Operations and Maintenance

Sanitary Survey Field Guide

331-486 • 4/15/2024

Sanitary Surveys
Special Purpose Investigations
Technical Assistance
Well-Site Inspections

Information for Washington's Third-Party Sanitary Surveyors

Washington State Department of HEALTH

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Chapter 1: Introduction

1.0 Purpose

We developed this document as guidance for conducting sanitary surveys and special purpose investigations, providing technical assistance to small Group A public water systems, and conducting well site inspections in Washington.

A sanitary survey is an inspection of water system's facilities, operations, and records used to identify conditions that may present a public health risk. Sanitary surveys give water system owners and operators an opportunity to identify weaknesses in technical, financial, or managerial capacity. Sanitary surveys play a fundamental role in ensuring that public water systems provide safe and reliable drinking water to the people of Washington State.

Washington State drinking water rules require all Group A public drinking water systems to participate in a routine sanitary survey once every three or five years. The Washington State Department of Health Office of Drinking Water (ODW) conducts sanitary surveys. We also contract with some local health jurisdictions (LHJs) and private-contract surveyors to conduct surveys. We refer to LHJ staff and private contract surveyors we approved to conduct surveys as "third-party surveyors." This document may also refer to them as "the surveyor."

A **Special Purpose Investigation** (SPI) is an on-site inspection of public water system infrastructure and utility practices in response to a potential public health concern, regulatory violation, or consumer complaint. Third-party surveyors conduct many of the SPIs performed each year. A Level 2 assessment is another type of inspection related to the Revised Total Coliform Rule. See Chapter 11 for situations that trigger a Level 2 assessment.

Technical Assistance (TA) to small water systems is integral to a successful state drinking water program. We intend, for as long as federal funds are available for this work, to pay third-party sanitary surveyors to engage in TA activities with small system purveyors. In a typical year, we budget over $100,000 to pay third-party surveyors for providing TA in various areas that fall outside the scope of a sanitary survey or SPI. Our third-party surveyors are qualified to provide a broad array of assistance. They know what type of TA purveyors need and understand their capacity to use it.

An LHJ representative or third-party surveyor conducts well-site inspections as part of the source approval requirements for some new public water systems. LHJs and surveyors also conduct well-site inspections for unapproved public water systems.

In this document, we provide information and guidance on our expectations for our third-party sanitary survey program participants. We also discuss the *Third-Party Sanitary Survey Checklist* 331-487-F (Word), the regional office Third-Party SPI, Third-Party Well Site Inspection Checklists (check with our regional office for available SPI and Well Site Inspection checklists), Level 2 assessments, our Consolidated Contract with LHJs, and our Vendor Agreements with contract sanitary surveyors.

Third-party surveyors operate as our contractors and work on our behalf. As such, we are partially responsible for their work quality. We are committed to providing our survey partners

the training, field guidance, and administrative support they need to fulfill their tasks successfully.

We hold third-party surveyors accountable for completing and documenting sanitary surveys, SPIs, and well-site inspections properly. Follow the direction in this field guide for conducting inspections, completing the appropriate department-approved checklists, and communicating the results.

This field guide explains:

- Sanitary survey program administration.
- How to prepare for a sanitary survey.
- How to conduct a safe and effective sanitary survey.
- The significance of each sanitary survey checklist item.
- How to communicate sanitary survey findings to the water system and us.
- Follow-up with the water system on the sanitary survey findings.
- Expectations for Special Purpose Investigations.
- Expectations for providing technical assistance.
- Expectations for conducting well-site inspections.
- Expectations for completing Level 2 assessments.

1.1 Department of Health Contacts

Third-party surveyors with questions or concerns should contact us. See Table 1. Find contact information for LHJ programs online.

Table 1

Office of Drinking Water Regional Offices

Eastern Regional Office	Serving
Mark Steward Direct: 509-329-2136 Office: 509-329-2100 Fax: 509-329-2104 TDD Relay: 1-800-833-6388	Adams, Asotin, Benton, Chelan, Columbia, Douglas, Franklin, Ferry, Garfield, Grant, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman, and Yakima counties.
Northwest Regional Office	**Serving**
Bethany Brunny, MPH Direct: 564-233-8721 Office: 253-395-6750 Fax: 253-395-6760 TDD Relay: 1-800-833-6388	Island, King, Pierce, San Juan, Skagit, Snohomish, and Whatcom counties.
Southwest Regional Office	**Serving**
Denise Miles Direct: 360-584-7425 Office: 360-236-3030 Fax: 360-236-3029 TDD Relay: 1-800-833-6388	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Kitsap, Lewis, Mason, Pacific, Skamania, Thurston, and Wahkiakum counties.

Chapter 2: Sanitary Survey Program Administration

Chapter 2 covers survey frequency and survey assignment criteria.

2.0 Survey Frequency

Below is the frequency of required sanitary surveys for **Group A** public water systems (WAC 246-290-416).

A. **All noncommunity water systems**—once every five years.
B. **Community water systems supplied by surface water or groundwater under the direct influence of surface water**—at least once every three years. In some system-specific circumstances, we may allow a reduced survey frequency of once every five years.
C. **All other Group A community water systems**— once every three years. If a system meets one of the following criteria, it may be surveyed once every five years:

    i. Provides at least 4-log virus treatment before or at the first customer for all its groundwater sources (using inactivation, removal, or our approved combination of 4-log inactivation and removal) and performs compliance monitoring for virus treatment.

    ii. Since the last sanitary survey, the system meets all of the following conditions:
        a. Has no total coliform or *E. coli* maximum contaminant level (MCL) violations;
        b. Has no more than one total coliform monitoring violation;
        c. Has no unresolved significant deficiencies from the current sanitary survey;
        d. Has not failed to conduct a required Level 1 or Level 2 assessment; and
        e. Has not failed to complete corrective actions prescribed in a completed Level 1 or Level 2 assessment.

The flow chart in Figure 1 (next page) shows how and when we apply these criteria.

2.1 Survey Assignment Criteria

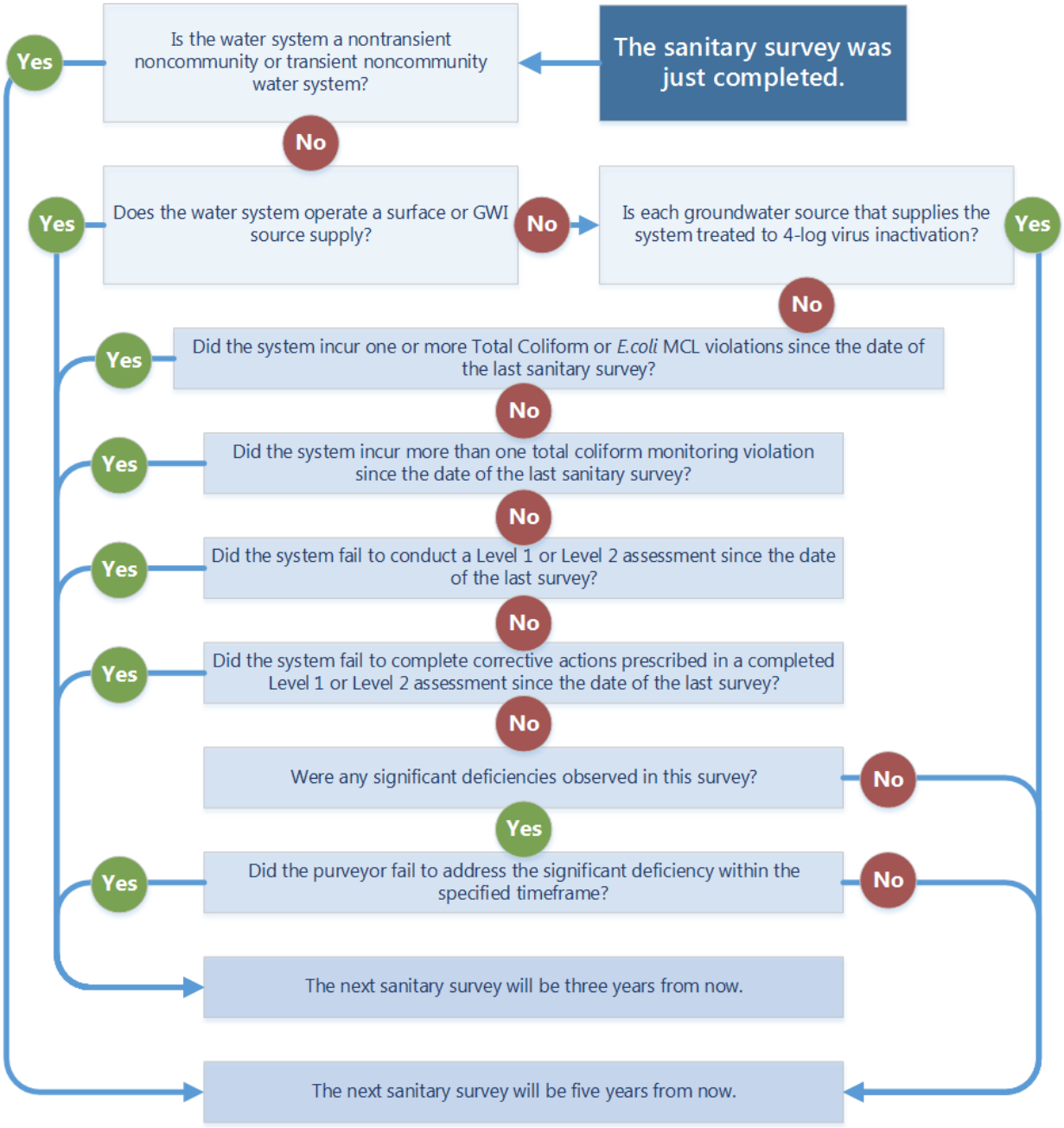
Near the end of each year, we determine which public water systems require surveys in the coming year. We usually assign non-community and small community system surveys to third-party surveyors. However, we may choose to survey some of these systems ourselves based on specific circumstances, such as use of complex treatment, time passed since our staff last visited the water system, water system compliance status, regional priorities, and the availability of a qualified and experienced third party surveyor.

We negotiate assignments with third-party surveyors as part of the Consolidated Contract or Vendor Agreement scope of work.

2.2 Joint Surveys

Periodically, we may ask to participate in a third-party survey to assess the surveyor's adherence to these guidelines. We will not be responsible for helping to prepare for or document the joint survey. Our goal is to participate in at least one joint survey with each third-party surveyor every year.

Figure 1


The sanitary survey was just completed.
Is the water system a nontransient noncommunity or transient noncommunity water system?
Yes
No
Does the water system operate a surface or GWI source supply?
Yes
No
Is each groundwater source that supplies the system treated to 4-log virus inactivation?
Yes
No
Did the system incur one or more Total Coliform or E.coli MCL violations since the date of the last sanitary survey?
Yes
No
Did the system incur more than one total coliform monitoring violation since the date of the last sanitary survey?
Yes
No
Did the system fail to conduct a Level 1 or Level 2 assessment since the date of the last survey?
Yes
No
Did the system fail to complete corrective actions prescribed in a completed Level 1 or Level 2 assessment since the date of the last survey?
Yes
No
Were any significant deficiencies observed in this survey?
No
Yes
Did the purveyor fail to address the significant deficiency within the specified timeframe?
Yes
No
The next sanitary survey will be three years from now.
The next sanitary survey will be five years from now.

Chapter 3: Preparing to Conduct a Sanitary Survey

Chapter 3 explains what a surveyor needs to do to prepare properly for each sanitary survey.

3.0 Preparation Leads to a Successful Survey

The surveyor leads the survey. Surveyors should research and plan each functional area of the survey. Advance planning enables you to shape events, build trust and respect, and create a more meaningful experience that goes beyond completing a checklist. (See Section 3.3)

Proper and thorough preparation for the sanitary survey creates the maximum amount of value to the water system and increases your level of professional satisfaction. No matter how experienced you are as a surveyor, you should **never** "wing it."

Stay alert to our survey program initiatives or focus areas. The survey program is an important avenue for direct in-person interaction with every public water system in the state. We may ask surveyors to assist in one-time or ongoing initiatives aimed at disseminating or collecting information during surveys of all or some types of water systems.

3.1 Scheduling Sanitary Surveys

3.1.1 When to Contact

Water system personnel may contact you before you contact them to schedule the survey. If they don't contact you, you should write, email, or call the system's main contact (listed on the Water Facilities Inventory) at least a month before the desired survey date and discuss a mutually-agreeable survey date and identify the people that should participate in the survey.

As part of your initial contact with the water system, advise the operator or owner to prepare for the survey. Mail them a letter, send an email, or call to let them know it's important for water system staff to assemble their water system records and make them available during the survey. In addition, you can help them prepare by providing a copy of the third-party sanitary survey checklist and their previous sanitary survey.

3.1.2 Who Should Attend

Make it clear that the certified operator, if there is one, must be present and an active participant during the sanitary survey. The minimum duties of a certified operator in responsible charge of a water system include cooperating in the sanitary survey (WAC 246-292-032). All community and non-transient non-community (NTNC) water systems must employ a certified operator. Some transient non-community (TNC) water systems must employ a certified operator. Go to our Sentry Internet webpage, follow the prompts to log in, enter the PWS ID#, and click on the "Operators" tab to obtain a list of the certified operator(s) for the system you will survey. The certified operator supports the technical capacity of the water system.

If the certified operator in responsible charge intends to send a surrogate to participate in the survey, confirm that the designated individual is also certified, has knowledge of how the water system operates and how it's maintained, has access to all applicable records and plans, and can speak for the certified operator in responsible charge. Inform us if you're told a certified operator—if one is required—doesn't intend to participate in the survey. **You should not perform the survey if you know a certified operator won't participate.**

In addition to participation by the operator, the most productive sanitary surveys are those that include the water system owner or representative of the governing board. When scheduling the survey request the system owner or governing board member participate in the survey. Explain the importance of bringing their knowledge of budget, policy, planning, and management to the survey, and the opportunity to deepen their knowledge of the condition of the water system, compliance status, and drinking water program priorities. If the owner or governing body is not available to attend the survey, the surveyor may attempt to set up a phone interview before or after the survey. This provides an opportunity to explain the purpose and scope of the survey, rather than leaving that task to the operator. Lasting benefits accrue when the owner, operator, and surveyor come together and participate in a survey.

If there is no certified operator (most TNC water systems), ask the owner if there is a Satellite Management Agency (SMA) assigned to help manage and operate the system. If so, let the owner know that you intend to invite a representative from the SMA to the survey. Otherwise, ask that the individual most knowledgeable of the water system participate in the survey.

3.1.3 How to Prepare the Water System for the Survey

Remind the operator (or owner if there is no operator) to conduct a self-survey of the water system before the scheduled survey.

Ask the purveyor to make the following information available at the time of the survey.

1. Current water system plan or small water system management program.
2. Cross-connection control ordinance, name of cross-connection control specialist, and cross-connection control assembly installation and testing records.
3. Photographs of system components you as the surveyor may not be able to access. For example, photos depicting the condition of the reservoir roof, hatch, vent, and overflow.
4. Current water-quality monitoring summary.
5. Well log(s).
6. The last three monthly reports of daily chlorine residual measurements.
7. Correspondence related to the previous sanitary survey.
8. Summary of power outages and water outages over the last two years.
9. A copy of the current budget, revenue forecast, and water rate structure.

3.1.4 Survey Time in the Field

You should schedule at least three hours of field time for community water system surveys, and at least 90 minutes of field time for non-community water system surveys. When conducting multiple surveys of systems managed and owned by different individuals you should build some flexibility into your schedule between surveys. If you must cancel or you know you'll be late for a survey, call the water system to explain your circumstances as soon as possible.

3.1.5 If the Water System Refuses to Schedule a Survey

Record the background, lack of response, or reasons for refusal and then contact our regional office. We will try to convince the system's main contact to cooperate in scheduling a survey. A water system's failure to cooperate in scheduling a sanitary survey is a rule violation subject to enforcement.

We will not consider reassigning a survey to placate a system's concern over the designated third-party surveyor's fee. If asked to reassign the survey to our regional office, explain that you

do not have the authority to do that, and a water system's refusal to schedule the survey with you will trigger active compliance by us to assure completion of the survey as originally assigned to your local health office. If the water system cites a reason other than fees for seeking reassignment of the survey to us, consult with your regional office. We will work the issue through our office and advise how you should proceed with scheduling the survey.

3.2 Preparing for a Sanitary Survey

Review the following before conducting a sanitary survey.

- Previous sanitary survey report.
- Sanitary Survey Pre-Survey Data Packet.
- Water Quality Monitoring Schedule (WQMS)
- Documents from our regional office (request via email).

3.2.1 Previous sanitary survey cover letter and checklist

Each sanitary survey is an event in a progressive process of improvement. This year's survey builds on previous surveys. When you review the previous sanitary survey cover letter and checklist, you will get important history about deficiencies and recommended practices, and be able to establish the direction and rate of change occurring in the water system's management and operation. Your survey will be much more effective if you know the findings and recommendations of the previous survey.

It is important that you perform a thorough survey. Don't rely on data collected during previous surveys. Things can change significantly between surveys.

3.2.2 Sanitary Survey Pre-Survey Data Packet

You can get the pre-survey data packet from our Sentry Internet. The data packet includes detailed information on:

- Water quality.
- Compliance.
- Source.
- Treatment plant.
- Operator certification.
- Coliform monitoring locations

3.2.2.1 Water quality sampling history

The pre-survey data packet is rich with water quality information. When reviewing water quality test results and sample locations, look for year-over-year trends or patterns (nitrate, coliform), and how these changes coincide with other events (rainfall, construction, source usage, aquifer level).

3.2.2.2 Compliance history

You should review the compliance section of the pre-survey data packet. Plan to spend time discussing the circumstances surrounding past noncompliance, especially in the following program areas.

- **Water quality monitoring:** Noncompliance with monitoring is a sign of failure. It could signify the operator failed to take the required samples, despite our notices and offers of

technical assistance. It could also indicate a failed relationship between the operator (who knows of the need to take the samples) and the owner (who refuses to pay for the sampling). You should inquire about the reasons for noncompliance and note the water system's response in the survey cover letter or checklist.

- **Sanitary survey:** Noncompliance with sanitary surveys could mean the operator or owner rejects the importance of the survey findings and has obvious implications for the survey you are about to perform. You should ask about the reasons for noncompliance with the previous survey and note the water system's response in the survey cover letter or checklist.
- **Install treatment:** Noncompliance in this area may reflect poor financial condition or a lack of concern about delivering safe and reliable drinking water. These problems may be the result of poor water system management, poor communication between the owner and operator or owner and consumers, or a general lack of understanding. You should inquire about the reasons for noncompliance and note the water system's response in the survey cover letter or checklist.

3.2.2.3 Source and Treatment Plant

The source and treatment information in the pre-survey data packet is a partial extract of source information from the WFI and treatment plant information from Sentry.

