

# System Sampling Plan

## Example XXXXXX XXXXX Community Water System

### System Information

<b>System Name</b>	Example XXXXXX XXXXX Community Water System.
<b>System Classification</b>	Example XXXXXX XXXXX system is a Community Water System.
<b>ID #</b>	State System ID: 1111111111
<b>Source Type</b>	The Example XXXXXX XXXXX System is supplied by two separate groundwater wells, named wells #1 (Idaho ID AET030) and #2 (Idaho ID AET029).
<b>Population Served</b>	Example XXXXXX XXXXX Community System serves approximately 80 persons.
<b>Service Connection</b>	The Example XXXXXX XXXXX Community System presently has approximately 19 residential and 3 facility connections.
<b>Daily Production</b>	Typical production at Example XXXXXX XXXXX is approximately 10,000 gallons per day.
<b>Introduction</b>	Example XXXXXX XXXXX Community Water System serves all residents in the upper and lower neighborhoods of the Community.
<b>Source</b>	The Example XXXXXX XXXXX Community system is supplied by two wells located on the site. Wells are relatively shallow (50-60 feet) in gravelly soils with high static levels (6-20 feet) affected by a high, variable water table and seasonal conditions.
<b>Treatment - Disinfection</b>	Water is dosed with sodium hypochlorite solution via metering pumps as it is pumped to the reservoir.
<b>Treatment - Corrosion Control</b>	To control corrosion and thus meet the lead/copper requirements, the water system is dosed with a solution of soda ash via a metering pump as the water is pumped to the reservoir.
<b>Storage: Reservoirs</b>	The 140,000 gallon concrete standpipe reservoir shows some external evidence of effervescence and seepage and has recently been repaired. A replacement reservoir is planned.
<b>Special Note:</b>	System pressures were reportedly quite low: 28-35 psi. This may be related to the reservoir conditions and/or operating levels. Action to identify the cause is being addressed.

## **Sample Site Identification Introduction**

There are seven separate SDWA sampling sites for the Example XXXXXX XXXXX CWS (Plus one O&M sampling sites at the pump house). The following procedures describe the process and criteria used to select the sample sites. The sampling requirements are for:

- Coliform Bacteria
- Chlorine Residual
- Nitrate
- Inorganics
- Organics
- Lead and Copper
- Radiologicals
- TTHM & HAA5

The design, operation, and growth of the system all influence the selection of sample sites. The following factors were considered during the development of this sampling plan:

### **Flow through the system**

Ground water flows from the individual wells directly to the main transmission/distribution lines. Treatment and metering take place at the pump house adjacent to the reservoir.

### **Piping System**

Information about the construction materials, sizes, and locations of the distribution system piping is available on the system prints, and/or the O&M Manual.

### **Well Fields**

There are six wells within the community. The two main wells (Well #1 and #2) serve the Example XXXXXX XXXXX CWS. Well #1 east of the Community Building parking lot and approximately 150 feet north of the storage tank. Well #2 is located on the south-east corner of the property and within 50 feet of the flood plain. In 2003 this well was flooded. Both wells are within 110 feet of drain fields. A well head protection plan has been prepared. Well #2 became contaminated as a result of the 2003 flood. Plans are currently underway to drill a replacement well up gradient from the flood plain. In addition, Well #1 is within 25 feet of a drainage ditch which collects water from the community services parking lot.

A third well, which appears to be hand dug is used to supply water to the community center. However, it is reported that this water is not used for drinking.

### **Well Control**

The operator should refer to the Example XXXXXX XXXXXX Water System O&M Manual, if available, for instructions on producing flow from specific wells, or combined well flows.

## Sample Sites

The following SDWA sample sites have been established for Example XXXXXX XXXXX CWS.

