and State Regulations

In 1991 the US Environmental Protection Agency (USEPA) enacted the Lead and Copper Rule. All water systems are required to check if their water is corrosive enough to cause lead and copper corrosion products to appear in the customer's water at levels exceeding the new action levels. The new action levels are as follows:

- Lead – 0.015 mg/L or 15.5 ug/L (ug = microliter) at the 90th percentile of the number of samples tested.
- Copper – 1.3 mg/L or 1,350 ug/L (ug = microliter) at the 90th percentile of the number of samples tested.

If the action level is exceeded, the water system is required to take action to reduce the corrosivity of the water.

## Water System Corrosion

Corrosion can be broadly defined as the wearing away or deterioration of a metal due to chemical reactions with its environment. The most familiar example is the formation of rust (oxidized iron) when an iron or steel surface is exposed to moisture.

Water that promotes corrosion is known as corrosive or aggressive water. In water treatment operations, corrosion can occur to some extent with almost any metal that is exposed to water. How extensive the corrosion will be depends on several factors.

## Factors Affecting Corrosion

The rate of corrosion depends on many site-specific conditions, such as the characteristics of the water and the type of pipe material. Chemical reactions play a critical role in determining the rate of corrosion. The following factors affect the corrosion rate:

- Dissolved Oxygen – as the concentration of DO increase so does the rate of corrosion.
- Total Dissolved Solids – as the TDS increases water becomes a better conductor, which in turn increase the rate of corrosion.
- Alkalinity and pH – Generally as alkalinity and pH increase, the rate of corrosion decreases.
- Temperature – because chemical reactions occur more quickly at higher temperatures, an increase in water temperature generally increases the corrosion rate.
- Type of metal – metals that easily give up electrons will corrode easily.

## Types of Corrosion

Corrosion in water systems can be divided into two broad classes:

- Localized – the most common type found in water systems, attacks the metal surfaces unevenly.
- Uniform – corrosion takes place at an equal rate over the entire surface.

## Corrosion Control Methods

The basic methods used for stabilizing water to protect against the problems of corrosion are:

- Adjustment of alkalinity and pH
- Formation of a calcium carbonate coating
- Use of corrosion inhibitors and sequestering agents

## Adjustment of alkalinity and pH

Generally soft waters that have a pH of less than 7 and are slightly buffered (low alkalinity) will be corrosive to lead and copper. Water that has too much alkalinity can also be quite corrosive. In, general a moderate increase in pH and alkalinity levels can reduce corrosion. The following are some chemicals commonly used to adjust alkalinity and pH:

- Lime – used to adjust both pH and alkalinity, it is less expensive than other chemicals having the same effect.
- Soda Ash – can be added with lime to further increase a waters alkalinity.
- Sodium Bicarbonate – used sometimes instead of Soda ash, because it will increase alkalinity without as much of an increase in pH.
- Caustic Soda – when used with soda ash or sodium bicarbonate will increase pH and alkalinity.

## Formation of a Calcium Carbonate Coating

A common protective-coating technique is to adjust the pH of the water to a level just above the saturation point of calcium carbonate. When this level is maintained, calcium carbonate will precipitate and form a protective coating on the inside of the pipe walls. The same chemicals use to adjust pH and alkalinity can be used to develop the protective coating of calcium carbonate.

## Use of Corrosion Inhibitors and Sequestering Agents

Some waters do not have enough calcium or alkalinity to make the formation of a calcium carbonate coating economical. Therefore the addition of corrosion inhibitors and sequestering agents are used to control corrosion. The most common compounds used are:

- Polyphosphates
- Silicates

The chemical reactions by which these compounds combine with corrosion products to form a protective layer are not completely understood; however, the chemicals have proven successful in many water systems.

Some polyphosphates also sequester iron, whether it is dissolved in water from the source or from corrosion of the system.

## 12. Consumer Confidence Reports

(CCR Information taken from Small Water System Operation and Maintenance, 4th Edition, at page 497, published by California State University, Sacramento and the USEPA, Office of Drinking Water)

EPA has developed regulations requiring every public water system to prepare and distribute an annual Consumer Confidence Report. The reports are an opportunity for positive communication with consumers and a means to convince consumers of the importance of paying for good quality water.

Consumer Confidence Reports are an effective way for a water utility to communicate with consumers that their water is safe to drink. These reports also provide an opportunity to inform rate payers of the need for sufficient funds to properly operate and maintain the water supply, treatment, and distribution systems. If higher rates are necessary to fund a capital improvement program, the reports can explain the importance of having sufficient water with adequate pressure and high quality.