3.2.2.4 Operator Certification

The operator certification information in the pre-survey data packet identifies the certified operator of record (if the system requires a certified operator). If the operator is not present at the survey despite assurances he or she would be when you scheduled the survey, inquire and record the reasons given for his or her absence in the survey cover letter or checklist. We will forward this information to our operator certification program.

3.2.3 Documents from our Regional Office

Upon request, our regional office may provide system-specific information that you can review with the water system during the survey, such as:

- Information we received from the water system confirming correction of past significant deficiencies and significant findings.
- Complaint records.
- Chlorination reports.
- Water Facilities Inventory (WFI).
- Current and historical projects list.
- Consumer confidence report.

3.2.3.1 Complaints

We may give you a report from our complaints database. If so, review the background of each complaint with the purveyor. Record any significant change in operating procedures or improvement to facilities implemented in response to a complaint, under comments in Part N.

3.2.3.2 Chlorination Reports

Recent chlorination reports contain valuable information about the reported level and reliability of treatment. We require each water system to maintain its own set of chlorination reports so, even if you do not receive a copy from us, you should ask the water system to review the last 12

months of chlorination reports. Go over them with the water system and discuss any periods of missed monitoring and inadequate residual levels.

3.2.3.3 Water Facilities Inventory (WFI)

It is essential during any sanitary survey to review and confirm or correct the accuracy of WFI information. See Appendix B to view a sample WFI form and the instructions we give water systems when completing or updating the form. You should understand the information we request in the WFI before discussing the accuracy of the form with the water system.

At a minimum, you should ask the water system to confirm the accuracy of these WFI entries.

- Contact information, especially phone number and email address.
- Actual production capacity of the well (or flow capacity through an intertie, if any).
- Treatment information when reviewing the detailed information from the source and treatment sections of the pre-survey data packet.
- Whether the source is equipped with a meter.
- Designation of the source use (permanent, seasonal, emergency).
- Designation of source status (active, inactive).
- Depth to the first open interval (first perforation in the casing; top of well screen).
- Number of connections (all types).

Clearly mark corrections directly on the WFI and explain the reason for the change. If no corrections are required, mark the box, "Update—no change." The purveyor or the surveyor needs to sign and date the corrected WFI. Submit a copy of the corrected, signed, and dated WFI to us with your completed sanitary survey checklist.

Changes to the number and type of population served, the number or type of connections served, source use, or treatment may affect the system classification, approval status, water quality monitoring requirements, or operator certification requirements. Contact our regional office if you have any questions.

3.2.3.4 Water Quality Monitoring Schedule

We generate Water Quality Monitoring Schedule (WQMS) reports to help community and non-transient non-community water systems understand their future water quality monitoring requirements. This document helps you discuss future water quality sampling requirements with the water system. You can print a copy of the current WQMS online.

3.2.3.5 Current and Historic Projects List

Surveyors often discover changes to a system's facilities since the last survey. To help understand whether we approved these changes, the surveyor may request a copy of the approved projects list from our regional office. Surveyors should note any construction and use of unapproved infrastructure, such as a new well, treatment system, tank, booster pumps, or expansion of the service area in the comments section of the appropriate part of the survey checklist.

3.2.3.6 Consumer Confidence Report

Community water systems are required to prepare and distribute a Consumer Confidence Report (CCR) each year. Find required information on our Checklist for Completing a Consumer Confidence Report. The surveyor may request a copy of the CCR from our regional office.

Surveyors who choose to review the CCR should note their comments about it in Part N of the checklist.

3.3 Planning a Survey for a Consecutive Water System

A number of Group A public water systems buy all their water from another public water system. We refer to these systems as "consecutive systems." They don't usually provide any treatment to the water they buy.

The scope of a consecutive water system survey should focus on:

- Water quality sampling applicable to such systems (e.g., coliform, lead and copper, asbestos, chlorine residual, disinfection byproducts).
- Operator certification requirements and responsibilities.
- Review of the WFI for accuracy.
- Conduct a reservoir inspection (if applicable).
- Discuss the existence of any emergency, auxiliary, nonpotable, or any other type of additional supply not listed on the WFI and physically connected or might become physically connected to the system during times of the year or because of an emergency.
- Coliform monitoring plan review.
- Cross connection control plan and implementation review.
- Understand and review the intertie agreement, and determine if the timeframe or water quantities in the agreement represent a reliability concern.
- Financial capacity.
- Distribution system condition assessment and planning for pipeline replacement.

3.4 Tools and Equipment

To meet our expectations for a thorough sanitary survey, you will need the following tools.

- Camera and spare batteries.
- Sanitary survey checklist.
- Flashlight.
- Mirror to view under things.
- Long, thin screwdriver or other device capable of safely probing surfaces and crevices.
- Cell phone.
- Free chlorine residual field test kit.
- One-hundred-foot tape measure.
- Earplugs, gloves, and eye protection (see Section 4.6 Safety).

Chapter 4: Conducting a Sanitary Survey

Chapter 4 explains how to make the most of the time you spend with a water system and reduce the risk of injury while conducting a sanitary survey.

4.0 Making the Most of Every Moment

Engage in active listening during every part of the survey. If something isn't clear, ask clarifying questions until you understand.

You can gather a wealth of information from casual conversation when moving between office and field sites or during breaks in the survey. Ask about the operator's experience with this utility and other utilities, experiences dealing with emergencies or health advisories, motivation (what gives him or her pride at work?) and time, knowledge, resource, or management support limitations.

Throughout the survey, seek to understand the following. Write your thoughts down and share them with us.

- The operator's relationship with the governing body.
- The operator's level of awareness that—in addition to running the daily operation of a water utility—their decisions and actions influence the citizens' health and livelihood and the value of their homes and businesses.
- What the operator needs or wants from health officials that will enable him or her to do a better job.

Bring business cards. After their surveys, water system personnel want to know who the surveyor was and how to contact them directly.

4.1 Survey Objectives

Tell (or remind) the water system representatives what you came to accomplish. This is a very important initial step in the survey process. The stated survey objectives should be to:

- Identify issues that threaten the safety and reliability of the drinking water supply.
- Understand the operation of the water system, its capabilities, weaknesses, and current condition.
- Understand the water system's challenges, the owner's or operator's commitment level, and how prepared they are to face those challenges.
- Identify gaps between what should be and what is, and understand the role health officials can play in closing those gaps.

Ask what the operator wants to see as an outcome from the survey and include this input in the survey objectives.

4.2 Surveyor Behavior

Conduct every aspect of the survey in an efficient, effective, and professional manner. Even if an owner or operator confronts you, remain calm and nonconfrontational. If you need to see evidence of a statement the owner or operator makes, don't hesitate to ask for the information in a polite manner that doesn't challenge their honesty. Sometimes a smile and a statement like, "I trust you, but my job here today is to verify information," will carry the moment.

4.3 Identifying Safety Hazards

You should ask about potential safety hazards at the start of the survey and then discuss ways to mitigate or avoid those dangers while accomplishing the survey goals (see Section 4.6).

4.4 Office Time

It is important to spend office time with the operator (and owner or governing board member, if present) before and after the field inspection. Try to avoid conducting pre- and post-field work meetings in a vehicle or outdoors. It is important to convey the importance of the conversation you are having; it deserves their full attention. If they don't have an office or other private space to meet in, suggest meeting in a suitable public building, such as a café or convenience store with public seating or a meeting room at the town hall or public library.

During a sit-down meeting **before** the field inspection:

- Review WFI data (See Section 3.3.3).
- Confirm availability of documents you asked them to assemble before the survey (See Section 3.1.1).
- Review deficiencies identified in the last survey. Discuss resolution and status.
- Review Checklist Part B: General water system description.
- Review Checklist Part C: Operations and management.
- Review Checklist Part J: Distribution system.
- Review Checklist Part K: Cross-connection control program review.
- Review Compliance review (see Section 3.3.2).
- Review regional office specific information (see Section 3.3.3).

Back in the office **after** completing the field inspection:

- Review Checklist Part L: Operator.
- Review Checklist Part M: Other.
- Review Checklist Part N: Field notes and safety concerns.
- Review any significant deficiencies or significant findings you observed during this survey and discuss the next steps.

Explain that we will review and confirm your written survey findings. We will assign a due date for the water system to correct any significant deficiencies or significant findings. If the owner or operator can correct a deficiency or finding before you submit your report to us, include a description of the completed work in your cover letter (see Section 5.6).

4.5 Field Time

Complete the following parts of the survey checklist with the operator during the field portion of the survey (and owner or governing board member, if present).

- Part D: Sources.
- Part E: Chlorination.
- Part F: Other treatment.
- Part G: Well pumps, booster pumps, and controls.

- Part H: Pressure tanks.
- Part I: Water storage tanks.

4.6 Safety

This section covers alternative ways to get important survey information in the field, while ensuring personal safety and protection. Your employer or insurance company may have its own guidance or requirements. If so, it supersedes the following information.

Field settings vary tremendously, and some physical settings are not safe to inspect fully. If the setting is not safe, or you believe it is not safe, do not go there. Safety is a serious consideration and must be a top priority for all surveyors. We will never criticize a surveyor who observes unsafe conditions that prevent them from completing a sanitary survey. Record safety concerns under comments in Part N.

If workplace safety concerns make important water system facilities unavailable for inspection, you are empowered to determine that the water system failed to provide for the unrestricted availability of all facilities and records at the time of the survey (see WAC 246-290-416 (2)(c)). If that occurs, we will send the water system written notice that it is in violation of state rule because it cannot be surveyed (WAC 246-290-416).

The Department of Labor and Industries (L&I) regulates workplace safety in our state. If you find unsafe conditions in the field, and you feel you have competent knowledge of basic safety standards, we encourage you to point out the safety hazards and refer the operator to L&I's consulting services. Personal safety is a fundamental job responsibility, and you must take it very seriously.

DO NOT ENTER a space if you have to wear a respirator to enter or it appears to be a confined space. Ask your employer about the definition of a confined space and their confined space protocols. If you encounter a confined space during an inspection, look for other ways to determine the condition of the facility. Other ways may include information from the water system, previous inspections, using a camera or flashlight to inspect the interior, or referring to design drawings. If you aren't sure whether an area is a confined space, call your supervisor. You should err on the side of caution.

Other ways to collect data when you can't proceed safely:

- Ask the operator to show you photos or videos taken in the last year showing the tank roof and sidewall penetrations are sealed; hatch sealed, in good condition and locked; vents screened properly; and overflow screened properly and with a proper air gap.
- If it's a confined space or you observe other unsafe workplace conditions, take photos of the area without entering the space.
- Ask the purveyor to hire a professionally trained or certified inspector to collect the information.
- Review tank cleaning photos and videos if water system performed the work within the last year.

If you find chemical safety hazards during a sanitary survey or field visit, use your best judgment. DO NOT ENTER if you can't do it safely. If you can't proceed, explain the reason to the operator.

The following will help you evaluate whether the area is safe for your work.

- Ask the operator about the chemicals being used (gas chlorine, powdered chlorine).
- Don't risk exposure to improperly stored, unmarked, or unknown chemicals.
- Ask the operator about hazards that require personal protective equipment (PPE) (PPE includes head, eye, face, hand, or foot protection.). If so,
  - Do you have the right PPE for the situation?
  - Were you trained how to use the equipment?
  - Do you know its limitations?

We don't expect surveyors to be safety experts, but we do expect surveyors to use common sense when preparing for and conducting a survey. For example:

- Wear appropriate clothing for the weather.
- Wear appropriate footgear. You may need to walk over rough terrain.
- Carry earplugs, gloves, and eye protection, so you have them if you need them.
- Practice safe ladder use.
- Maintain awareness of dogs, snakes, and spiders.
- Avoid areas infested with mouse feces and urine.
- Avoid contact with mechanical and electrical equipment.
- Stay clear of active construction sites.
- Avoid structures that appear unstable.
- If the operator or owner becomes threatening or aggressive, leave immediately.

4.7 Field Summation

- Before departing, you should sum up the survey by reviewing the following with the operator and owner or governing board representative.
- The objectives of the survey.
- Any significant deficiencies and significant findings you found and the water system's obligation to address them promptly.
- The survey fee and invoicing process. If your LHJ required payment in advance of the survey, this would not apply.
- We, or the LHJ, will send the completed checklist and cover letter documenting survey findings to the water system within 30 days.

Resources available to answer questions or provide technical assistance related to the survey findings, such as our *Small Water System Program Management Guide* 331-134 (PDF).

Chapter 5: Third-Party Sanitary Survey Checklist

We designed the sanitary survey checklist for use when inspecting small groundwater systems without complicated treatment.

The checklist is not complete or exhaustive. We designed it to complement the expertise surveyors develop through training and experience. Use your knowledge of water system operation and sanitary principles to conduct a complete and effective sanitary survey of a drinking water system.

Appendix A details the meaning and significance of each sanitary survey checklist item. We explain each item on our sanitary survey checklist, why it's significant, and its connection to other drinking water issues. Surveyors can share the information in Appendix A with water system owners or operators.

5.0 Classifying Sanitary Survey Findings

The better you understand the reason and background of each checklist item, the greater the influence you will have on the water system. Most operators and owners want to do what's right and take their cues from health officials.

Expressing the public health significance of the checklist items during the sanitary survey increases the likelihood that water system officials will internalize the message. In turn, they will demonstrate the kind of sustained, independent action we want to see from the people who deliver drinking water to our families, friends, and neighbors.

Survey checklist items fall into one of six categories:

1. Significant deficiencies.
2. Significant findings.
3. Internal program referrals.
4. Observations.
5. Recommendations.
6. Informational.

Chapter 6 provides further guidance on writing survey findings in the survey cover letter.

5.1 Significant Deficiencies and Significant Findings

5.1.1 Definitions

Significant Deficiency includes, but is not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the state determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers (40 CFR 141.403(a)(4)). If left unaddressed, a significant deficiency directly creates a significant public health risk.

Significant Finding means:

a. A lack of access or information, which interferes with the surveyor's assessment into whether a Significant Deficiency actually exists; or

b. A defect or problem, which, if left unaddressed, indirectly creates a significant risk to the physical safety, security, or reliability of the public drinking water supply.

5.1.2 Significant Deficiencies

A significant deficiency is of great concern to us because it signifies an immediate or potential health risk to water system customers. Therefore, within 45 days after the date on the survey cover letter, water systems must correct significant deficiencies or send us a credible plan for correcting the deficiencies. We will track the status of each significant deficiency through to resolution. If a surveyor designates a problem as a significant deficiency, we apply active, progressive enforcement as necessary. This may include issuing a penalty for failure to comply.

We expect the purveyor to investigate, find, and fix any significant deficiencies as soon as possible **prior to the survey**. We may notify our Operator Certification and Training Section about significant deficiencies you find that we consider the result of operator negligence. The Operator Certification and Training Section may follow up with the operator in responsible charge and hold the operator accountable for the significant deficiency.

Checklist items in **highlighted and bold text** are "significant deficiencies." This list is exclusive. That means no other checklist items are significant deficiencies.

5.1.3 Significant Findings

A significant finding is a problem that imparts a serious but less direct public health threat than a significant deficiency. Water systems must correct significant findings or send us a credible plan for correction within the timeframe specified in the survey cover letter. The default is 45 days after the date on the survey cover letter. We will track the status of each significant finding through to resolution. If a surveyor designates a problem as a significant finding, we apply active, progressive enforcement as necessary. This may include issuing a penalty for failure to comply.

Checklist items in highlighted text (not bold) are "significant findings." This list is not exclusive. That means the surveyor may propose other checklist items or field observations not on the checklist as significant findings as appropriate.

You may see a problem in the field not designated as a significant finding on the checklist. If you believe the magnitude of the problem is such that we should track correction of the problem through to resolution, you can propose the problem as a significant finding in the comment section of Part N. After reviewing the circumstances you describe, our regional office will decide whether we should classify a problem as a significant finding.

For example, Part D (Sources) does not identify the following items as significant findings:

- Is the well house properly constructed and maintained?
- Is there evidence of rodent infestation?

However, if you believe the poor condition of the pump house and significant rodent infestation is a barrier to safe and reliable system operation, you may propose these items as significant findings under comments in Part N.

5.2 Internal Program Referrals

An "internal program referral" is a sanitary survey finding we believe we can best address by tapping into to expertise of a specific program area (such as our Surface Water Program for potential GWI). See the list of internal program referrals on the next page. These items are in *italic type* on the third party checklist.

If you identify an issue listed in *italic type* on the third-party checklist, our regional office will use your finding as the basis for referring the issue directly to our program specialist for action. Explain your concern to the purveyor, and explain that you will relay your concern to us. List your referral in the appropriate section of the cover letter, but do not direct the system to address these items as part of the post-sanitary survey correspondence. Instead, our program specialist will investigate the issue, likely consult with the water system, and issue a directive, if needed. If you believe any of these issues demand immediate attention, call our regional office during the survey for consultation.

The checklist might not identify a problem observed in the field as a referral. If you believe an ODW program specialist should investigate a problem to determine its significance, you should make a note of it in the comments section of Part N. Our regional office will review the information and determine the need for further investigation on our part.

Checklist Number	Checklist Question
18	*Is the source a potential GWI?*
41	*Does the operator routinely **batch** chlorinate the source, the distribution system, or the reservoir just before collecting routine or repeat coliform samples?*
51a	*Measure free chlorine at the CT compliance point.* If the measured value indicates inadequate treatment, refer it to DOH.
52	*Is the chlorine pump and its controls constructed and maintained to provide uninterrupted, reliable CT6 treatment?*
87	*Does the system provide adequate pressure throughout the distribution system?*
89	*Are there any air relief or vacuum relief valves subject to submersion?*
102	*Is the operator performing measurements and calibration of water treatment monitoring equipment consistent with manufacturer recommendations?*
103	*Is the operator using proper inputs to treatment plant operations reports, such as correct volume, peak flow rate, time, and making the proper calculations?*
104	*Does the operator sample water quality at the proper location?*
N/A	Is someone other than the certified operator in responsible charge carrying out the duties of the certified operator as outlined in regulation? **If yes, call our regional office immediately after the survey.**
N/A	Is the water system operating a primary contaminant treatment facility without appropriately certified personnel? **If yes, call our regional office immediately after the survey.**
N/A	Do you have any reason to suspect false or misleading reporting of water quality, treatment operations, status of previously identified significant deficiencies, or completion status of mandatory public notification? **If yes, call our regional office immediately after the survey.**

5.3 Observations

Observations directly reference a regulatory requirement. Observations do not include items classified as significant deficiencies or significant findings. Third-party surveyors should identify any unmet regulatory requirement as an observation in the sanitary survey follow-up correspondence to the water system. We don't track observations for compliance or give the system a deadline to address or correct the defect or problem. Instead, the surveyor's observations put the water system on notice that it currently does not meet a regulatory requirement.

5.4 Recommendations

Third-party surveyors may offer any recommendation they deem appropriate. Recommendations do not include items classified as significant deficiencies, significant findings, referrals, or observations.