Site #	Site	Why Selected
S-01	Pump house raw water sample tap	Accessibility. Provides good representation of source water.
S-01.1*	Well #1 - Raw Water - sample tap in pump house	Accessibility. Provides good representation of Well #1 source water.
S-01.2*	Well #2 - Raw Water - sample tap in pump house	Accessibility. Provides good representation of Well #2 source water.
S-02	Pump house finished water sample tap	Accessibility to finished water at the point just down stream of treatment.
S-02.1*	Well #1 - Finished Water - sample tap in pump house	Accessibility to Well #1 finished water at the point just down stream of treatment.
S-02.2*	Well #2 - Finished Water - sample tap in pump house	Accessibility to Well #2 finished water at the point just down stream of treatment.
S-03	Community Service Bldg. Kitchen.	Accessibility. Provides good representation of important food preparation area and system. (lead/copper) Identified as disinfection monitoring point as it is early in the distribution system.
S-04	Address Residence	Accessibility. Provides good representation of west side of system and housing. (lead/copper)
S-05	Address Residence	Accessibility. Provides good representation of north side of system and housing. (lead/copper)
S-06	Address Residence	Accessibility. Provides good representation of east side of system and housing. (lead/copper)
S-07	Address Residence	Accessibility. Provides good representation of south side of system and housing. (lead/copper)
S-08	Address Residence	Accessibility. Provides good representation of north side of system and housing. (lead/copper). Repeat sample site for S-07

**\*Note:** This system utilizes two wells. A well log has only been identified for one well. Thus, it cannot be assumed they are in the same aquifer. The result is they must be sampled separately. There is only one raw water and one finished water sample tap in the pump house. These taps are used to collect raw and finished water samples. The designations of S-01.1 and S-01.2, etc. are used to identify the specific well sampled from this sample tap. If at some time in the future, a well log is located for Well #2 and it is determined that it is located in the same aquifer as Well #1 a combined sample can be collected for the chemical and radiological samples. This will reduce the cost of sampling by one-half.

## Sample Sites by Constituent

Constituent	SDWA Site #
Chlorine Residual	S-02 daily for total chlorine. S-03 daily for free and total chlorine S-04, S-05, S-06, and S-07 for free chlorine on a rotating schedule.
Coliform	S-04 through S-07 for monthly sampling S-01.1 & S-01.2 for vulnerability analysis – monthly for 12 months
Inorganics	S-02*
Nitrate	S-02*
Organics (VOC/SOC)	S-02*
Lead and Copper	S-04 through S-08 (Use bathroom sink tap)
Radiologicals	S - 02*
TTHM & HAA5	S-07
Corrosion Control	Select O&M and Distribution sites according to BATT choice

**NOTE#1** For each SOURCE sample, (IOC, VOC, SOC, Nitrates, Radiologicals) the appropriate well pump must be activated before samples are collected. When source samples for one well have been completed, it should be turned off. Then the same procedure should be followed for each additional well that is used as a primary water source.

**Note#2** This system utilizes four wells. For each SOURCE sample, (IOC, VOC, SOC, Nitrates, Radiologicals) the samples can be collected from QBR-04. There is only one finished water sample tap. As samples are collected from this sample, the documentation must indicate the specific well that is being sampled. Sample sites ID numbers 04.1, 04.2, 04.3, and 04.4 are used to identify the specific well being sampled.

**Note #3** There is only one raw water sample tap in the pump house. The designations of QBR-05.01, 05.02, 05.03 and 05.4 are used to identify the specific well sampled from this sample tap. Vulnerability samples must be collected from this sample tap and the appropriate sample site location provided on the sample documentation.

## Sample Schedule by Constituent

### Free Chlorine Residual

Daily at S-02 and S-03 and one from S-04 through S-07 as noted below.

Site #	Location	Frequency
SS-02	Pump house finished water sample tap	Daily – total chlorine
SS-03	Community Service Bldg. Kitchen.	Daily - free & total
SS-04	Address & Residence	Monday & Friday
SS-05	Address & Residence	Tuesday
SS-06	Address & Residence	Wednesday & Saturday
SS-07	Address & Residence	Thursday & Sunday

### Coliform

Once each month a Coliform sample is to be collected from the designated sample site(s) for that month and delivered to the lab. This sample collection shall be done following coordination with the laboratory. The operator should make every effort to complete Coliform sampling as early in the month as possible, as well as early in the week. This allows for the possibility of re-sampling, should that be necessary. Voluntary extra Coliform samples should be taken at designated repeat sample sites.