Items that should be covered in Consumer Confidence Reports include:

1. Information on source of drinking water supply,

2. Brief definition of terms, List of contaminants detected including level detected, MCL (maximum contaminant level), and MCLG (maximum contaminant level goal),

3. For MCLs violated, information on health effects, and

4. Information on any unregulated contaminants.

Some utility agencies try to have an article published in the local newspaper explaining the report before it is made available to consumers. This advance information helps the consumers understand the report.

CCR's should be a short, concise letter report of one or two pages that can be mailed directly to consumers or mailed in the envelope with the utility bill.

All utility staff should be familiar with the contents of the report because consumers who know individual staff members frequently will ask questions about the report.

Water utilities should emphasize the good job they are doing as guardians of health in these Consumer Confidence reports.

## Sample Drinking Water Consumer Confidence Report

The following is a representation of a drinking water consumer confidence report.

The Easy Rest Motel and Apartments
Drinking Water Consumer Confidence Report
For 2005

The Easy Rest Motel and Apartments has prepared the following report to provide information to you, the consumer, on the quality of our drinking water. Included within this report is general health information, water quality test results, how to participate in decisions concerning your drinking water and water system contacts.

The Easy Rest Motel and Apartments supplies water to its customers from two drilled wells located on the property. Water from the wells is pumped to three hydropnuematic pressure tanks, and then to a cartridge filter, the water is then split through three ion-exchange softeners before distribution. The aquifer that supplies drinking water to Easy Rest Motel and Apartments has a high susceptibility to contamination, due to the sensitive nature of the aquifer in which the drinking water wells are located and the existing potential contaminant sources identified. This does not mean that this well field will become contaminated, only that conditions are such that the groundwater could be impacted by potential contaminant sources. Future contamination may be avoided by implementing protective measures.

The sources of drinking water both tap water and bottled water includes 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 include: (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife; (B) 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; (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses; (D) 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 storm water runoff, and septic systems; (E) radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, USEPA 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 The EPA requires regular sampling to ensure drinking water safety. The Easy Rest Motel and Apartments conducted sampling for the following contaminants during 2001-2005. Samples were collected for a total of 28 different contaminants most of which were not detected in the Easy Rest Motel and Aprartments water supply. The Ohio EPA requires us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though accurate, are more than one year old.

During the month of December 2005, Easy Rest Motel and Apartments failed to Monitor and report Synthetic organic compounds (SOC's). These samples were collected on February 4, 2006, which indicated that all levels are below the Environmental Protection Agency allowable limit.

*Steps have been taken to ensure that all sampling will be conducted as required by enacting a more comprehensive management plan. This plan assigns responsibilities for sampling and contains contingency measure if the assigned staff is absent.*

Listed below is information on those contaminants that were found in the Easy Rest Motel and Apartments drinking water.

| Contaminants (Units) MCLG | | MCL Level ViolationFound | | Range of Detections | | Sample Year | Typical Source of Contaminants |
|---|---|---|---|---|---|---|---|
| Inorganic Contaminants | | | | | | | |
| Fluoride (ppm) | 4 | 4 | 0.94 | NA | No | 2002 | Erosion of natural deposits; Water additive promoting strong teeth; Discharge from fertilizer and aluminum factories. |
| Copper (ppb) | 1.3 | AL=1.3 | 796 | 263-937 | No | 2005 | Corrosion of household plumbing. |
| Lead (ppb) | 0 | AL=15 | *<5.0* | *<5.0-<5.0* | No | 2005 | Corrosion of household plumbing systems. |
| Arsenic* | 50 | 10 | 17.9 | 0-17.9 | No | 2005 | Erosion of natural deposits |

*"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." 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 Environmental Protection Agency's Safe Drinking Water Hotline (1 -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 infection. 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 microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

For more information on your drinking water contact the Easy Rest Motel and Apartments manager's office at (555) 555-1234.

Definitions of some terms contained within this report.

Maximum Contaminant Level Goal (MCLG): 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.

Maximum Contaminant level (MCL): The highest level of contaminant that is allowed in drinking water. MCLs are set as close to the MCLG's as feasible using the best available treatment technology.

Parts per Million (ppm) or Milligrams per Liter (mg/L) are units of measure for concentration of a contaminant. A part per million corresponds to one second in a little over 11.5 days.

Parts per Billion (ppb) or Micrograms per Liter (gIL) are units of measure for concentration of a contaminant. A part per billion corresponds to one second in 31.7 years.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level (MRDL): The highest residual disinfectant level allowed.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of residual disinfectant below which there is no known or expected risk to health.