5.5 If the Purveyor Refuses the Surveyor Entry

When the water system staff refuses to allow you to conduct the scheduled inspection or establishes conditions that limit the scope of the survey, you should:

- Remain nonconfrontational and professional.
- Inform them that you have authority to conduct the survey as our delegated representative (WAC 246-290-416).
- Obtain the reason for denial of access.
- Record the name and title of the individual denying access, the date, and the time.
- Try to obtain a formal statement from the water system to document specific issues. You should ask the facility representative to write a statement describing the issues, or write the statement and obtain the facility representative's signature.
- Conclude the survey.
- As soon as possible, after leaving the water system, call our regional office and report the details of the denial of access.

If a partial denial of access occurs, such as refusing to allow you to take photographs or enter certain buildings, you should continue with the survey and record the operator or owner's reasons for refusal. You should also inform them that such refusal might require a second survey **at an added expense to the water system**. We will follow-up with the purveyor.

5.6 Purveyor corrects Significant Deficiency or Significant Finding during the Survey

If you uncover a significant deficiency or significant finding and you witness the purveyor fixing the problem during the survey, you should:

- Document the finding in the checklist as it first appeared to you. For example, if there is a hole in the well casing, answer Item 23 "No."
- If the purveyor completes an adequate permanent repair, such as installing a bead of sealant around the hole and then strapping a metal band around the well casing to seal

it, document and describe the repair under comments in Part M. Be sure to reference the specific checklist item (Item 23 in this example).

- In the survey report, include the problem as first observed in the appropriate section of the report ("significant deficiency" or "significant finding" section), and repeat the description you wrote in Part M, which should clearly indicate that the fix is permanent and acceptable to you.

5.7 Submitting Completed Checklist and Photos

Surveyors should mark every applicable box in the checklist appropriately.

We recommend that you take photographs in a manner that works from the general to the specific. For example, take a set-up shot showing the general area of the violation, then take a close up of the violation itself. Take as many photographs as necessary to document your observations clearly.

To the extent possible, we want third-party surveyors to provide electronic photos of the following.

- **Each wellhead**: Show as much of the surrounding environment as possible. In the photo narrative, identify the well by source number, along with any other feature considered noteworthy.
- **Each treatment process**: Show as much of the treatment equipment and its relationship with other components as possible. In the photo narrative, identify the source to which the treatment is associated, along with any other feature considered noteworthy.
- **Each reservoir**: In the photo narrative, identify the reservoir by name, along with any other feature considered noteworthy.
- **Interior of each booster pump station**: In the photo narrative, identify the booster station by name, along with any other feature considered noteworthy.
- **Each significant deficiency** (wherever possible): In the photo narrative, identify the significant deficiency by its associated checklist item number.
- **Each significant finding** (whenever possible): In the photo narrative, identify the significant finding by its associated checklist item number.

Chapter 6: Communications

Chapter 6 covers the details of assigning surveys, interagency communications, and our expectation that a third party sanitary surveyor will communicate the results of a survey to the water system and us. Our regional offices will explain to you our submittal expectations for deliverables.

6.0 The Relationship Between Third-Party Surveyors and DOH

We pay third-party surveyors for sanitary surveys through the DOH-LHJ Consolidated Contract or vendor agreement. Before we assign surveys to an LHJ or private contract surveyor, we ensure there are sufficient funds to pay for them.

Surveyors perform sanitary surveys on our behalf. Within 30 days of the site visit, submit all deliverables that are stated in the contract (cover letter, third-party checklist, updated WFI, photos, and other materials). Properly classify all findings using the six categories discussed in Chapter 5.

We consider a survey complete when the third party satisfies requirements specified in their contract.

6.1 Transmitting Third-Party Surveyor Deliverables to Us

Each regional office processes hundreds of surveys each year. To efficiently review and approve the valuable information surveyors collect from each survey, we need complete information consistently formatted.

Submit an electronic version of the cover letter, completed checklist, photos, updated WFI, and other documentation to us using the correct format:

- **For the transmittal email.**

  The subject line should be THIRD PARTY SS INFO; <Name of the water system>; <PWS ID#>, <County>, <Date of the field visit>THIRD PARTY. If the cover letter identifies a significant deficiency or significant finding, the subject line should be PRIORITY: THIRD PARTY SS INFO; <Name of the water system>; <PWS ID#>, <County>, <Date of the field visit>THIRD PARTY

- **For the cover letter, follow this outline.**
  - Introduction.
  - Section on significant deficiencies (if none, do not include this section), followed by a standard statement about expectations for compliance.
  - Section on significant findings (if none, do not include), followed by a standard statement about expectations for compliance.
  - Section on referrals (if none, do not include), including your reason for the referral and a description of your concern.
  - Section on observations (if none, do not include).
  - Section on recommendations, compliments, kudos, and so on.

- **For transmitting photos.**
  - Paste electronic photos into a Word document.
  - Title each page of photos with the name of the water system, date of the photos, and name of the surveyor.
  - Describe each photo with enough detail to understand the point of the photograph. For example, to identify a problem, a facility, or the relationships between features in the photo.
- **Complete the checklist**.
  - Review the checklist, schematic, and sanitary control area (SCA) map for completeness.
  - Cross-reference the completed checklist with the cover letter, confirming all significant deficiencies, significant findings, and observations identified on the checklist have a corresponding narrative in the cover letter, and vice-versa.
- **Signed and dated WFI**
  - Include even if no changes are made.
- **Examples of other documentation.**
  - Missing water quality lab data and treatment plant reports.
  - Photos the operator provided.
  - Surveyor's notes.

6.2 Standard Language

Appendix A includes a standard response for every checklist item marked as a significant deficiency, significant finding, referral, or observation. Chapter 5 describes all six categories of sanitary survey findings. Each category has its own place in the sanitary survey cover letter.

Appendix A also identifies appropriate areas for stating your recommendations. Feel free to express your professional judgment in the manner you consider most appropriate for any of the items classified as "recommendations" on the *Third-Party Survey Checklist* 331-487-F (Word), or any other aspect not covered on the checklist.

The standard language provides clear direction to the water system on requirements. The standard language also helps us track whether the water system meets the requirement or expectation. All third-party surveyors should use the standard language wherever possible. Adjust the standard language, as needed, to fit the context of each survey finding. Familiarity with all Appendix A information associated with each checklist item will help you adjust the standard language for a particular situation.

6.3 Compliments and Kudos

Writing survey letters and reports is not just about pointing out the incorrect, inadequate, and unsafe. As a talented surveyor, you know the important role you play in reinforcing good behavior. We encourage you to freely express your positive impressions about the condition of facilities, the preparedness for the unexpected, and the obvious interest in improving operations and management, just to name a few. Cite specifics when offering a compliment on something done well.

We expect the operator, owner, or board of directors, and even some consumers, to read the survey cover letter. Usually, these people are very interested in what you have to say about their

water system. The way you present the information will affect the way they receive it. Seek balance, cite specifics, stand firm on what matters, and always connect things to the basic fact that the water this system delivers affects the health, and often the property values and economy, of those it serves.

Chapter 7: Post-Survey Follow-Up with Purveyors

Chapter 7 covers the role the surveyor plays in achieving desired sanitary survey program outcomes.

7.0 We Want Results, Not Endless Compliance Actions

As stated above, the objective of each sanitary survey is to:

- Identify issues that threaten the safety and reliability of the drinking water supply.
- Understand the water system operation, its capabilities, weaknesses, and current condition.
- Understand the water system's challenges, the owner or operator's commitment level, and their preparedness to face challenges effectively.
- Identify gaps between what should be and what is, and understand the role health officials can play in closing those gaps.

The ultimate goal of the Sanitary Survey Program is to help water system personnel improve their water systems and increase awareness of the need to find and fix problems *before* they result in unreliable or unsafe drinking water. In doing so, we create conditions for a sustained, high level of public health protection.

If a water system doesn't address a significant deficiency or significant finding, or it fails to cooperate in scheduling and participating in a sanitary survey, we use active enforcement to ensure compliance. That usually means progressive enforcement measures, beginning with a Notice of Violation and ending with an Order and Imposition of Penalty.

7.1 In Support of Excellence

Your approach to the survey can position water system staff to cooperate with any directives issued. Here's how you can promote even better survey outcomes.

- Remind the water system of its role in protecting public health.
- Remind the operator of their responsibility to conduct routine self-surveys to find and fix potential deficiencies. Don't wait until the next survey! Significant deficiencies and significant findings are preventable if the operator or owner acts with due diligence to proactively find and fix problems with the water system.
- When you identify problems in the field, describe what you saw, why it is a problem, and your insights on how to resolve the problem.
- Describe why the problem is important with respect to the delivery of safe and reliable drinking water.
- Describe what they can expect from us if a problem is a significant deficiency or significant finding. Let them know that we are a technical expert resource to help guide them in the delivery of safe and reliable drinking water.
- Ask them if they have any questions and take time to answer each one fully.
- Give the operator or owner helpful ODW publications on pertinent topics. If necessary, send the publication or email a link to them when you return to your office.

Give the water system your contact information and invite the owner and operator to call if they have questions later. Our third party surveyor contracts reimburse certain technical assistance activities, including follow up on deficiencies identified during sanitary surveys (see Chapter 9).

Chapter 8: Expectations for Special Purpose Investigations

Chapter 8 covers investigations prompted by an acute health risk trigger, such as an *E.coli* maximum contaminant level violation. These investigations, sometimes performed by LHJs, **must be complete within two working days of the incident/violation**. Sharing many similarities with a sanitary survey in scope and process, the investigation intends to pinpoint the potential (or actual) causes of the event after the fact, whereas the primary purpose of a sanitary survey is to prevent such an event in the first place.

8.0 SPI Definition

A Special Purpose Investigation (SPI) is an on-site inspection of public water system infrastructure and utility practices in response to a potential public health concern, regulatory violation, or consumer complaint, as defined in the third party contract. Third party surveyors conduct many of the SPIs performed each year. If asked to perform an SPI, check with our regional office for the appropriate SPI deliverables.

8.1 Need for an SPI

We determine when an SPI is needed. For example, we require an SPI in response to an *E. coli* maximum contaminant level violation, or other water quality, low-pressure, or health complaints.

8.2 Duties and Responsibilities

We will ask a third-party LHJ to perform certain SPIs. When we request the SPI, we will give you the information you need to prepare for and conduct the SPI. If you accept the assignment, we will notify the purveyor of the SPI requirement and your participation.

You will be responsible for scheduling the SPI with the purveyor, completing the fieldwork, and submitting by email a completed SPI deliverable within two working days of accepting the assignment. We expect the certified operator (if there is one) to participate in the SPI.

A complete SPI deliverable includes the following.

- A completed SPI deliverable (in some cases, our regional office may direct you to use a Level 2 assessment form. See Chapter 11).
- Electronic photos of each sanitary defect**.** In the photo narrative, identify the sanitary defect.
- Other documentation.

Submit completed SPI deliverables to us as follows.

- **Use the correct email address format.**

  The email subject line should be PRIORITY: THIRD PARTY SPI INFO; <Name of the water system>; <PWS ID#>, <County>, <Date of the field visit>THIRD PARTY

- **Use the following format and narrative for transmitting photos.**
  - Paste electronic photos into a Word document.
  - Title each page of photos with the name of the water system, date of the photos, and name of the surveyor.
  - Describe each photo with enough detail to understand the point of the photograph (for example, to identify a problem, a facility, or the relationships between features in the photo).
- **Include other documentation.**
  Include summary of findings, investigator's notes, any photos, and other documents the purveyor provided, such as public notice, sample results, measurements, operations log, and so on.

Review your investigation findings with the purveyor before concluding the SPI. If you uncover any significant deficiencies, significant findings, or other sanitary defects during your investigation, inform the purveyor that we will issue a directive and establish a deadline to address them. **We do not expect you to send any correspondence directly to the purveyor following the SPI.**

Chapter 9: Expectations for Technical Assistance

Chapter 9 covers Technical Assistance (TA) a third-party surveyor may provide to a water system.

9.0 What is Technical Assistance?

TA includes:

- Helping water system personnel to complete work that we required, requested, or advised them to do in order to meet applicable drinking water rules.
- Verifying that water system personnel completed the work we required, requested, or advised them to do.

We must pre-authorize any TA that a third party provides to a water system—if the third party expects payment. We encourage third party staff to identify and suggest TA activities that would improve the technical, financial, or managerial capacity of public water systems.

TA **does not include** well site inspections. See Chapter 10 for well-site inspection guidance.

TA activities include (but are not limited to) assistance in the following areas.

1. **Source.**
   a. Sanitary control area.
   b. Source approval.
   c. Susceptibility assessment.
2. **Treatment (Disinfection).**
   a. Chlorine residual monitoring.
   b. Chlorinator operation and maintenance.
3. **Distribution and Storage.**
   a. Cross connection control.
   b. Techniques for flushing and disinfecting lines after repairs or new construction.
   c. Updated distribution maps (schematic or scaled).
4. **Water system management and operation.**
   a. Seasonal start-up.
5. **Water quality monitoring, reporting and data verification.**
   a. Coliform monitoring plan.
   b. Nitrate monitoring and treatment.
   c. Source monitoring requirements.
   d. Field sampling for coliform, nitrate or chlorine residual.
6. **Existing System Approval (ESA).**
7. **Certified operator compliance.**
   a. Investigate complaints the DOH Regional Office receives.
   b. Help operator prepare for operator certification exam.
   c. Emergency response.
8. **Public notification activities.**
9. **Directly assisting water systems during emergencies with:**
   a. Public notification.
   b. Sampling.
   c. Flooding or wildfire.

d. Credible threats, vandalism, and tampering.

10. **Assist with one or more elements of a Small Water System Management Program (SWSMP) (WAC 246-291-105(4) (a-t).**
11. **Water Facilities Inventory (WFI).**
    a. WFI verification.
    b. System reclassification.
12. **Follow up to verify that the water system addressed or completed work as required.**
13. **Other activities and one-on-one training or consultation needed to help the water system achieve compliance with applicable drinking water rules and sound operations and management.**
    a. Systems moving from Group B to Group A.
    b. Newly discovered Group A water system.
    c. New owner of a noncommunity water system.
    d. New board member training.
14. **Coordinate activities among several purveyors as part of a consolidation effort.**
    a. Connecting a Group A system (usually a noncommunity system) to an existing Group A.
    b. Transfer ownership to an SMA.

9.1 When sanitary surveys or SPIs end and TA begins

A sanitary survey and SPI end when the surveyor and purveyor have observed, documented, discussed, and understood all relevant issues. TA begins when the surveyor engages in the process of assisting the purveyor in his/her duty to answer or address the significant deficiency, significant finding, or observation.

Our third-party surveyors are qualified to provide a broad array of assistance. They know what type of assistance purveyors need and understand their capacity to use it. TA for small water systems is integral to a successful state drinking water program.

9.2 Payment for Technical Assistance

To maintain budgetary control and ensure we address priority water systems and issues, we must pre-authorize payments for TA. We pay for TA according to the terms of the Consolidated Contract or Vendor Agreement. Surveyors expecting payment for providing technical assistance can get approval with a simple phone call or email to our regional office.

9.3 Duties and Responsibilities

If we ask you to provide TA, we will give you all the information you need to prepare and conduct the fieldwork.

Third-party surveyors must get our pre-approval for payment, schedule the TA, visit with the purveyor, complete the fieldwork, and email a completed TA report to us within **30 days** after completing the TA. We expect the certified operator (if there is one) to participate in all TA activities. Depending on the subject, the water system owner may be the principle audience for TA, and should participate, too.

A complete TA report includes:

- A memo describing the reasons for the TA, who participated, activities performed during TA, and follow-up actions expected by you and the purveyor. If you uncover any significant deficiencies or significant findings (see checklist), identify them in your memo.
- Electronic photos if appropriate**.**
- Other documentation.

Submit the completed TA report to us as follows.

- **Use the correct format and email address.**

  The email subject line should be THIRD PARTY TA INFO; <Name of the water system>; <PWS ID#>, <County>, <Date of the field visit>. If you identified any sanitary defects, place the word "PRIORITY" in the subject line.

- **Use the following format and narrative for transmitting photos.**
  - Paste electronic photos into a Word document.
  - Title each page of photos with the name of the water system, date of the photos, and name of the surveyor.
  - Describe each photo with enough detail to understand the point of the photograph. For example, to identify a problem, a facility, or the relationships between features in the photo.

- **Include other documentation.**

  Include work products or other documented outcomes from the technical assistance provided, any photos or other documents the purveyor provided, such as public notice, sample results, measurements, operations log, and so on.

Chapter 10: Well Site Inspections

Well site inspections are a tool that we use to protect public health. These well inspections proposed for use in a public water system is for ensuring that the wells have a sanitary control area that either, 1) contain no sources of contamination, or 2) contain sources of contamination that are satisfactorily mitigated. Protection of source water is the first step in the multiple-barrier approach that is set forth the drinking water regulations for protecting public health from waterborne illness.

The well site inspection should be done before the well is drilled; however, we recognize that some wells have already been drilled before the well site inspection and so our checklist includes questions related to existing wells. As part of source approval submittals for wells that are proposed to be used in a public water system, WAC 246-290-130(4)(e) requires a copy of the on-site inspection form completed by us or local health department representative. In Department of Ecology's rules on water wells, WAC 173-160-171(3)(c) says "all public water supply well locations shall be approved by the department of health or the local health jurisdiction or other department of health designee."

The core of the well site inspection is the checklist, *Public Water system Well Site Inspection Form* 331-638 (Word), used by our staff and third-party surveyors.

We expect the purveyor or consultant to provide a site map before or during the field visit. It's good practice to ask when scheduling the inspection that they provide a map. There is also a blank SCA map included with the checklist that you can use for additional notes during the well site inspection. When we do the well site inspection, the person requesting the inspection should send us a completed *Public Water system Well Site Inspection Form* 331-638 (Word), along with the relevant attachments.

When a third party-surveyor does a well site inspection, they should provide us with a copy of the follow-up letter, checklist, and maps. Template well site inspection letters are included at the end of this chapter. The water system's consultant also includes the documentation in the source approval package submitted to our office.

Chapter 11: Level 1 and Level 2 Assessments (Revised Total Coliform Rule)

Chapter 11 provides information about Level 1 and Level 2 assessments performed in response to certain Revised Total Coliform Rule (RTCR) violations or treatment technique triggers. A water system is responsible for submitting a completed assessment to us within 30 days of incurring a treatment technique trigger.

11.1 Assessment Triggers

A Level 1 assessment is required when a system has a Treatment Technique Trigger for any of the following events.

- A water system that collects fewer than 40 routine samples a month has two or more total coliform-positive samples in the same month.
- A water system that collects 40 or more routine samples has coliform-positive results in more than 5 percent of the routine and repeat samples.
- A water system fails to collect three repeat samples for every total coliform-positive routine sample.

A Level 2 assessment is required when a system has any of the following events.

- *E. coli* MCL violation.
- A second and all subsequent Treatment Technique Triggers within a rolling 12-month period.

You must conduct Level 1 and Level 2 assessments as soon as practical, and you must submit the completed assessment to us within 30 days of notification of the Treatment Technique Trigger.