In addition, 12 consecutively monthly Coliform samples should be obtained from the raw water sample tap, S-01.1 and S-01.2. These samples are required to determine the vulnerability of the source to surface water influence.

### Rotating Sample Sites

The Example XXXXXX XXXXX system has 6 possible Coliform sample sites: SS #1 through #6. Samples are to be collected from these sites as follows:

Site	Sampling Month
S-04	January
S-05	February
S-06	March
S-07	April
S-04	May
S-05	June
S-06	July
S-07	August
S-04	September
S-05	October
S-06	November

S-07 December

**Repeat Sample sites**

The following homes have been chosen for repeat Coliform sampling sites in the event of a positive sample:

- S-03: Upstream: S-02  
Downstream: S-04
- S-04: Upstream: S-03  
Downstream: S-05
- S-05: Upstream: S-04  
Downstream: S-06
- S-06: Upstream: S-05  
Downstream: S-07
- S-07: Upstream: S-06  
Downstream: S-08

**Vulnerability**

S-01.1 and S-01.2 once each month for 12 consecutive months to determine vulnerability to surface water influence.

**Inorganics**

Every 3 years at S-02

**Lead and Copper**

Every 3 years, one sample from each of the following: S-04, 05, 06, 07, 08 (use bathroom tap). *In addition, one set of samples must be collected during the first six months of operation of the corrosion control equipment and a second complete set of samples collected during the second six months of operation of the corrosion control equipment.*

**Corrosion Control**

To verify the operation of the corrosion control equipment pH and alkalinity should be monitored on the following schedule:

Site #	Location	Frequency
S-03	Community Service Bldg. Kitchen.	Monday
S-04	Address & Residence	Wednesday
S-06	Address & Residence	Friday
S-01	Pump house raw water sample tap	Monday, Wednesday and Friday
S-02	Pump house finished water sample tap	Monday, Wednesday and Friday

**Nitrate**

Annually, one sample from each well at S-01.1 and S-01.2

**Organics (VOCs/SOCs)**

Every 3 years at S-02\*

**Radiologicals**

Every 3 years at S-02\*

**\* NOTE (1)**

For each SOURCE sample, (IOC, VOC, SOC, Nitrates, Radiologicals) the appropriate well pump must be activated before samples are collected.

**Disinfection By-Products**

Every year in August at S-07

## Summary Sampling Plan: Example XXXXXX XXXXX System

Constituent	Site #	Sample Type	Frequency	Next Sample
Chlorine - Total	S-02	O & M	Daily	
Chlorine - Total & Free	S-03	SDWA	Daily	
Chlorine - Free	S-04 through S-07 (see schedule)	SDWA	Daily	
Coliform	S-04 through S-07 (see schedule)	SDWA	Monthly	1st week
Coliform	S-01.1 and S-01.2	SDWA	Monthly for 12 months	1 <sup>st</sup> week
IOCs	S-02*	SDWA	3 years	9/2006
Lead & Copper	S-04, 05, 06, 07, 08 (use bathroom sink tap)	SDWA	3 years	6/2006
Corrosion Control pH & Alkalinity	S-01 & S-02	O & M	Mon, Wed, and Friday	
Corrosion Control pH & Alkalinity	S-03, S-04 and S-06 (see schedule)	O & M	Mon, Wed, or Friday	
Radiologicals	S-02*	SDWA	3 years	05/2005
Nitrate	S-01*	SDWA	Annual	9/2004
VOCs/SOCs	S-02*	SDWA	3 years	12/2006
TTHM & HAA5	S-02	SDWA	Annual	August 2005

\* **NOTE:** For each SOURCE sample, (IOC, VOC, SOC, Nitrates, Radiologicals) the appropriate well pump must be activated before samples are collected. When source samples for one well have been completed, it should be turned off. Then the same procedure should be followed for each additional well that is used as a primary water source.