11.2 Who May Conduct an Assessment?

Anyone familiar with the water system may conduct a Level 1 assessment.

Only these qualified individuals may perform a Level 2 assessment.

- Water Distribution Manager Level 2 or higher.
- A licensed professional engineer.
- A local health jurisdiction staff.
- ODW staff.

Relationship Between a Level 2 Assessment and an SPI

***E.coli* MCL violations trigger both an SPI and a Level 2 assessment.** We, or a designated third-party surveyor, will conduct SPIs for all *E.coli* MCL violations. The purpose of the SPI is to find and ensure defects in facilities that may have led to *E. coli* contamination are fixed. Significant deficiencies and significant findings identified in an SPI are actionable and tracked by us through resolution, independent of the utility's own assessment findings.

Level 2 assessment triggered by an *E.coli* MCL violation. A Level 2 assessment triggered by an *E.coli* MCL violation is like an SPI, but the scope is broader. Like an SPI, a Level 2 assessment is an evaluation intended to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and the likely reason the system incurred an *E. coli* MCL violation. A Level 2 assessment goes further by examining other operational practices. It documents actions completed and corrective action planned to address pathways of entry for microbial contamination into the distribution system, or failure, or imminent failure in a barrier that is already in place. A completed Level 2 assessment is a comprehensive examination of the water system and as such shares similarities with a sanitary survey.

Any system required to employ a WDM2 or above (including a system employing an SMA), must complete its own Level 2 assessment. The system should reference the findings of the third-party surveyor's SPI in its completed Level 2 assessment.

For small systems that do not employ a WDM2 or above (and does not employ an SMA), we may elect to expand the scope of the SPI so that it may serve to fulfill the Level 2 assessment requirement. In such cases, the scope of the SPI will be the same as the scope of a Level 2 assessment and the party conducting the SPI may use the Level 2 assessment template when conducting the SPI.

Level 2 assessments triggered without an *E.coli* MCL violation. Whenever a Level 2 assessment is triggered without an *E. coli* MCL violation, the water system will be held accountable to complete its own Level 2 assessment regardless of the level of its operator's certification.

We will reimburse third-party surveyors for conducting all SPIs, including those that also serve to satisfy the water system's Level 2 assessment.

The following documents provide more detail on conducting Level 1 and Level 2 assessments:

- Coliform Information Packet webpage.
- *Level 1 Assessment Guidance Template* 331-569 (Word).
- *RTCR Level 2 Assessment Guidance Template* 331-570 (Word).

Appendices

A. Sanitary Survey Checklist Reference.

B. WFI Form and WFI Instructions.

Appendix A: Sanitary Survey Checklist Reference

Item #	The checklist questions appear on this line. Each item has a corresponding page in Appendix A.
Guidance	Information designed to help the surveyor and the water system understand the context and meaning of the checklist item.
How to mark the checklist	This provides clarity on how to mark the item on the checklist.
Classification	The classification depends on how the surveyor marks the item on the checklist. The finding could be Significant Deficiency, Significant Finding, Referral, Observation, Recommendation, or Informational.
WAC reference	The Washington Administrative Code (WAC) requires all water systems to satisfy many items on the checklist. For these items, we list one or more WAC references here.
Publications	We list links to DOH publications relevant to each checklist item here. DOH has a database with hundreds of publications useful to purveyors. DOH encourages surveyors to use Appendix E to become familiar with the DOH publications associated with each checklist item, and provide relevant publications or their electronic links to water system staff during the survey or as a reference in the sanitary survey cover letter.
Webpage(s)	Links to DOH webpages relevant to the checklist item. DOH has many useful webpages. We encourage all surveyors to provide water systems with links to or printouts of webpages they might find beneficial.
Standard language	The standard language provides clear direction to the water system on what is required to address significant deficiencies and significant findings or expected to address observations. The standard language also enables DOH staff to track whether the purveyor addressed the significant deficiencies and significant findings. We encourage all surveyors to use the standard language wherever possible. You should adjust the standard language as needed according to the context of each survey finding.
Other notes for the sanitary surveyor	This box offers further background on the topic and may contain information you can use to adjust standard language for a particular situation, or to provide additional educational information to the purveyor. The surveyor also can use this box to record personal tips, lessons learned from other surveys, and important personal reminders.

Checklist Part A: Summary of Significant Deficiencies and Significant Findings

The text field for each line in the three sections of Part A is limited to 100 characters. We recommend you refer to the checklist item number for each significant deficiency and significant finding, and then refer to the survey cover letter for more information.

For example:

Significant deficiencies and significant findings identified during this sanitary survey.
Item 21. The wellhead is at risk of submergence. See cover letter.
Item 55. A water supply line is plumbed directly into a chemical tank. See cover letter.

We do not expect you to provide an explanation and give direction in Section A. You should include that information in the cover letter to the water system.

Checklist Part B: General Water System Description

Topics to Describe in the Comments Section of Part B

Provide a general description of the water system including changes, updates, connections, sources, storage, number of pressure zones, treatment, and control systems and alarms. Make corrections and updates to the purveyor's water facilities inventory form (WFI).

Checklist Part C: Operations and Management

Sanitary surveys are an important part of our state drinking water program now for decades. For most of this time, our focus was on visible infrastructure problems, such as a hole in the well casing, a rip in the reservoir vent screen, or a septic system too close to the well. Recently, we began to emphasize inquiry into operations and management issues:

- The way a small water system plans and allocates its resources.
- How prepared system staff are for the unexpected.
- How proactive system staff are at preventing conditions that may lead to an unsafe or unreliable drinking water supply.

This relatively new emphasis reflects the federal and state drinking water program priority to improve small water system technical, managerial, and financial capacity.

For many surveyors and small system operators and owners, an office discussion about budget, emergency response planning or the importance of recordkeeping in a sanitary survey will feel new and perhaps a bit awkward. After all, it's quite different than a clinical study of infrastructure and its capacity to keep contaminants out of the drinking water supply. Our goal is to move the boundary against unsafe or unreliable drinking water from the infrastructure itself to the people who make decisions about infrastructure.

We intend to use the operations and management (O&M) information surveyors collect to direct our small water system financial and managerial capacity efforts.

Topics to Describe in the Comments Section of Part C

- Document the general level and quality of the system's existing planning and management documents.
- Recommend further development or update to existing plans, practices, policies, and processes.
- Prioritize new planning, policy, and practices.
- Adequacy of budget and water rates to support needed and prudent expenditures.

Item 1	**Was the operator who is most knowledgeable about the system's day-to-day operations present for the survey?**
Guidance	We expect the system operator most knowledgeable about the system's day-to-day operations to accompany the surveyor during the inspection. • For systems required to have a certified operator (see below), the operator has a duty to be present during the sanitary survey. The Pre-Survey Data Packet will explain whether the system is required to have a certified operator. • If there is no certified operator (most TNC water systems), there may be a Satellite Management Agency (SMA) assigned to help manage and operate the system. The SMA operator should be present for the survey • For systems with no certified operator requirement and no SMA, whoever is most knowledgeable about the system's day-to-day operations should be present for the survey. • The survey notification letter (see Appendix A) sent to the purveyor should reference the expectation that the operator most knowledgeable about the system's day-to-day operations accompany the surveyor during the inspection.
How to mark the checklist	Mark "Yes" if the system operator who is most knowledgeable about the system's day-to-day operations was present for the survey.
Classification	Recommendation if marked "No" and the system is not required to have a certified operator. Observation if marked "No" and the system is required to have a certified operator.
WAC reference	WAC 246-292-032
Publications	*Requirements for Waterworks Operators* 331-466 (PDF)
Webpage(s)	Waterworks Operator Certification
Standard language	**For circumstance when no certified operator is required.** During future surveys we recommend the individual most knowledgeable about the system's day-to-day operations participate in the sanitary survey. **For circumstances when a certified operator in required.** At the time this survey was scheduled we had your commitment that the certified operator in responsible charge, or another certified operator with working knowledge of the water system, would attend the survey. The individual attending the survey did not possess knowledge nor have the proper certification, and so we were unable to fully accomplish the goals of this survey. We are forwarding a copy of this letter to DOH's certification program for their reference and follow-up to ensure compliance with WAC 246-292-032.
Other notes for the sanitary surveyor	**Certified Operators.** All community and nontransient noncommunity water systems must employ a certified operator. Some transient noncommunity water systems must employ a certified operator, including those that operate CT6/4-log virus inactivation treatment or other complex treatment and those that reach a level of significant noncompliance with one or more requirements of chapter 246-290 WAC. The Pre-Survey Data Packet will explain whether the system is required to have a certified operator. **SMA Operators.** If there is a satellite management agency (SMA) assigned to help manage and operate the system, you should invite a representative from the SMA to the survey (Field Guide section 3.2.1). **No certified operator and no SMA.** For systems with no certified operator requirement and no SMA, whoever is most knowledgeable about the system's day-to-day operations should be present for the survey.

Item 2	Were water system records available for your review?
Guidance	To prepare for this question, review the information in Section 3.1.1. We expect purveyors to make information that supports the goals of the sanitary survey available to you.
How to mark the checklist	Mark "No" if the purveyor didn't provide any records for review necessary to achieve the objectives of the survey. Mark "partial" if the water system provided some records for your review.
Classification	Observation if marked "No" or "Partial."
WAC reference	WAC 246-290-416
Publications	*Sanitary Surveys of Public Water Systems* 331-197 (PDF) *Records Retention Reminder* 331-431 (PDF)
Webpage(s)	Sanitary Surveys of Drinking Water Systems
Standard language	Water systems must provide information in support of a thorough sanitary survey (WAC 246-290-416). You didn't provide enough information to achieve the objectives of this sanitary survey. You must provide DOH with the information listed below. Based on the availability of this information to DOH and its content, there may be other sanitary survey follow-up tasks in addition to those already described in this letter. (then list the requested information)
Other notes for the sanitary surveyor	When scheduling the survey, it is important to make it clear that records must be available for review as part of the survey (see Section 3.1.1). Describe the records needed and confirm that the person you schedule the survey with is someone who can make water system records available during the survey If records are not available because the system does not have any, record this as an observation. All non-expanding small water systems must develop and implement a SWSMP. See Item 3.

Item 3 and 3a	**Has the water system developed and implemented either a Small Water System Management Program or a Water System Plan?** **If no, are the following planning documents complete and up to date:**
Guidance	Ask the water system staff to show you their current planning document. If the planning document appears complete or received DOH approval, check the completion date or approval date. If the completion or approval date is over six years past, or the system made significant changes since completing the planning document, some elements of the planning document may need updating. Inform the operator that the planning document is the repository of the most basic policies, procedures, data, drawings, and financial information needed to keep the system operating properly under various circumstances, such as loss of use of facilities, reasonable financial contingencies, or loss of institutional knowledge due to the loss of the operator or key governing board members. Because a water system operates in a dynamic and changing world, it must amend its planning document from time to time. For example, the emergency response plan or operations and maintenance program may need edits to contact numbers or for new equipment procedures.
How to mark the checklist	Mark **Item 3** "Yes" if we approved the water system's planning document. Mark **Item 3** "Yes" if the SWSMP contains complete and up to date elements of each subject area listed in **Item 3a**. Mark **Item 3** "No" for any other answer, including evidence that the purveyor made progress toward completing some or even many of the nine elements described in **Item 3a**. If you mark **Item 3** "no," then mark the status for each individual element under **Item 3a**. Look at the completed planning elements and check the appropriate box for each SWSMP element.
Classification	Observation if Item 3 is marked "No."
WAC reference	WAC 246-290-100 and -105
Publications	*Planning Requirements for Public Drinking Water Systems* 331-202 (PDF) *Small Water System Management Program Guide* 331-134 (PDF) *Noncommunity Small Water System Management Program Guide* 331-474 (PDF)
Webpage(s)	Water System Planning Requirements Noncommunity Small Water System Management Program Guide
Standard language	**If Item 3 is marked "No" and few, if any, planning elements are completed (Item 3a).** Every public water system must develop and implement a SWSMP if it isn't required to complete a Water System Plan (WAC 246-290-105). The SWSMP is a powerful tool for documenting operations and management procedures; it provides information the governing board and the operator need to remain in compliance and to protect public health when operations don't go as expected. You don't need to submit the SWSMP to us for review and approval at this time, but it should be available for review on request. You can find guidance on SWSMPs for community systems in *Small Water System Management Program Guide* 331-134 (PDF) and for noncommunity systems in *Noncommunity Small Water System Management Program Guide* 331-474 (PDF). We designed these do-it-yourself guidance documents to help you complete the right management program for your system. If you need help, call our regional office.

Item 3 and 3a	**Has the water system developed and implemented either a Small Water System Management Program or a Water System Plan?** **If no, are the following planning documents complete and up to date:**
Other notes for the sanitary surveyor	The purpose of the *Small Water System Management Program Guide* 331-134 (PDF) is to help owners and operators of small nonexpanding Group A water systems meet the requirements of state and federal laws, and ultimately to protect the health of their customers. Much of the guide will be useful on a day-to-day basis. System personnel can use the guide as a filing system. Water systems that already have a SWSMP tell us that it can serve many purposes, such as providing a: • Central location for numerous water system records and system policies. • Process to evaluate present and future system deficiencies and improvements necessary for continued water system operation. • List of operation and maintenance duties that existing and future water system personnel can review, use, and improve to effectively manage and operate the water system. For ease of use, the SWSMP should be in a three-ring binder with dividers for each element. In addition, by completing a SWSMP, the system will satisfy the Small Water System Management Program requirement in state rule (WAC 246-290-105) and the capacity requirement for water systems mandated in the federal Safe Drinking Water Act. If you or the purveyor aren't sure which type of planning document to complete, and what to include in it, please ask our regional planner for guidance. For most small water systems, the right planning document is a Small Water System Management Program (SWSMP), unless the system plans to construct new facilities or expand their service area to serve additional customers. If the system intends to expand, the right planning document is a Water System Plan (WSP). If this is the case, the water system should contact our regional office to schedule a WSP pre-plan conference.

Item 4	Does the water system plan to make capital improvements in the next 1-3 years?
Guidance	We would like to know if a water system is planning to make a significant investment into its water infrastructure. With this information, we can communicate with the system about funding options and their associated obligations.
How to mark the checklist	Mark "Yes" if the water system plans something big within the next three years, such as constructing a new or replacement pipeline, constructing a new well, rehabilitating an existing well, installing treatment, constructing a new storage tank, or rehabilitating an existing storage tank.
Classification	Informational.
WAC reference	WAC 246-290-100, -105, -110, and -120
Publications	*Asset Management for Small Water Systems* 331-445 (PDF) *How to Hire an Engineer* 331-044 (PDF)
Webpage(s)	Drinking Water State Revolving Fund (DWSRF)
Standard language	None.
Other notes for the sanitary surveyor	This information will be accessible to our State Revolving Loan Fund Program.

Item 5	Is there a backup operator available if the regular one is not available?
Guidance	Small water systems usually employ a single individual with primary operational responsibility. The daily involvement and after-hours availability of this operator (certified or not) is crucial to the safe and reliable delivery of drinking water. Absence due to illness, vacation, or other reason may expose the water system—and the public—to increased risk unless another qualified individual with a basic understanding of normal and emergency operational practices is available to fill in.
How to mark the checklist	Mark "No" if the system does not designate a qualified individual to fill the operator role when the certified operator (or regular operator if this is a TNC system) is sick or on vacation.
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-415 (6) WAC 246-290-420 (9) WAC 246-290-020 WAC 246-292
Publications	*Protecting Public Health: Requirements for Waterworks Operators* 331-466 (PDF) http://www.doh.wa.gov/portals/1/documents/pubs/331-466.pdf *Owning and Managing a Drinking Water System* 331-084 (PDF) http://www.doh.wa.gov/portals/1/Documents/pubs/331-084.pdf
Webpage(s)	Waterworks Operator Certification webpage Office of Drinking Water Rules webpage
Standard language	We recommend that you employ a Satellite Management Agency or a Contract Operator to fill a temporary absence of the operator. We can provide a list of qualified individuals.
Other notes for the sanitary surveyor	A "No" response to this question is aggravated by a "No" response on Item 3, failure to complete a small water system management program. No qualified back up operator, combined with no written operations and emergency response plan, increases system vulnerability.

Item 6	Did you review the water system's water quality monitoring requirements with the purveyor?
Guidance	We provide each Group A water system with the information needed to comply with its system-specific sampling requirements. We want to be sure the operator is aware of this information, understands it, and is committed to meeting all the sampling requirements
How to mark the checklist	Mark "Yes" if you reviewed past water quality results (from pre-survey data packet) and future water quality monitoring requirements (from WQMS (Section 3.3.3.5)).
Classification	Informational
WAC reference	None
Publications	*General Sampling Procedure* 331-219 (PDF) *Volatile Organic Chemical (VOC) Sampling Procedure* 331-220 (PDF) *Inorganic Chemical (IOC) Sampling Procedure* 331-221 (PDF) *Nitrate Sampling Procedure* 331-222 (PDF) *Haloacetic Acid (HAA5) Sampling Procedure* 331-223 (PDF) *Synthetic Organic Chemical (SOC) Sampling Procedure* 331-224 (PDF) *Coliform Distribution System Sampling Procedure* 331-225 (PDF) *Total Trihalomethane (TTHM) Sampling Procedure* 331-226 (PDF) *Lead and Copper Sampling Procedure* 331-227 (PDF)
Webpage(s)	Drinking Water Contaminants webpage
Standard language	None
Other notes for the sanitary surveyor	Call our regional office. The regional source monitoring program manager can answer questions about source monitoring.

Item 7	Did you review water quality sample results and trends with the purveyor?
Guidance	See section 3.3.2 when preparing for this discussion. Note any explanation the operator offered for water quality trends in Part C. Refer to the pre-survey data packet for water quality results. Verify sample site locations: confirm source samples taken after treatment and before the distribution system, and coliform samples collected from representative locations in the distribution (not the well house!). Review the system's coliform monitoring plan against the coliform sampling locations described to you.
How to mark the checklist	Mark "Yes" if you reviewed recent water quality results and identified trends (if any).
Classification	Informational.
WAC reference	None.
Publications	
Webpage(s)	
Standard language	None.
Other notes for the sanitary surveyor	Contact your regional office if you discover gross compliance sampling errors (see Item 104) or you suspect fraud (see "additional surveyor comments about the certified operator" after Item 104). Look for seasonality of nitrate and coliform results. Identify "outliers" that are grossly inconsistent with all other results. Document any suspected correlation between unusual results and treatment status, climactic event, or exceptionally heavy water demand. Discuss sources of contamination in the sanitary control area (SCA) that could contribute to unsatisfactory coliform or increasing nitrate results. Identify a trend of increasing nitrate levels. If the trend approaches the 5 mg/l nitrate trigger level, explain possible consequences, including quarterly monitoring. Identify TC+ routine samples from a system with disinfection and discuss possible causes, sampling sites, treatment reliability, sample collection training, and so on. Note sources with elevated iron and manganese and discuss effects on water quality. Discuss distribution system main flushing, customer complaints, possible treatment options. If coliform sampling results reflect poor or unacceptable selection of routine coliform sampling locations, Mark "No" for Item 104 in Section L.

Item 8	Does the system have emergency power?
Guidance	Portable or fixed-in-place generators or mechanical drive engines directly powering pumps can provide useful, and at times, critically important redundancy to an otherwise unreliable utility power supply.
How to mark the checklist	Mark "Yes" if the water system has a portable or fixed-in-place generator or a mechanical drive engine directly powering one or more of the pumps necessary to deliver water into the distribution system. Mark "No" if the system has no emergency power source or uses a generator or mechanical drive as the primary source of energy to power pumps and other water infrastructure. Document this fact in the comments section of Part C.
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-420
Publications	*Preparing Water Shortage Response Plans* 331-301 (PDF) *For community systems: Small Water System Management Program Guide* 331-134 (PDF) See Section 1.6. *Non-Community Small Water System Management Program Guide* 331-474 (PDF) *Emergency Response Planning Guide for Public Drinking Water Systems* 331-211 (PDF) *Truck Transportation: Emergency Water Supply for Public Use* 331-063 (PDF)
Webpage(s)	Emergency Publications for Water Systems webpage
Standard language	We recommend that every water utility plan for the loss of power supply. Even during a power outage, a utility should be capable of maintaining a minimum level of service to its customers.
Other notes for the sanitary surveyor	Surveyors can ask systems with frequent power outages whether they have considered emergency power. You could recommend that they investigate back-up power for improved reliability. Systems can install the electrical connection necessary for using a portable generator without installing the complete system with automatic switchover capability. You can recommend that the operator develop an Emergency Response Plan that includes planning for a power outage while protecting public health.

Item 9	Does the system experience frequent power outages (>2 per year)?
Guidance	Unless the water system has gravity storage, a gravity source, or an emergency intertie with another water utility, a power outage will result in loss of pressure in the distribution system. Discuss whether the system staff notifies DOH about a loss-of-pressure event (they should), and how they respond to the pressure loss (health advisory, flushing, disinfection, sampling?).
How to mark the checklist	Mark "Yes" if the system suffered two or more power outages in either of the previous two years. Note in the comments section whether the system lost pressure during any of these power outages. A power outage is any event that denies the power a critical pump needs to perform adequately (such as a utility power outage, failure of the system's power service due to a lightning strike, power overload, control system component failure, and so on).
Classification	Informational.
WAC reference	WAC 246-290-420
Publications	*Preparing Water Shortage Response Plans* 331-301 (PDF) *Responding to a Pressure Loss Event* 331-338 (PDF) *Responding to a Backflow Event* 331-494 (PDF) *For community Systems: Small Water System Management Program Guide* 331-134 (PDF) See Section 1.6 *Non-Community Small Water System Management Program Guide* 331-474 (PDF) *Emergency Response Planning Guide for Public Drinking Water Systems* 331-211 (PDF) *Truck Transportation: Emergency Water Supply for Public Use* 331-063 (PDF)
Webpage(s)	Emergency Publications for Water Systems
Standard language	None.
Other notes for the sanitary surveyor	

Item 10	Does the system experience frequent water outages (>2 per year)?
Guidance	Any water outage creates an opportunity for contaminants to backflow or back-siphon into the distribution system. If the water system doesn't take proper measures, this contamination will reach consumers after the water system restores water service.
How to mark the checklist	Mark "Yes" if the water system suffered two or more water outages in either of the previous two years. A water outage is a loss of pressure in the distribution system, caused by power outage, line break, depleted source or storage, control system failure, or other reasons.
Classification	Informational.
WAC reference	WAC 246-290-420 WAC 246-290-451 (1)
Publications	*Responding to a Pressure Loss Event* 331-338 (PDF) *Responding to a Backflow Event* 331-494 (PDF) *Guidance Document: Preparing Water Shortage Response Plans* 331-301 (PDF) *Guidance Document: Water Shortage Response Plan for Small Public Drinking Water Systems* 331-316 (PDF) Special Report: Water Shortage June 2010 Water Tap 331-463 (PDF)v *Department of Health's Role During a Drought Emergency* 331-297 (PDF) *Emergency Drinking Water Sources* 331-317 (PDF) *Emergency Loan and Funding Guidelines* 331-545 (PDF)
Webpage(s)	Emergency Publications for Water Systems Water Shortage Response Plans for Small Public Drinking Water Systems
Standard language	None.
Other notes for the sanitary surveyor	

Item 11	Does there appear to be adequate reliability for this system?
Guidance	Repeated power or water outages for the same or similar reasons are a sign of negligent or ineffective management and planning.
How to mark the checklist	Mark "No" if the system has received complaints of frequent water outages, experienced a large number of line breaks, or lost service for any reason that you believe is the result of poor management and planning.
Classification	Observation if marked "No."
WAC reference	WAC 246-290-415 (2) WAC 246-290-415 (6) WAC 246-290-420
Publications	*Responding to a Pressure Loss Event* 331-338 (PDF) *Responding to a Backflow Event* 331-494 (PDF) *Water System Design Manual* 331-123 (PDF) Sections 3.10, 4.4.2, 5.11.1, 5.11.2, and 7.1.1.3
Webpage(s)	
Standard language	All public water systems must provide reliable water service (WAC 246-290-420). This water system suffers from repeated water outages because of _____. Submit your plan to address the poor reliability of operations to us. Any water outage creates an opportunity for contaminants to enter into the distribution system. Your plan should include procedures to prevent and respond to water outages. These procedures should be in your operation and maintenance and emergency response plans. Until you have this problem solved, follow the guidance in *Responding to Pressure Loss* 331-338 (PDF) anytime an event results or is expected to result in pressure loss in the distribution system. If pressure loss occurs, contact the DOH regional office as soon as possible after taking measures to protect the health of your customers and prevent damage to your water infrastructure.
Other notes for the sanitary surveyor	"All public water systems shall provide an adequate quantity and quality of water in a reliable manner at all times consistent with the requirements of this chapter," (WAC 246-290-420).

Checklist Part D: Sources

Sources constitute the largest part of the checklist and include the largest number of potential significant deficiencies and significant findings. A WFI collects more data about the source of supply than about any other part of a water system. A significant portion of federal and state rules focus on establishing the criteria for collecting samples from a particular source to demonstrate that it is safe to use as a public drinking water supply. All this attention reflects the obvious importance sources have to the water system's capacity to maintain a safe and reliable drinking water supply to all of its customers.

Unless the source is a spring on a hillside or a powerful artesian well, each source of supply comes with a pump. Many sources of supply also come with some form of treatment, such as adding chlorine (for disinfection). *Pumps* and *Treatment* have their own part of the checklist.

We can learn a lot about the relative safety and reliability of the whole drinking water system by understanding how a source was constructed, its setting among potential sources of contamination, how it responds to various climactic conditions (floods, drought), and threats to operations (power, pump, and structural failure).

It is not acceptable for water systems to run out of water. The main job of a water system's sources is to provide a continuous supply of water capable of meeting the maximum daily demand of the water system, even if that level of demand occurs only a few times each year.

Most sources also pressurize the distribution system. The level of pressure added to the source water is a function of the difference in elevation between the pumping level of the source water and the ground surface at the source, the rate of flow, the elevation of customers above the source, and the "residual" pressure necessary to meet customers' expectations when they turn on their faucets. State standards require that the "residual" pressure be at least 30 psi, except under fire flow conditions.

Topics to Describe in the Comments Section of Part D

- The sources and how they function (well pump condition and controls).
  - Include emergency sources.
  - Include interties and intertie agreements.
- Any major changes to the source since the last survey, such as pump replacement, deepening, or reconstruction.
- Security concerns.
- Source approval status.
- Concerns about the well house structure.
- Any concerns about the SCA for a source and the source susceptibility. Also, pay attention to the generator fuel source. Is containment adequate?
- If the system does not have a well log, what information is known about the source?
- Explain how often the system measures the water level.

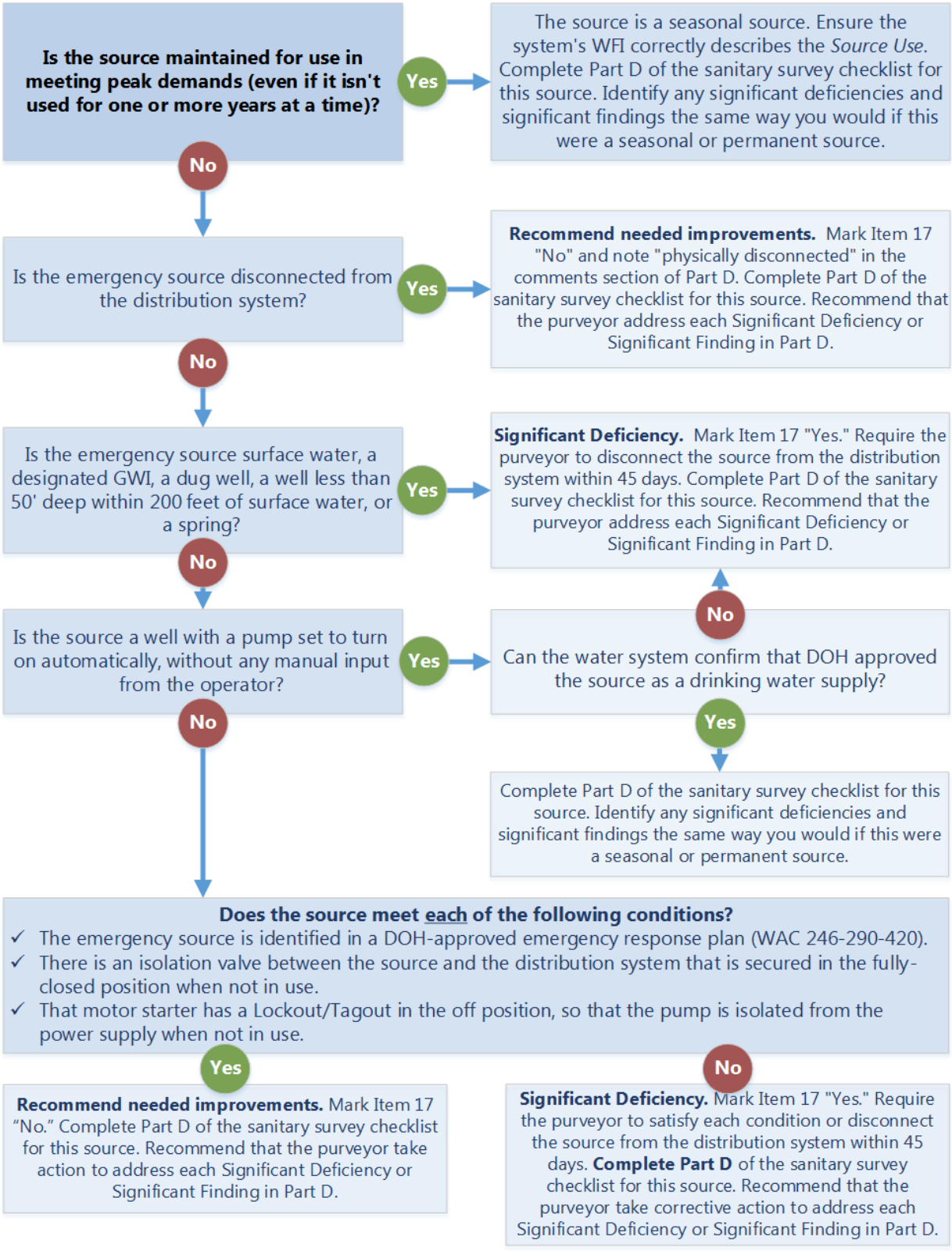
Item 12 and 12a	Did you observe a source connected to the water system that is NOT listed on the WFI and in active status? If yes, has the source received written DOH approval?
Guidance	This two-part question seeks to identify a source used as a seasonal or permanent source that doesn't appear on the WFI. The second part of this question reflects the possibility that a permanent or seasonal source exists, is in active status, and has our approval but wasn't added to the WFI.
How to mark the checklist	Mark **Item 12** "Yes" if you observe a source connected to the water system that isn't listed on the WFI and is in active status. Active status means a source is operating or meant to operate under a programmed set of conditions (low pressure, low reservoir level, or to meet peak demands). Mark **Item 12a** "No" if we inform you that the source hasn't received our **written** approval. **Surveyors should check with us on source approval status before completing the sanitary survey cover letter and checklist.**
Classification	**Item 12a** is a Significant Deficiency if marked "No."
WAC reference	WAC 246-290-110, 120, 130(1) WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Immediately stop using the unidentified source. Disconnect the source from the distribution system and contact the regional engineer for further information on obtaining source approval.
Other notes for the sanitary surveyor	WAC 246-290-130(1) states: "No new source, previously unapproved source, or modification of an existing source shall be used as a public water supply without DOH approval. No intake or other connection shall be maintained between a public water supply and a source of water not approved by the department."

Item 13 14, 15, 16	DOH source number and source use
Guidance	The checklist requires the surveyor to identify the well by source number (SO#). Refer to the WFI for source number. The source number is not necessarily the well number the water system assigned (Well 2 could be designated as S03).
How to mark the checklist	Not applicable.
Classification	Informational.
WAC reference	246-290-480(a)(i)
Publications	The criteria for designating a well field are in Appendix B of the *Water System Design Manual* 331-123 (PDF)
Webpage(s)	
Standard language	None.
Other notes for the sanitary surveyor	If the source is a well field with two or more wells, do not use the source number for the well field in Item 13. The WFI should assign a separate source number for each well in the well field. Use the individual well source numbers on the checklist. You should confirm that the minimum criteria for designating a well field are met. To consider different wells as a well field, they must draw water from the same aquifer, have very similar water quality, and have a common sampling point prior to entry to the distribution system. If the wells don't meet all the criteria, note your findings under comments in Part D. Three designations are used to identify the sources: • Source number (such as S02). • Source name the water system assigned to the source (such as Well 2). • Well tag the Department of Ecology assigned. If you think a source was misidentified, take photos of the well tag and well location, note your concern on the WFI, and contact the source monitoring program manager at our regional office. **Status** is another way to classify a drinking water source. You may encounter three types of source status. 1. **Pre-Active:** DOH approved the source, but the system hasn't put it into service yet. 2. **Active:** The source is in active service. Active status can apply to any type of source use (permanent, seasonal, or even emergency use). 3. **Inactive:** The system took the source out of service. When a system takes an active source out of service, the source use remains the same (for example, permanent) while the source status changes from "active" to "inactive." If a source status is pre-active or inactive, it will show up after the source name in column 16 on the WFI. For example, "Beech Street Well (inactive)." We will not enforce a directive to decommission a well unless the inactive well is a contaminant threat to an active permanent or seasonal drinking water source. You may direct the water system to decommission an inactive well if your local ordinance gives you that authority.

Item 17	If this is an emergency source, should it be disconnected?
Guidance	During a sanitary survey, you should inspect all emergency sources except for an emergency intertie with another public water system. We want to know whether any stand-alone emergency source is "physically connected" to the system. If so, use the criteria in *Standard Language* below to determine whether the system needs to disconnect it.
How to mark the checklist	If the source is **not an emergency source**, mark "NA." If the emergency **source is disconnected**, mark "No." Note "physically disconnected" in the comments section of Part D. If the **source is connected**, review the Emergency Source Significant Deficiency Decision Path to determine whether the physical connection is a significant deficiency. If so, mark "Yes" and explain why the system must disconnect the source (see Standard Language).
Classification	Significant deficiency if marked "Yes." See the *Emergency Source Significant Deficiency Decision Path*—see below.
WAC reference	WAC 246-290-001 (2) WAC 246-290-130 WAC 246-290-131 WAC 246-290-132 WAC 246-290-415 (6)
Publications	*Emergency Drinking Water Sources* 331-317 (PDF)
Webpage(s)	Emergency Publications for Water Systems
Standard language	**If the emergency source is surface water, a designated GWI, a dug well, a well less than 50 feet to the first open interval located within 200 feet of surface water, or a spring.** Physically disconnect the emergency source from the distribution system and provide us with electronic photographs confirming the disconnection. Contact us for requirements you must meet to reconnect the source. **If the emergency source is a well that doesn't meet the conditions for remaining physically connected** (see Emergency Source Significant Deficiency Decision Path—see below). **Do one of the following.** 1. Submit proof that the emergency source meets **all three** of these conditions, per WAC 246-290-131: • The emergency source is in a ODW-approved emergency response plan. • There is an isolation valve between the source and the distribution system secured in the fully closed position when not in use. • The motor starter has a Lockout/Tagout in the "off" position, so that the pump is isolated from the power supply when not in use. 2. Physically disconnect the emergency source from the distribution system by removing a pipe segment or using another ODW-approved technique (WAC 246-290-131). Send us electronic photographs confirming the disconnection. Contact us for requirements you must meet to reconnect the source.

Other notes for the sanitary surveyor	A purveyor must receive permission from a local or state health official before physically reconnecting and activating a source to supply the distribution system. A designated emergency source benefits a water system by providing ready stand-by capacity to meet unanticipated water supply needs, and addresses the following off-normal events. 1. Temporary failure of one or more nonemergency source when the remaining supply sources cannot maintain 20 pounds per square inch during PHD throughout the water distribution system. 2. The water system cannot meet the fire suppression requirement (flow rate and duration) combined with MDD while maintaining positive pressure throughout the distribution system. Elements of the water system's emergency response plan that touch on emergency sources should: • Include source name, ODW source number, capacity, and location. • Identify the engineering design approval status. • Identify who in authority will decide to start the source. • Describe the conditions that would prompt the system to start the source. • Describe the operational steps the system will take to start the source, such as checking water level, flushing, disinfection, changing valve position, and so forth. • Describe the minimum water quality sampling the system will do before starting the source. • List the public notification steps the system will take, and the need to notify us that the emergency source is in operation. • Define the on-going care and maintenance needed to keep the emergency source functional and available when needed (flushing, sampling, lubrication, and so on).

Emergency Source Significant Deficiency Decision Path



Item 18	Is the source a potential GWI source?
Guidance	A well is "potential groundwater under the direct influence of surface water" (GWI) if it is located within 200 feet of surface water and the depth to the first opportunity for water to enter the well casing (top of casing perforations or top of well screen) is 50 feet below ground surface or less. Every spring is a potential GWI.
How to mark the checklist	Mark "Yes" if the source is a spring **or** the source is a well within 200 feet of surface water and you know the depth to the first open interval is less than 50 feet below ground surface. The regional office will refer all checklists marked "Yes" to the regional GWI program lead to ensure that the source had the appropriate GWI evaluation.
Classification	Referral. If marked "Yes," refer this to the GWI program lead at the DOH regional office.
WAC reference	WAC 246-290-010 WAC 246-290-640
Publications	*Groundwater Sources Under the Direct Influence of Surface Water (GWI)* 331-216 (PDF) http://www.doh.wa.gov/portals/1/Documents/pubs/331-216.pdf *Potential GWI Sources-Determining Hydraulic Connection Through Water Quality Monitoring* 331-230 (PDF) *Potential GWI Sources—Microscopic Particulate Analysis* 331-231 (PDF)
Webpage(s)	Groundwater Sources Under the Direct Influence of Surface Water (GWI) Program
Standard language	Well # (S0#) appears to meet the definition of potential groundwater under the influence of surface water (GWI). You will need to take S0# through DOH's GWI evaluation program if you haven't already done so. If necessary, DOH will contact you with further information on the GWI evaluation process.
Other notes for the sanitary surveyor	If you observe a well to be less than 200 feet from surface water, find out whether the depth to the first open interval is less than 50 feet below ground. If a well log is unavailable, note the need for us to follow-up with the water system to determine the depth to the first open interval. If the source appears to be potential GWI, and you're certain that the source hasn't gone through the GWI evaluation process, tell the operator that you must refer this to DOH for further follow-up.