# Support Documents

## Contacts - Phone and Address

<b>State DEQ Office</b>	<b>XXXXXX</b>
<b>Regional Health Office</b>	<b>XXXXXX</b>
<b>IBOL</b>	<b>XXXXXX</b>
<b>Brown Environmental</b>	<b>XXXXXX</b>
<b>Electrician</b>	<b>XXXXXX</b>
<b>Operator</b>	<b>XXXXXX</b>
<b>System Manager</b>	<b>XXXXXX</b>
<b>Pump &amp; Maintenance Company</b>	<b>XXXXXX</b>
<b>Laboratory</b>	<b>XXXXXX</b>
<b>Chemical Supply Company</b>	<b>XXXXXX</b>

# Notification of Violation

## **MCL and other Violations**

Should there be a violation of a SDWA requirement the Utility will follow this approved procedure to notify its customers.

## **All Violations**

### **Hand-bill**

A copy of the written notification explaining the violation will be posted at the front door of the XXXXXX, the front door of the local \_\_\_\_\_, and the front door of the \_\_\_\_\_. This posting will be completed within 24 hours of the determination of the violation for violations with microorganisms, or within 30 days for other MCL violations, or within one year for treatment technique or reporting violations.

## **Mandatory Language**

The following EPA required language must appear in any handbill that describes a violation associated with any of these contaminants.

## **Specific Application**

### **Coliform Violation**

Examples of the public notification for Coliform violation are found in the appendix of this plan.

## **EPA Information**

Mandatory language for various MCL violations is found in the Appendix section of this plan.

## **Additional Information**

Additional examples and procedures associated with the public notification process.

# Violation Codes

From EPA

When a violation notice is received from DEQ, a set of documents will be received. One document similar to the one below will be included.

Regulated Contaminant Group	Period (in Months)	Last Sample Date	Next Sample Due Date	Violations Recorded	Comments
Microbial	1	10/20/2005	11/30/2005	2/1/2005-23-Microbial 11/1/2002-23-Microbial 12/1/2002-23-Microbial 2/1/2003-23-Microbial 4/1/2005-24-Microbial 8/1/2005-23-Microbial 9/1/2005-23-Microbial	
IOC's	36	9/30/2005 8/16/2005=Mercury: .003MG/L	8/31/2008		
Nitrite/Nitrate	3	8/16/2005	11/30/2005		
SOC's	36				
VOC's	36	7/31/2005	7/31/2008		
Lead/Copper Tap	36	3/4/2004 3/4/2004=Copper Tap: 53.1MG/L	3/31/2007		
Radionuclides	36		1/31/2005		
Arsenic	3	8/16/2005	8/31/2008		
Radium 228	36	9/11/2003	9/30/2006		
TTHM	3	8/16/2005	11/30/2005		
HAA5	3	10/31/2004			
Sanitary Survey	36	8/9/2000	8/31/2005		CWS ANTHC
Consumer Confidence Report	12	8/26/2005	7/1/2006	7/1/2005-71-CCR	
Surface Water Treatment Rule	Daily Turbidity and Chlorine Residual				
Monitoring Waiver in effect	Asbestos / Dioxin SOC/OOC 1/1/99-12/31/01(ADEC)				
Comments					
Violation Code Description	23-Monitoring, Routine Major (TCR) 24-Monitoring, Routine Minor (TCR) 71-CCR Complete Failure to Report				

There are several violations in this example. The violation for Microbial is dated on 2/1/2005 is followed by a two digit number, 23. From the table below we see this failure to monitor and is considered a major violation. The microbial violation dated 4/1/2005 is followed by a two digit number, 24. From the table below we see this is a failure to monitor but a minor violation. The letters TCR stand for Total Coliform Rule.

Code ID#	Description
01	MCL, Single Sample
02	MCL, Average
03	Monitoring, Regular
21	MCL, Acute (TCR)

22	MCL, Monthly (TCR)
23	Monitoring, Routine Major (TCR)
24	Monitoring, Routine Minor (TCR)
25	Monitoring, Repeat Major (TCR)
26	Monitoring, Repeat Minor (TCR)
36	Monitoring, Routine/Repeat (SWTR)
41	Treatment Technique (SWTR)
51	Initial Tap Sampling for Pb and Cu
52	Follow-up and Routine Tap Sampling
71	CCR, Complete Failure to Report

# PUBLIC NOTICE

ATTENTION ALL XXXXXXXXX WATER PROGRAM USERS

*TESTS SHOW PRESENCE OF FECAL COLIFORM/E. COLI BACTERIA*

BOIL ALL WATER USED FOR DRINKING OR COOKING

As a public water system, we are required to monitor our drinking water for various contaminants. Samples taken DATE OF TEST tested positive for fecal coliform or E-coli bacteria. This is a violation of state and federal drinking water standards requiring immediate attention.