Item 19	**Is the sanitary control area free of unmitigated potential sources of contamination?**
Guidance	If you observe a potential contaminant threat within the Sanitary Control Area (SCA), find out whether we already evaluated the threat. Before the survey, review the last sanitary survey letter and checklist to determine whether the last surveyor identified any potential source of contamination in the SCA. If so, find out whether the purveyor removed the contamination source, developed an ODW-approved mitigation plan, or got our approval to reduce the SCA (WAC 246-290-135). Potential threats include a sanitary sewer, septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, storm water treatment swale, nearby surface water, fuel or chemical storage, or fuel pipelines. If you discover that the system failed to take the steps required in the last survey or currently fails to maintain mitigation, the failure is a Significant Deficiency. In addition, any new (previously unrecorded) potential contaminant threat you find is a Significant Deficiency.
How to mark the checklist	Mark "Yes" if there are no potential sources of contamination within 100 feet of the well. Mark "Yes" if there are potential sources of contamination, but you are certain the purveyor appropriately mitigated the threat or DOH approved a reduction in the SCA and the threat is not within the reduced SCA. Mark "Unk" if you believe there are subsurface threats within the SCA but you don't know where they are. In the comments section of Part D, describe your reason for requiring the system to submit documentation to us. If you don't provide sufficient reason, we will not consider "Unk" to be a Significant Finding (see below) Mark "No" for all other circumstances. All "No" answers will trigger an ODW file review before completing the cover letter. The review will determine whether there is a past mitigation plan approval (including the need for treatment) or approval for a reduced SCA.
Classification	Potential Significant Deficiency if marked "No," subject to file research and our confirmation before completing the cover letter. Significant Finding if marked "Unk."
WAC reference	WAC 246-290-135 WAC 246-290-415 (6)
Publications	*Source Water Protection Requirements* 331-106 (PDF) *Wellhead Protection Program Guidance Document* 331-018 (PDF) *Sanitary Control Area Protection* 331-453 (PDF) Surface Seals—Problems and Solutions (96-br-099) Ecology
Webpage(s)	Source Water Protection Program Well Report Search Options (Ecology)
Standard language	**For a biological contaminant hazard that cannot be removed easily (sewer line, septic tank, drain field, irrigation canal or other surface water, waste lagoon, manure pile).** [Name the biological hazard(s)] is/are in the sanitary control area of Well X (S0X). Submit a scaled map showing all buildings and potential sources of contamination located within 100 feet of the well. Include all known information about the type, size, depth, and other construction details of the potential contaminant source. Also, include a copy of the well log showing construction details. Based on the information submitted, we will contact you about any required follow-up actions. **For a biological contaminant hazard that can be moved or removed (portable toilet, manure pile).** Remove the [name the item] to a distance greater than 100 feet from Well X.

Item 19	Is the sanitary control area free of unmitigated potential sources of contamination?
	For a chemical contaminant hazard that cannot be removed easily (such as buried fuel tank or fuel lines, above ground bulk fuel or chemical storage). Submit a scaled map showing all buildings and potential contamination sources located within 100 feet of the well. Include all known information about the type, size, depth and other construction details of the potential contaminant source, including any mitigating design features such as existing spill containment, double-wall construction and so on. Also, include a copy of the well log showing the construction details for the well. Based on the information submitted, we will contact you about any required follow-up actions. **For a chemical contaminant hazard that can be moved or removed (household chemicals, fuel cans, pesticides).** Remove the [name the chemical hazard(s)] to a distance greater than 100 feet from Well X. **If the source is within a developed area and you easily recognize evidence of underground constructed facilities but aren't sure about the location and type of subsurface threats within the SCA (for "Unk").** Send us a scaled map indicating the location of all subsurface facilities within the sanitary control area, including sewer lines, storm drains, and any other liquid or gas pipelines; septic tanks and drain fields; buried waste; and abandoned wells. The map should indicate the distance (in feet) from the drinking water supply to the subsurface facility.
Other notes for the sanitary surveyor	Mitigation means one or more provision is in place to decrease the risk of contamination. Acceptable mitigation measures include: Concrete floor (no floor drain) and constructed secondary spill containment for generator fuel stored within the SCA. Grouted, sealed pressure-rated piping sleeve installed around a sanitary sewer line within the SCA. Pressure-rated water main pipe and joints used to convey storm drainage through an SCA. Not all potential contamination sources have the same priority, and many potential contaminant threats are not significant deficiencies. At one end of the spectrum is a sanitary sewer (especially old clay or concrete), septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, roadway storm-water treatment swale, or surface water within the SCA. These microbial hazards pose an immediate and acute health risk. Reduce acute contaminant threats in the SCA. If not, we will require the purveyor to eliminate these contaminant sources from the SCA or demonstrate that it mitigated the threat appropriately. Treatment to CT6/4-log virus inactivation of the source is also an option for addressing SCA violations. At the other end of the spectrum is a light application of herbicide or a parked car that might leak motor oil or other fluids. These chronic contaminants aren't an immediate health risk. The scale of the potential chronic threat is important. Is it one car or fifty junk cars near the well? Is the area treated and amount of weed killer used small or is it applied on an industrial scale? If you think the chronic contaminant threat is small, mark Item 19 "Yes," but note what you saw and why you believe the risk to the water supply is minor.

Item 20	Is the wellhead located in a pit or vault?
Guidance	Wells should be built so that the top of the casing is at least six inches above the floor or finished ground surface. Grading should direct water *away* from the wellhead.
How to mark the checklist	Mark "Yes" if the well is in a below-grade vault or pit.
Classification	Recommendation if marked "Yes."
WAC reference	WAC 173-160 (state well construction standards) WAC 246-290-130
Publications	Ecology's Surface Seals—Problems and Solutions (96-br-099)
Webpage(s)	Source Water Protection
Standard language	We recommend that the next time you pull the well pump for maintenance or replacement, you extend the well casing to at least 12 inches above the pump house floor or finished grade.
Other notes for the sanitary surveyor	Item 21 will supersede this item if the vault is subject to flooding. If you mark Item 21 "Yes," do not include the recommendation for Item 20 in the survey report even if the well is in a pit or vault. If you mark Item 21 "No," and the vault or pit has other protection against flooding, include the recommendation for Item 20 in the survey report if the well is in a pit or vault.

Item 21	Is the wellhead at risk of submergence?
Guidance	A well is at risk of submergence if it is in a flood plain, in a below-grade vault or pit without a drain or sump pump adequate to discharge leakage, in the direct path of surface water run-off, or any other circumstance where the top of the well casing is at risk of being submerged.
How to mark the checklist	Mark "Yes" if any of the conditions described in the "standard language" section exist.
Classification	Significant deficiency if marked "Yes."
WAC reference	WAC 246-290-135 WAC 246-290-415 (6) WAC 173-160-291 (Standards for water well construction)
Publications	Ecology's Surface Seals—Problems and Solutions (96-br-099)
Webpage(s)	Source Water Protection
Standard language	**If the wellhead is in a pit, there is no drain to daylight, and no sump pump with the capacity needed to keep the wellhead from becoming submerged if a pipe leaks.** Submit a corrective action plan to ensure the wellhead is not at risk of submergence due to high groundwater, run-off into the pit, or pipe leakage. Examples of acceptable corrective actions include: 1) Extend the well casing to at least 6 inches above the surrounding grade; 2) Install a drain to daylight capable of discharging by gravity the full flow of the well pump before water rises above the well casing; or 3) Install a sump pump capable of discharging the full flow of the well pump before water rises above the well casing. **If the well is in the path of surface run-off that could submerge the top of the well casing.** Submit a corrective action plan to ensure that water does not pond at the wellhead. **If the well is located in the flood plain.** Submit a corrective action plan to ensure the wellhead is not at risk of submergence due to flooding. Examples of acceptable corrective actions include: 1) Extend the well casing to at least 24 inches above the 100-year flood elevation and 6 inches above grade; or 2) relocate the well.
Other notes for the sanitary surveyor	If the wellhead is in a vault or pit, it must drain to daylight or have an appropriately sized sump pump. The risk of submergence may be a leak in the well-pump discharge piping, high groundwater conditions, or surface water flow into the below-grade structure. The daylight drain and pump must be able to discharge enough flow to ensure the wellhead is not submerged. To prevent the water level in the pit or vault from rising above the top of the well casing and threatening the water quality in the well, the drain must be big enough, and installed with enough slope, to discharge a significant portion of the well capacity. The drain outfall must provide unrestricted discharge. We recommend putting a screen on the pit or vault drain. Look for telltale signs of past flooding or evidence of surface water run-off that may submerge the top of the well casing. If the well casing extends above the ground or finished floor by only a few inches, look for conditions that could submerge the top of the well casing. If surface run-off could submerge the top of the well casing, acceptable corrective actions include regrading or extending the well casing to at least 6 inches above the finished grade without damaging the surface seal. If surface seal damage does *cause* a depression that puts the wellhead at risk of submersion, the operator should repair the surface seal damage.

Item 22	Is the well cap sealed, watertight, and free of unprotected openings?
Guidance	Look for missing bolts or a loose-fitting well cap, a missing plug in the well cap, or a crack in the well cap.
How to mark the checklist	Mark "Yes" if the well cap is water tight, undamaged, properly fitted, and correctly installed.
Classification	Significant deficiency if marked "No."
WAC reference	WAC 246-290-130 WAC 246-290-415 (6)
Publications	*Simple Fixes for Wellhead Openings* 331-232 (PDF) Ecology's Well Caps: Problems and Solutions (96-br-098)
Webpage(s)	
Standard language	If the well cap is damaged or ill-fitting: Replace the well cap with one that meets the Water Systems Council (WSC) standard for PAS-97(2012). If the well cap can be repaired or sealed: Seal any openings in the wellhead with silicone or caulk to keep dust, insects, or other contaminants out.
Other notes for the sanitary surveyor	The well cap should come from a listed manufacturer of approved well caps. See our Pitless Adapters, Pitless Units, and Well Caps Policy M.01. If the well cap has been tampered with, see Item 31.  

Item 23	Is the well casing free of any unprotected openings?
Guidance	Inspect the well casing for holes and cracks of any size.
How to mark the checklist	Mark "Yes" if there are no cracks or other openings that allow contaminants to enter through the well casing.
Classification	Significant deficiency if marked "No."
WAC reference	WAC 246-290-130 WAC 246-290-415 (6)
Publications	*Simple Fixes for Wellhead Openings 331-232* (PDF)
Webpage(s)	
Standard language	Seal any openings in the wellhead with silicone or caulk to keep dust, insects, and other contaminants out.
Other notes for the sanitary surveyor	If it looks like a vehicle could hit the well, you should tell the operator to check for underground damage to the casing. Wells developed as pit-less units may have a dislodged discharge pipe or a corroded connection creating an opening in the casing. A well professional should exam pit-less unit wells with wet areas or significant sunken ground around the casing. Dug wells do not have "casings" like drilled wells, but the sanitary risk is the same. There may be inspection ports you can use to see the interior walls of the well. Improperly sealed concrete rings may allow water above the aquifer to infiltrate. This is not an acceptable design.

Item 24 and 24a	Is there a vent on the well? If yes, is the vent protected? (24-mesh screen or slots)
Guidance	Every well casing should have a vent to maintain atmospheric pressure inside the well casing during pump operation and shutdown. To keep contaminants out of the public drinking water supply, the casing vent must be constructed and screened to keep contaminants out. Every vent must have noncorrodible 24-mesh (insect) screen securely placed over the end of the vent.
How to mark the checklist	Mark **Item 24a** "Yes" if the well casing vent is built and screened to keep contaminants out of the drinking water supply.
Classification	If the answer to **Item 24** is "No," skip **Item 24a**. Observation if **Item 24** marked "No." Significant Deficiency if **Item 24a** marked "No."
WAC reference	WAC 246-290-130 WAC 246-290-135 WAC 246-290-415 (6)
Publications	*Simple Fixes for Wellhead Openings* 331-232 (PDF) http://www.doh.wa.gov/portals/1/Documents/pubs/331-232.pdf
Webpage(s)	
Standard language	**Item 24 marked "No" is an observation:** A well must have a casing vent constructed to maintain atmospheric pressure inside the well by allowing air to enter and exit as the water level in the well changes (WAC 246-290-200 and -415). Install a casing vent with a screened, downward facing opening. The screen must be noncorrodible 24-mesh and the down-turned opening should be at least 18 inches above the floor. Please see *Simple Fixes for Wellhead Openings* 331-232 (PDF). **Item 24a marked "No" is a Significant Deficiency:** Install a casing vent with a screened, downward facing opening. The screen must be noncorrodible 24-mesh and the down-turned opening should be at least 18 inches above the floor. Please see *Simple Fixes for Wellhead Openings* 331-232 (PDF).
Other notes for the sanitary surveyor	Some wells use a pit-less adapter to discharge water underground from the pump to the distribution system. Vents may be on the underside or top of watertight pit-less unit well caps. Be sure to inspect the underside of the cap for the vent screen. This screen is often damaged or missing. You should have a mirror with you to examine the underside of pit-less unit well caps. If there is no vent, the well will draw air in through any available opening, seam, electrical conduit or other hole. These improperly protected openings are not acceptable. Some wells discharge through the top of the well. Those wells use a split well casing seal, which has a rubber seal around the inside of the casing. When the bolts that secure the two cast iron halves are tightened together, the rubber seal expands out against the casing and around the outside of the pump discharge pipe. The well seal has a threaded plug that allows installation of a gooseneck (downward-facing) vent.

Item 25	Are conduits and junction boxes sealed to keep contaminants out?
Guidance	On outdoor wells, you may observe broken conduits where the electrical power supply rises from below grade and enters the underside of the well cap. The breaks usually result from ground settlement. The broken conduit is an access point for contaminants to enter the well. Indoor wells have electrical conduits and junction boxes to supply the well pump with power. Openings in a junction box or conduit provide access for contaminants to enter the well.
How to mark the checklist	Mark "Yes" if the electrical conduits and associated junction boxes connected to the well are constructed and maintained to prevent contaminants from entering the drinking water supply.
Classification	Significant deficiency if marked "No."
WAC reference	WAC 246-290-130 WAC 246-290-135 WAC 246-290-415 (6)
Publications	*Simple Fixes for Wellhead Openings* 331-232 (PDF)
Webpage(s)	
Standard language	Repair and seal any openings in electrical conduits and junction boxes connected to the well casing to keep insects, rodents, or other contaminants out of the public drinking water supply.
Other notes for the sanitary surveyor	Mice can move easily inside the electrical conduit. Indoors, purveyors sometimes don't properly seal openings when installing or maintaining electrical junction boxes. An opening in the junction box leading from the motor starter to the top of the well may allow rodents to enter and nest, sometimes right over the well casing (the location of the last junction box before power enters the well casing). You should inspect every junction box all the way back to the electric service panel.

Item 26	Is the well unreasonably at risk to physical damage?
Guidance	Even the slightest bump from a heavy object (a vehicle) may cause a well casing to move out of alignment or crack. Such a bump also could cause the casing's annular seal to fail or the well discharge piping to leak. Evaluate the relative risk that a vehicle, machinery, or natural event (rockslide, mudslide, or avalanche) could damage the wellhead.
How to mark the checklist	Mark "No" if you believe the well location is safe from vehicles, machinery or other damage.
Classification	Significant Finding if marked "Yes."
WAC reference	WAC 246-290-135 WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Install posts, bollards or other protective structure around the well to prevent damage from vehicles, equipment, or machinery.
Other notes for the sanitary surveyor	Examples of unreasonable risk to damage include a well: • In or immediately next to a parking area. • Located where vehicles travel or machinery is used. • In a field where large farm equipment is used. • In a vault without a traffic-rated cover located in or immediately next to roadway. • At the base of an unstable slope. Will the well be visible after a snowstorm? Consider to what degree snow will obstruct the well and risk damage to the well structure.

Item 27	Is there a raw water source sample tap?
Guidance	Every well must have a sample tap before any form of treatment. The raw-water tap makes it possible for an operator to collect a "triggered" coliform sample from the source in response to an unsatisfactory routine coliform sample collected from the distribution system. Install the GWR sample tap as close to the source as possible and prior to all treatment facilities, pressure tanks, and storage tanks.
How to mark the checklist	Mark "Yes" if there is a raw water sample tap.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-320 WAC 246-290-415 (6)
Publications	*Groundwater Rule: Source Water Sample Taps* 331-436 (PDF)
Webpage(s)	
Standard language	Install a source sample tap as close to S0_ as possible and prior to all treatment facilities, pressure tanks, storage tanks, and prior to entry to the distribution system. The Groundwater Rule requires triggered source monitoring and assessment source monitoring or untreated source water.
Other notes for the sanitary surveyor	Systems that have sources without any treatment should use this same "raw water" sample tap to conduct all source chemical sampling (volatile organics, inorganics, etc.). The operator should only use a sample tap under the direct control of the water system as the raw water sample tap. A sample tap within 12 inches of the floor or ground is vulnerable to contamination. It is too close to contaminated surfaces; any water, cleaning products or other sprays directed at the surfaces may splash back to the tap. Raw water sample taps must be located before any treatment. To avoid increased risk of sample results that don't represent source water quality, they also should be located before other system components, such as pressure tanks. If the raw water sample tap is located after pressure tanks or other components, you can recommend that the purveyor move it. If the system has no raw water source tap, and the purveyor wants to address the Significant Finding by installing a yard hydrant, let them know that: • Although we would allow them to use a yard hydrant that conforms to Standard 1057 as a sampling tap, they should make every effort possible to install a sample tap directly off the well pump discharge pipe within a controlled environment (inside a secured well house). • They can't install a yard hydrant that drains the riser into the ground. The weep hole presents a contamination risk to the distribution system through a cross connection with contaminated groundwater. • The Uniform Plumbing Code requires using a yard hydrant that does not drain into the ground. Yard hydrants that conform to American Society of Sanitary Engineers Standard 1057 are acceptable because they do not drain into the ground. Instead, they drain into an enclosed chamber or tank located below the frost line. These are sometimes referred to as "sanitary" yard hydrants. You will know a sanitary yard hydrant by the atmospheric vent visible above ground near the base of the hydrant's riser pipe. • A sanitary yard hydrant works much the same way as a standard (unsanitary) weep-hole hydrant: when the hydrant is closed, the water in the riser drains down and out a hole located below the frost line to prevent freezing. However, instead of draining out a hole and into the soil, the sanitary hydrant drains into a sealed tank. When the hydrant opens, the water in the tank is expelled (by a vacuum-induced venturi effect) leaving the tank empty to

Item 27	Is there a raw water source sample tap?
	repeat the cycle when the hydrant is again shut off. Because the sanitary hydrant drains into a tank there is no cross contamination with the soil.  Well fields must have a source sample tap on the common discharge pipe, located prior to the entry to the distribution system.