**State and local health authorities recommend that consumers take the following precautions: (FILL THIS IN BASED ON DIRECTIONS from EPA)**

## **General Information**

The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms or E. coli is a serious health concern. Focal coliforms and E. coli are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes that distribute the water, and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue. These symptoms, however, are not just associated with disease causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and E. coli to reduce the risk of these adverse health effects. Under this standard, all drinking water samples must be free of these bacteria. Drinking water that meets this standard is associated with little or none of this risk and should be considered safe.

The bacterial contamination is a result of INSERT REASON FOR VIOLATION

The following steps are being taken to correct this problem: INSERT DESCRIPTION of STEPS YOU ARE TAKING

## **Contact**

For further information contact:

# PUBLIC NOTICE

ATTENTION ALL XXXXXXXX WATER/SEWER PROGRAM WATER USERS

## *TESTS SHOW HIGH LEVELS OF TOTAL COLIFORM BACTERIA*

As a public water system, we are required to monitor our drinking water for various contaminants. Samples taken on \_\_\_\_\_ (insert date of test) showed that total coliform bacteria were present in more samples than permitted under drinking water stand. This means we are in violation of drinking water standards because we have exceeded the maximum contaminant level for total coliform.

State and local health official recommend that you take the following precautions: EPA will provide the information for this section.

### **General Information**

The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water, however, generally is a result of a problem with water treatment, or the pipes that distribute the water, and indicates that the water may be contaminated with organisms that can cause disease.

Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice and any associated and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforce-able drinking water standard for total coliforms to reduce the risk of these adverse health effect Under this standard, no more than 5.0 percent of the samples collected during a month can contain these bacteria, except that systems collecting fewer than 40 samples/month that have one total coliform-positive sample per month are not violating the standard. Drinking water that meets this standard is usually not associated with a health risk from disease causing bacteria and should be considered safe.

The bacterial contamination is a result of Insert reason for the violation

The following steps are being taken to correct this problem: Insert information on the steps being taken

For further information contact:

## **Map**

To be added by XXXXXX Water/Sewer Program Manager.

# Approximate Lab Costs for SDWA Sampling

**Note:**

The following costs are based on the combined sampling requirements of all XXXXXX community water systems, including 7 wells and 34 lead/copper sites in 4 systems.

Based on year 2005 pricing, the following estimates are provided for planning and budget preparation purposes.

Test	Cost	Total
48 -Coliforms	\$20 per	\$960 per year
7 - Nitrates	\$25 per	\$175 per year
7-IOCs	\$250 per	\$1,750 per round
7-Organics	\$1200 per	\$8,400 per round
34-Lead/Copper	\$25 per	\$850 per round
7-Radiologicals	\$90 per	\$630 per round
1 - TTHM & HAA5	\$250 per	\$250 per round

**Note:**

These estimates do not include shipping, mailing, or operator time.

**Note:**

Annual laboratory costs for all **source** sampling may be calculated by referring to the Sample Summary section.

## Estimate of Monitoring Lab Expense through FY 2009

	FY 2006	FY 2007	FY 2008	FY 2009
Coliform	\$960	\$960	\$960	\$960
Vulnerability**	\$120	\$120		
Nitrate	\$175	\$175	\$175	\$175
IOCs		\$1650		
Lead & Copper	\$300			\$300
Radiologicals		\$540		
VOCs/SOCs	\$2250*	\$4500		\$2250
TTHM & HAA %	\$250	\$250	\$250	\$250
Total	\$3,685	\$6,961	\$1135	\$3,685

**\*Note:** The VOC/SOC samples for North Lapwai were due in 2003. This price is placed in this column under the assumption that the utility will sample this site in 2005.

**\*\*Note:** This cost is based on the assumption that 1/2 of these samples will be collected in 2005 and the remainder in 2006.