Item 28, 28a, and 28b	**Is the source metered?** **If yes, is the source meter read at least monthly?** **If yes, does the purveyor maintain water production records?**
Guidance	Source meter installation and source meter reading became regulatory requirements in 2007. A reliable meter read on a regular basis will inform the operator and system owner about the water they supply to the distribution system. For example, unexplained changes in measured well output is a reason for investigation. A new leak or unauthorized use will show up as an unexplained increase in well production. Declining aquifer levels, well failure or pump problems will show up as an unexplained decrease in pumping flow rate. Operators need this information as soon as possible.
How to mark the checklist	Mark "Yes" if a source meter is installed and measuring total production from the source. Mark "Yes" if the operator reads the source meter at least once a month. Mark "Yes" if your record review confirms that the operator recorded monthly source meter readings at least once a month for the past 12 months.
Classification	Observation if any part of this question is marked "No."
WAC reference	WAC 246-290-105 WAC 246-290-130 WAC 246-290-496
Publications	*Preventive maintenance program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF) *Completing Your Annual WUE Report: Answers to Commonly Asked Questions* 331-459 (PDF)
Webpage(s)	Water Use Efficiency (WUE)
Standard language	**If no source meter:** A water system must install a meter on each source and record water production at least monthly (WAC 246-290-105 and -496). Currently, there is no source meter on Well X (S0X). Operating a public water supply without a source meter and the valuable information a meter provides, can be detrimental to system operation. After installing the source meter, we recommend that community water system purveyors record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns. **If source meter is not read monthly or is not recorded:** A water system must measure and record water production for each source at least monthly (WAC 246-290-105 and -496). We recommend that community water system purveyors record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.
Other notes for the sanitary surveyor	**For community systems:** A source meter, water consumption information (service meter readings), and estimates of authorized but unmetered uses, will allow the operator to calculate distribution system leakage as needed to comply with our water use efficiency rule. **For TNC and NTNC systems:** Routine source meter readings can help an operator identify leaks in a timely manner by providing a baseline for normal use. In addition, source meter data can help a system demonstrate compliance with its water right.

Item 29	Is the well house properly constructed and maintained?
Guidance	The well house should be: • Constructed of durable materials. • Weatherproof. • Heated (if in a freezing climate). • Free of obvious electrical or mechanical hazards. • Free of clutter and readily accessible. • Ventilated, clean and dry. It is safe to enter most well houses. However, if you consider a well house structure unstable or in such disrepair that entry is unsafe, DO NOT ENTER.
How to mark the checklist	Mark "Yes" if the well house meets all the standards listed above. Mark "No" if the well house doesn't meet all the standards listed above.
Classification	Recommendation if marked "No." Identify as a Significant Finding if the well house condition is so bad that it is unsafe to enter. Identify and describe the problems in the comments section of Part D. Photograph the condition of the structure but DO NOT ENTER it.
WAC reference	WAC 246-290-415(1) & (4) & (9) WAC 246-290-135(2)(a)
Publications	*Preventive Maintenance Program: Guide For Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	**Recommendation** We recommend that you make the following improvements to the well house: (List the specific improvements you believe the purveyor should make). **Significant Finding** The well house is unsafe to enter. Submit a plan to repair or replace the well house so that it is structurally sound, weatherproof, clean, dry, heated, and free of hazards.
Other notes for the sanitary surveyor	Record observations if there is a risk of freezing (no reliable heat source, insufficient insulation), leaking roof, leaking pipes, standing water, obvious physical or electrical hazards (confined space, unsafe wiring), or severe corrosion. If the well house condition compromises security and leaves the structure vulnerable to unauthorized entry, address this through Item 31. Inadequately protected well houses or enclosures may harbor animal or insect infestations. The SCA includes the immediate area around the well (see Item 19 and Item 30). Rodent, bat, bird, and insect nests in a well house are all potential sources of contamination. Poor ventilation, leaking roofs, or vapors from chlorine disinfection equipment may cause extreme corrosion of pipes, valves, pressure tanks, and controls. The purveyor should practice proper maintenance to protect the source facilities against corrosion.

Item 30	Is there any evidence of infestation by rodents or other pests?
Guidance	Avoid contact with rodent feces or urine. If the space appears badly infested, DO NOT ENTER. Otherwise, if you observe any rodent droppings, mark it on the checklist. Photograph the evidence of infestation and any obvious pathway for mice to enter the well house or well enclosure.
How to mark the checklist	Mark "No" if you do not observe any sign of mice or other rodent infestation.
Classification	Recommendation if marked "Yes." If the rodent contamination is so bad that it is unsafe to enter, DO NOT ENTER the structure. Identify and describe the problem in the comments section of Part D, noting the classification as a Significant Finding. Photograph the infestation inside the structure without entering it.
WAC reference	
Publications	*Pest Control* 331-363 (PDF)
Webpage(s)	
Standard language	**Recommendation** We recommend that you take the steps necessary to keep rodents out of your facilities. Rodents can carry disease and may create an unsafe working environment. Furthermore, if an opening into the well develops, rodents could contaminant the drinking water system. Your customers expect you to maintain their water system to the highest standards. **Significant Finding** The well house is unsafe to enter. Submit a plan to decontaminate the structure of rodent waste and to seal all pathways for rodents to enter the well house.
Other notes for the sanitary surveyor	This is your opportunity to educate the purveyor about the public health risks that rodents cause, including potential drinking water contamination and threats to the operator's health. A rodent-infested well house suggests poor routine maintenance and operation. Report the certified operator of a system with a Significant Finding under this item to our Operator Certification and Training Section.

Item 31	Is the well house and well protected from unauthorized access and tampering?
Guidance	The well house must be protected from unauthorized access. The well house should be constructed of rigid walls (tarps covering decayed or damaged walls are unacceptable). The water system should make sure the doors and windows remain locked or otherwise secured against unauthorized entry. There may be other acceptable ways to secure the well house. For example, a perimeter fence with a locking gate may replace the need to lock the well house. When the well is located outside the well house, the well cap and well casing should be: • Reasonably free from risk of physical damage (see Item 26). • Capped with a sanitary well cap securely bolted to the well casing. We consider such a well protected from tampering. See DOH Policy M.01 for a list of approved sanitary well caps used for wells with pit-less adapters.
How to mark the checklist	Mark "Yes" if you believe the well house and the well are adequately protected from unauthorized entry and tampering. Mark "No" if the well house is unprotected from unauthorized entry. Mark "No" if (1) the well is located outside the well house and isn't capped with a sanitary well cap; or (2) the well or well cap shows evidence of tampering or vandalism.
Classification	Significant Finding if marked "No."
WAC and Policy reference	WAC 246-290-415 (6) WAC 246-290-415 (9) DOH Policy M.01 (for a list of approved well caps)
Publications	*Responding to a threat against a water system* 331-183 (PDF) *Water System Security and Emergency Response Planning* 331-199 (PDF)
Webpage(s)	Emergency Response and Security
Standard language	**If the issue is simply ensuring entries to the well house are locked** Secure the well house against unauthorized entry. Install locks and lock all entries to the well house, including windows. **If well house security is more complex** The interior of the well house is vulnerable to vandalism and unauthorized entry due to _____. Submit a corrective action plan to DOH describing how you will secure the well house against unauthorized entry. **If the well is unprotected from tampering:** Well # __ is located outside the well house in an unsecured setting. Unauthorized individuals may access the well and intentionally or unintentionally disturb the well cap, well casing, and/or power supply, thereby rendering the well inoperable or putting the water supply at risk of contamination. Submit a plan which makes your well a hard target for vandalism and tampering. At a minimum, the well casing should be capped with a sanitary well cap. See DOH Policy M.01 for a list of approved well caps.
Other notes for the sanitary surveyor	If a purveyor says a lock isn't going to stop a dedicated person from gaining access into the well house or a fence/cage over the well head won't deter vandalism, explain that a secured well house/well is a barrier and a marker. Damage to the lock or fence will alert the water system to potential contamination or vandalism, so they can address it in a timely manner. Securing the well house and each well against unauthorized entry is standard practice in the industry, no matter how small or remote the water system. You may need to change the wording above to describe the system's specific situation.

Item 32	Is there a pump control valve or vacuum relief valve without an air gap or screen on the valve discharge pipe?
Guidance	This item always applies to wells with line-shaft turbine pumps and may apply to wells with submersible pumps There must be at least a two-pipe diameter air gap on the pump control valve discharge. Whenever the turbine pump shuts off, the water in the pump column falls back down into the well and, in doing so, pulls air in through the fully open pump-control valve. The air gap will prevent the resulting vacuum from contaminating the well or well discharge piping. A steel mesh must securely cover the open end of the discharge pipe to prevent tampering and keep small animals out. The discharge end should face downward. This same concern applies to any air vacuum relief valve installed on a turbine pump discharge piping system. Make sure there is a screen secured at the end of the air vacuum valve discharge. Wells equipped with large submersible pumps may have a pump control valve to control water hammer. The pump control valve discharge needs an air gap in case the submersible pump check valve fails.
How to mark the checklist	Mark "Yes" if there isn't at least a two-pipe-diameter air gap and screen on a pump control valve or vacuum relief valve discharge.
Classification	Significant Deficiency if marked "Yes."
WAC reference	WAC 246-290-415 (6) WAC 246-290-490
Publications	
Webpage(s)	
Standard language	**No air gap** Install an air gap on the pump control valve discharge line (or vacuum relief valve), and secure a noncorrodible ¼-inch mesh screen over the end of the discharge line. **No screen** Secure a noncorrodible ¼-inch mesh screen over the end of the discharge line.
Other notes for the sanitary surveyor	The pump control valve is on a branch line of the main well discharge to the distribution system. The branch line comes off the main line between the wellhead and the main line check valve. The pump control valve remains wide open while the turbine pump is off. When the pump turns on, air flows through the pump control valve, followed by a strong flow of water. The air discharged when the pump starts up is from the part of the pump discharge column drained of water when the well pump shuts down (the pump discharge column is the pipe connected to the well pump inside the well casing). After the well pump starts, the pump control valve slowly begins to close, allowing water to continue flowing through the pump control valve. As the valve slowly closes, it introduces water into the system in a measured way through the mainline check valve, thus preventing "water hammer." The pump control valve may take up to a few minutes to completely close. When the well pump controller signals the turbine pump to stop, the pump continues to operate but the pump control valve slowly begins to open. This creates a measured decline in flow through the mainline check valve that prevents "water hammer" from a too rapid shutdown. When the pump control valve finally opens up fully (or near fully), the well pump shuts down. When the well pump shuts down, the water in the discharge pipe between the mainline check valve and the well falls back into the well. The air drawn into the open pump control valve relieves the vacuum. If the end of the pump control valve is submerged, it may suck material back into the drinking water supply.

Item 33	**Is the source pump and its control system operated and maintained to prevent chronic water outages or premature pump failure?**
Guidance	If the source pump fails, and there is no other pump or atmospheric storage, the system will quickly depressurize. We want to identify threats that could cause the water system to lose pressure. See examples below.
How to mark the checklist	Mark "Yes" if you believe the pump and pump control system construction, and its current operation and maintenance will prevent chronic water outages or premature pump failure. Mark "No" if you find significant defects in the construction, maintenance or operation of pump and pump controls that present a high risk of equipment failure or failure to maintain pressure in the distribution system. If you Mark "No," describe your findings in the comments section of Part D.
Classification	Significant Deficiency if marked "No."
WAC reference	WAC 246-290-415 (6)
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF) *Drinking Water Tech Tips Pump Controls* 331-401 (PDF)
Webpage(s)	
Standard language	The [describe the problem] poses an unreasonable risk to the reliability of the drinking water supply. Submit a corrective action plan to DOH to address this problem.
Other notes for the sanitary surveyor	Examples of circumstances that can lead to premature pump failure. 1. A pump cycling on/off too frequently will have a short motor life. Each time the motor starts, it generates heat. If the time between start-ups is too short to allow heat to dissipate, the electric motor will eventually overheat, causing motor failure. We suggest no more than six starts per hour unless the operator or owner can prove the pump motor manufacturer claims a greater start-per-hour allowance. 2. Recycling pump discharge through a PRV back to the suction side of the pump at a very low flow rate for extended periods will heat the water. This could cause cavitation, which threatens pump failure. Operating at a low flow rate likely means the pump is operating near its shutoff head (unless it's equipped with a variable frequency drive). This causes an imbalance in the force on thrust bearings, which can cause premature pump failure. 3. Rapid change from low to high flow rate or vice versa (immediate start-up and immediate shutdown) can cause a telltale water hammer. Transient pressure waves that cause banging pipes and equipment can blow fittings and pump casings. 4. Wells that experience significant drawdown or seasonal decline in aquifer level are a potential risk to the well pump. Without a well-level sensing device to shut the well pump off, drawdown to the well pump will cause air to enter the pump, causing cavitation, which could lead to pump failure. Examples of pump controls that could depressurize part or all of the water system. 1. The setting for pump-on and pump-off allows very low pressure in certain parts of the distribution system. 2. The pump control valve isn't working properly, which keeps the pump from coming on or shutting off. Well pump control valves often have limit switches that measure the open or closed position of the valve. If the limit switch isn't set correctly, it can cause the pump to operate outside its intended logic control. *3.* Water logged pressure tanks may cause the pump to over-cycle (see Item 68). If the condition of a pressure tank poses a risk of pumping system failure, mark Item 33 "No," and note this Significant Deficiency under comments in Part H. Read our guidance on *Drinking Water Tech Tips Pump Controls* 331-401 (PDF).

Item 34	**Is the spring box (structure, hatch, and overflow) constructed to keep contaminants or direct surface drainage out?**
Guidance	Look for surface drainage pathways into the spring box. The construction of a spring box hatch (if any) should be similar to a storage tank hatch (see Item 73). Use the same required methods to secure the reservoir roof, vents, and overflows to protect the spring box roof, overflow, and vent (if any). See Items 72 through 76. Secure the structure against shallow surface water seepage (cracked structure, poor fitting pipe passage through structure wall, and so on).
How to mark the checklist	Mark "Yes" if the spring box structure keeps animals, surface drainage or other contaminants out.
Classification	Significant deficiency if marked "No."
WAC reference	WAC 246-290-130, -135 WAC 246-290-235 WAC 246-290-415 (6)
Publications	*Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF) *Sanitary Protection of Reservoirs: Vents* 331-250 (PDF)
Webpage(s)	
Standard language	**You may elaborate on specific measures the system should take, such as modifying the overflow, vent, hatch, or the entire structure. Use the following statements as appropriate.** Protect the end of the overflow pipe with 24-mesh noncorrodible screen or install a flapper valve to keep birds, rodents, or insects out. See the appropriate ways to protect the overflow pipe against contamination in *Sanitary Protection of Reservoirs: Vents* 331-250 (PDF). Repair or replace the access hatch to keep contaminants out. See *Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF). Modify the spring box vent so that it does not permit contaminants to enter the public drinking water supply. See the appropriate standards for finished water storage tank vents in *Sanitary Protection of Reservoirs: Vents* 331-250 (PDF). The construction of the spring box does not provide sufficient protection from entry of surface water or shallow groundwater. Modify the spring box structure for source S0X to make it watertight, so it keeps surface water out. Regrade the surrounding area if surface runoff or standing water next to the spring box could submerge the spring box. Submit electronic photographs to DOH when you complete the improvements.
Other notes for the sanitary surveyor	Using a chlorinator or other means of disinfection, even with ample contact time before the first customer, is not a substitute for securing the spring box to keep contaminants out. The sanitary survey concerns at a spring box may be very similar to those at a wellhead or finished water storage tank. We want to be sure that the spring box is not at risk of submergence or surface water infiltration. We also want to be sure that any spring box appurtenances, such as a hatchway, overflow, or vent, do not permit contaminants to enter the water supply. **The access hatch:** The sides of the hatch should overlap a raised curb and it should close against a gasket for a tight seal. The purveyor must keep the hatch locked. The hatch must keep contaminants out. See *Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF)).

Item 35	Is there a raw-water source sample tap?
Guidance	See Item 27.
How to mark the checklist	Mark "Yes" if there is a raw-water sample tap.
Classification	Significant finding if marked "No."
WAC reference	See Item 27.
Publications	See Item 27.
Webpage(s)	See Item 27.
Standard language	Install a source sample tap as close to S0_ as possible and prior to all treatment facilities, pressure tanks, storage tanks, and prior to entry to the distribution system. The Groundwater Rule requires triggered source monitoring and assessment source monitoring of untreated source water.
Other notes for the sanitary surveyor	See Item 27.

Item 36, 36a, and 36b	**Is the source metered?** **If yes, is the source meter read at least monthly?** **If yes, does the purveyor maintain water production records?**
Guidance	The rules require purveyors to install source meters and record production. A reliable meter, read on a regular basis, will keep the operator and system owner informed about the water they supply to customers. For example, an unexplained change in measured source output is a reason for investigation. A new leak or unauthorized use will show up as an unexplained increase in well production. Declining aquifer levels, well failure or pump problems will show up as an unexplained decrease in pumping flow rate. Operators need this information as soon as possible.
How to mark the checklist	Mark Item 36 "Yes" if a source meter is installed and measuring total production from the source. Mark Item 36a "Yes" if the operator reads the source meter at least once a month. Mark Item 36b "Yes" if your record review confirms that the operator recorded monthly source meter readings at least once a month for the past 12 months.
Classification	Observation if any part of this question is marked "No."
WAC reference	WAC 246-290-130 WAC 246-290-496
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF) *Completing Your Annual WUE Report: Answers to Commonly Asked Questions* 331-459 (PDF)
Webpage(s)	Water Use Efficiency (WUE)
Standard language	**If no source meter:** A water system must install a meter on each source and record water production at least monthly (WAC 246-290-496). Currently, there is no source meter on S0#. Operating a public water supply without a source meter and without the valuable information a meter provides, can be detrimental to system operation. After installing the source meter we recommend that community water system purveyors record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns. **If source meter is not read monthly or is not recorded:** A water system must measure and record water production for each source at least monthly (WAC 246-290-496). We recommend that community water system purveyors record source production daily during the two highest use months and weekly during the rest of the year to better manage and predict water production and water use patterns.
Other notes for the sanitary surveyor	**For community systems:** A source meter, information on water consumption (service meter readings), and estimates of authorized but unmetered uses, will allow the operator to calculate distribution system leakage. **For TNC and NTNC systems:** Routine source meter readings can help an operator identify leaks in a timely manner by providing a baseline for normal use. In addition, source meter data can help a system demonstrate compliance with its water right.

Item 37	Is the springhouse properly constructed and maintained?
Guidance	The springhouse should be: • Constructed of durable materials. • Weatherproof. • Heated if in a freezing climate. • Free of obvious electrical or mechanical hazards. • Free of clutter and readily accessible. • Ventilated, clean and dry. It is safe to enter most springhouses. However, if you consider a springhouse structure unstable or in such disrepair, that entry is unsafe, DO NOT enter the structure.
How to mark the checklist	Mark "Yes" if the springhouse meets all the standards listed above. Mark "No" if the springhouse fails to meet any of the standards listed above.
Classification	Recommendation if marked "No." Identify this as a Significant Finding in the sanitary survey report if the springhouse condition is so bad that it is unsafe to enter. DO NOT enter the structure. Identify and describe the problems in the comments section of Part D, noting classification as a Significant Finding. Photograph the condition of the structure without entering it.
WAC reference	See Item 29.
Publications	See Item 29.
Webpage(s)	See Item 29.
Standard language	**Recommendation** We recommend that you make the following improvements to the springhouse: (List the specific improvements you believe the purveyor should make). **Significant Finding** The springhouse is unsafe to enter. Submit a corrective action plan to repair or replace the springhouse so that it is structurally sound, weatherproof, clean, dry, heated, and free of hazards.
Other notes for the sanitary surveyor	Record observations if there is a risk of freezing (no reliable heat source, insufficient insulation), leaking roof, leaking pipes, standing water, obvious physical or electrical hazards (confined space, unsafe wiring) or severe corrosion. If the springhouse condition compromises security and leaves the structure vulnerable to unauthorized entry, address this through Item 39. Poor ventilation, leaking roofs, or vapors from chlorine disinfection equipment may cause extreme corrosion of pipes, valves, pressure tanks, and controls. The purveyor should practice proper maintenance to protect the spring source facilities against corrosion.

Item 38	Is there any evidence of infestation by rodents or other pests?
Guidance	Avoid contact with rodent feces or urine. If the space appears badly infested, DO NOT ENTER. Otherwise, if you observe any rodent droppings, mark it on the checklist. Photograph the evidence of infestation and any obvious pathway for mice to enter the springhouse.
How to mark the checklist	Mark "No" if you do not observe any sign of mice or other rodent infestation.
Classification	Recommendation if marked "Yes." If the rodent contamination is so bad that it is unsafe, DO NOT ENTER THE STRUCTURE. Identify and describe the problem as a Significant Finding in the comments section of Part D. Photograph the infestation inside the structure without entering it.
WAC reference	
Publications	*Pest Control* 331-363 (PDF)
Webpage(s)	
Standard language	**Recommendation** We recommend that you take the steps necessary to keep rodents out of your facilities. Rodents can carry disease and may create an unsafe working environment. Furthermore, if a direct opening into the source develops, rodents could contaminant the drinking water supply. Your customers expect you to maintain their water system to the highest standards. **Significant Finding** The springhouse is unsafe to enter. Submit a plan to decontaminate the structure of rodent waste and to seal all pathways for rodents to enter the springhouse.
Other notes for the sanitary surveyor	This is your opportunity to educate the purveyor about the public health risks caused by rodents, which include potential drinking water contamination and a health threat for the operator. A rodent infested springhouse suggests poor routine maintenance and operation. We will report the certified operator of a system with a Significant Finding under this item to our Operator Certification and Training Section.

Item 39	**Are the springhouse and spring box protected adequately from unauthorized access?**
Guidance	The purveyor must protect the springhouse from unauthorized access. The springhouse should be built with rigid walls. Tarps covering decayed or damaged walls are unacceptable. The water system must lock or otherwise secure doors and windows against unauthorized entry. There may be other acceptable ways to secure the springhouse. For example, a perimeter fence with a locking gate may replace the need to lock the springhouse.
How to mark the checklist	Mark "Yes" if you believe the springhouse is adequately protected from unauthorized entry.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-415 (6) WAC 246-290-415 (9)
Publications	*Responding to a Threat Against a Water System* 331-183 (PDF) *Water System Security and Emergency Response Planning* 331-199 (PDF)
Webpage(s)	Emergency Response and Security
Standard language	**If the issue is simply ensuring entries to the springhouse are locked.** Secure the springhouse against unauthorized entry. Install locks and lock all entries to the springhouse, including windows. **If the issue of springhouse security is more complex.** The interior of the springhouse is vulnerable to vandalism and unauthorized entry due to _____. Submit a corrective action plan to DOH describing how you will secure the springhouse against unauthorized entry. **If security with the spring box is an issue.** Lock the access hatch cover. The appropriate standard for a storage-tank access hatch is in *Sanitary Protection of Reservoirs: Hatches* (331-249).
Other notes for the sanitary surveyor	If a purveyor says a lock won't stop a dedicated person from gaining access into the springhouse, explain that a secured springhouse is a barrier. Damage to the lock will alert them to potential contamination or vandalism, so they can address it in a timely manner. Securing the springhouse against unauthorized entry is a standard practice in the industry, no matter how small or remote the water system. You may need to change the wording above to describe the system's specific situation.

Item 40	**Is the Sanitary Control Area (SCA) free of unmitigated potential sources of contamination?**
Guidance	If you observe a potential contaminant threat within the sanitary control area (SCA), find out whether DOH already evaluated the threat. Before the survey, review the last sanitary survey letter and checklist to determine whether the last surveyor identified any potential sources of contamination in the SCA. If so, find out whether the purveyor removed the contamination source, developed a DOH-approved mitigation plan, or got DOH approval to reduce the SCA (WAC 246-290-135). Potential threats include a sanitary sewer, septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, storm water treatment swale, nearby surface water, fuel or chemical storage, or fuel pipelines. If you discover that the system failed to take the steps required in the last survey, or currently fails to maintain mitigation, the failure is a Significant Deficiency. In addition, any new (previously unrecorded) potential contaminant threat you find is a Significant Deficiency.
How to mark the checklist	Mark "Yes" if there are no potential sources of contaminant within 200 feet of the spring. Mark "Yes" if there are potential sources of contamination, but you are certain that the purveyor appropriately mitigated the threat or DOH approved a reduction in the SCA. Mark "Unk" if you believe there are subsurface threats within the SCA but you don't know where they are. In the comments section of Part D, describe your reason for requiring the system to submit documentation to DOH. If you provide insufficient reason, we will not consider "Unk" to be a significant finding (see below). Mark "No" for all other circumstances. All "No" answers will trigger a DOH file review before completing the cover letter. The review will determine whether there is history of a mitigation plan approval (including the need for treatment), or past approval for a reduction in the SCA.
Classification	Potential significant deficiency if marked "No," subject to file research and DOH confirmation before completing the cover letter. Significant finding if marked "Unk."
WAC reference	WAC 246-290-135 WAC 246-290-415 (6)
Publications	*Source Water Protection Requirements* 331-106 (PDF) *Wellhead Protection Program Guidance Document* 331-018 (PDF) *Sanitary Control Area Protection* 331-453 (PDF)
Webpage(s)	Source Water Protection
Standard language	**For a biological contaminant hazard that cannot be removed easily (sewer line, septic tank, drain field, irrigation canal or other surface water, waste lagoon, manure pile).** [Name the biological hazard] is in the sanitary control area of Spring X (S0X). Submit a scaled map showing all buildings and potential sources of contamination located within 200 feet of the spring. Include all known information about the type, size, depth, and other construction details of the potential contaminant source. Also, include a copy of the construction details for the spring. Based on the information submitted, DOH will contact you about further follow-up actions that may be required. **For a biological contaminant hazard that can be moved or removed (portable toilet, manure pile).** Remove the [name the item] to a distance greater than 200 feet from Spring X. **For a chemical contaminant hazard that cannot be easily moved or removed (buried fuel tank or fuel lines, above ground bulk fuel or chemical storage).**

Item 40	Is the Sanitary Control Area (SCA) free of unmitigated potential sources of contamination?
	Submit a scaled map showing all buildings and potential contamination sources located within 200 feet of the spring. Include all known information about the type, size, depth and other construction details of the potential contaminant source, including any mitigating design features such as existing spill containment, double-wall construction, and so on. Also, include a copy of the construction details for the spring. Based on the information submitted, DOH will contact you about further follow-up actions that may be required. **For a chemical contaminant hazard that can be moved or removed (household chemicals, fuel cans, pesticides).** Remove the [name the chemical hazard] to a distance greater than 200 feet from Spring X. **If the source is within a developed area and you easily recognize evidence of underground constructed facilities but aren't sure about the location and type of subsurface threats within the SCA (for "Unk").** Send DOH a scaled map indicating the location of all subsurface facilities within the sanitary control area, including sewer lines, storm drains, and any other liquid or gas pipelines; septic tanks and drain fields; buried waste; and abandoned wells. The map should indicate the distance (in feet) from the drinking water supply to the subsurface facility.
Other notes for the sanitary surveyor	Mitigation means one or more provision is in place to decrease the risk of contamination. Acceptable mitigation measures include: Concrete floor (no floor drain) and constructed secondary spill containment for generator fuel stored within the SCA. Grouted, sealed pressure-rated piping sleeve installed around a sanitary sewer line within the SCA. Pressure-rated water main pipe and joints used to convey storm drainage through an SCA. Not all potential contamination sources have the same priority. Moreover, many potential contaminant threats are not significant deficiencies. At one end of the spectrum is a sanitary sewer (especially old clay or concrete), septic tank or drain field, manure storage or application, large animal grazing, storm water dry well, roadway drainage treatment swale, or surface water within the SCA. Find out whether the purveyor has DOH approval to mitigate or reduce such acute contaminant threats in the SCA. If not, we will require the purveyor to eliminate these contaminant sources from the SCA, or to demonstrate that it mitigated the threat appropriately. Treatment to CT6/4-log virus inactivation of the source is also an option for addressing SCA violations (WAC 246-290-451). At the other end of the spectrum is a light application of herbicide or a parked car that might leak motor oil or other fluids. These chronic contaminants aren't an immediate health risk. The scale of the potential chronic threat is important. Is it one car or fifty junk cars near the well? Is the area treated and amount of weed killer used small or is it applied on an industrial scale? If you think the chronic contaminant threat is small, mark this checklist item "Yes," but note what you saw and why you believe the risk to the water supply is minor.

Checklist Part E: Disinfection

This section focuses on disinfection of drinking water supplies using chlorine or UV light. Most purveyors use disinfection treatment at the source, so they can link the treatment dosage closely to the rate of flow from the well and ensure treatment of all the water entering the system.

Chlorine is a very common disinfectant in drinking water. In Washington, more than 1,000 small water systems add chlorine to one or more drinking water sources. Purveyors also may use chlorine to support other treatment objectives, such as removing iron and manganese or reducing taste and odor problems.

A much smaller number of systems use UV disinfection.

There are three groundwater disinfection treatment objectives.

1. Appropriate source treatment for each groundwater source with *E. coli* detected in the source water. Since 2010, detection of *E. coli* in a groundwater source triggers a 4-log virus treatment requirement under the Groundwater Rule (GWR).
2. Appropriate source treatment for each groundwater source with known total coliform contamination if characteristics reflect one of the following:
    - A heightened level of risk to microbial contamination.
    - Using seawater RO sources.

These are state-mandated 4-log virus treatment circumstances.

3. Appropriate source treatment is needed to provide a measureable chemical residual in the distribution system at all times (usually free chorine). A repeated violation of the total coliform MCL usually drives this requirement. These are **distribution system residual** treatment circumstances.

Most purveyors satisfy the 4-log virus treatment requirement by achieving CT6 disinfection through chlorination prior to the first customer. If DOH determines the source water to be colder than 50 degrees F, then we may increase the level of required treatment to CT8. No small system uses UV to satisfy this requirement.

"CT6" is an abbreviation for free chlorine *Concentration* (mg/l) times *Time* (minutes). The concentration is the measure of free chlorine at the end of the contact time. The time is the number of minutes the water is in contact with free chlorine before the first customer, calculated during peak flow. To achieve 4-log (99.99%) virus inactivation, C x T must be equal to or greater than six. For groundwater supplies subject to unusually cold groundwater temperature (less than 50 degrees F), the required level of treatment will be greater than described above.

Our highest priority for groundwater disinfection is to be sure that purveyors operate sources with a 4-log treatment requirement in a manner consistent with effective and reliable treatment.

Topics to describe in the comments section of Part E.

- Describe the chlorination facilities, including purpose for chlorination.
- Concerns with maintenance or operations.
- Purveyor's recordkeeping of monthly reports.
- Sanitary and security observations.

Item 41	**Does the operator batch chlorinate the source, the distribution system or the reservoir just before collecting routine or repeat coliform samples?**
Guidance	"Batch" or "shock" chlorination is dumping a slug of chlorine into the water system. This is an appropriate practice after an event threatens water quality. However, it is not an acceptable routine practice if it interferes with collecting representative coliform samples from the distribution system. Operators may not add chlorine before collecting routine coliform samples because doing so creates an unrepresentative condition in the distribution system. It's cheating. Likewise, dumping chlorine into the water system right after an unsatisfactory coliform sample, and before repeat coliform samples are collected, violates WAC 246-290-320 (2).
How to mark the checklist	Mark "Yes" or "No," based on the operator's response to the question.
Classification	If marked "Yes," a referral will be made to the DOH Operator Certification and Training Section (if the operator is certified) or to the regional office (if the operator is not certified) for follow-up.
WAC reference	WAC 246-290-300 (3) WAC 246-290-320 (2) WAC 246-290-415 (6)
Publications	*Follow-up to an Unsatisfactory Coliform Sample* 331-187 (PDF)
Webpage(s)	
Standard language	DOH may contact you to inquire further into your practice of batch chlorinating the system just prior to collecting your routine and repeat coliform samples. If continuous chlorination is required to ensure water quality, please contact your regional office for procedures for installing permanent continuous chlorination.
Other notes for the sanitary surveyor	If the operator practices batch chlorination, try to find out whether it's an innocent misunderstanding of the regulation, or an intentional circumvention. If it's the latter, note your findings under comments in Part L. In either case, tell the operator to stop the practice because it could be masking serious contamination problems that put public health at risk. Explain that this is a serious concern and let the operator know that you will refer it to us.

Item 42	Did you observe disinfection treatment connected to the water system in active use that is NOT listed on the WFI?
Guidance	A purveyor must accurately list all forms of treatment it uses on its Water Facilities Inventory (WFI). Disinfection treatment has implications for the purveyor's coliform and disinfection byproducts monitoring and reporting requirements.
How to mark the checklist	Mark 42 "Yes" if you observe an operational disinfection process that's not listed on the WFI (see WFI box 21).
Classification	Observation if marked "Yes."
WAC reference	WAC 246-290-110, 120 WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Purveyors must obtain written DOH approval before constructing water system improvements, such as disinfection facilities (WAC 246-290-120 (2)). Submit to us as-built design information for the disinfection treatment process. Contact your regional engineer for submittal requirements.
Other notes for the sanitary surveyor	Surveyors should check with us about the purveyor's disinfection treatment approval status before completing the sanitary survey cover letter and checklist.

Item 43	Is ultraviolet light (UV) used to disinfect a drinking water source?
Guidance	Small water systems usually use UV disinfection for groundwater supplies when the owner wants to address a source contamination problem while trying to avoid adding chlorine. Many of the UV systems you will encounter are not ODW-approved. The typical small UV unit is effective at inactivating bacteria, but less so at inactivating viruses. Because water systems sample only for coliform bacteria and not for viruses, they view the use of UV as successful treatment. DO NOT assume that, 1) we approved the in-place UV treatment; or 2) UV is suitable mitigation for the microbiological threat within the SCA.
How to mark the checklist	Mark "Yes" if a source is treated with UV disinfection.
Classification	Recommendation.
WAC reference	
Publications	*Alternate Disinfectants* 331-252 (PDF)http://www.doh.wa.gov/portals/1/Documents/pubs/331-252.pdf *Water System Design Manual* 331-123 (PDF) Appendix I
Webpage(s)	
Standard language	We recommend you contact us to discuss your UV unit and alternative treatment options. Your existing UV unit may provide a sufficient dose to kill coliform bacteria, but it might not be effective in inactivating viruses that may be present in your source water. Most UV units provide only about 20 percent of the recommended dose to inactivate viruses.
Other notes for the sanitary surveyor	Small water systems supplied by groundwater may operate UV disinfection on one or more sources, but it's very unlikely that ODW-approved the UV unit to provide 4-log virus inactivation. Small systems usually install UV because they want to avoid installing chlorine disinfection after past repeated coliform violations. A purveyor likely installed UV because of a concern over source contamination. It's important to remember that a source contamination problem requires disinfection sufficient to achieve 4-log inactivation of virus, because viruses may be present in sources contaminated with coliform bacteria. We recommend that UV installations provide a UV dose of at least 186 mJ/cm2 to ensure destruction of viruses that may be present in a contaminated source. Most UV units provide only about 20 percent of the recommended dose, and are insufficient to destroy viruses that may be present in the source water. We rarely approve UV treatment of a contaminated groundwater supply, especially for small systems. This is because the approval process and criteria is very complex compared to the requirements needed to achieve 4-log virus inactivation with chlorine. See Appendix I in the *Water System Design Manual* 331-123 (PDF). We will not approve UV in response to repeated total coliform violations in the distribution system because UV carries no residual into the distribution system.

Item 44	**Is the UV unit sized for the maximum flow rate, and is there a UV transmittance sensor controlling a solenoid valve or other device to shut off supply if the UV light fails?**
Guidance	The effectiveness of UV disinfection relies entirely on irradiating the water as it passes by the UV light. Improper flow rate, dirty glass ("quartz") sleeve, or a burned-out light all interfere with the rated UV dose the unit applies to the water. Excessive flow rate will reduce the time the water is in contact with UV radiation. A dirty quartz sleeve around the UV light will interfere with the passage of UV radiation to the water. A burned out UV light will impart no UV dose to the water. Check the flow rate into the UV unit. Is it equal to or less than the rated capacity of the unit? Check for a sensing device that reads the level of UV radiation transmitted across the diameter of the UV unit (look for a wire connected to the body of the UV unit). Does the sensor wire connect with a solenoid valve that will shut the water off if the sensor detects insufficient or no UV dose to the water? (A dirty quartz sleeve or burned out UV light could cause this shut off.) Ask how often the UV light is replaced. It should be replaced every 12 months.
How to mark the checklist	Mark "Yes" if there is, 1) a flow control device that prevents flow into the unit from exceeding its rated capacity; **and** 2) a UV transmittance sensor tied to a solenoid valve.
Classification	Recommendation if marked "No."
WAC reference	
Publications	
Webpage(s)	
Standard language	Use one or more of the following statements, as applicable. We recommend that you: • Install a flow control device so that the flow through the UV unit doesn't exceed the rated capacity of the unit. • Install a UV transmittance sensor and solenoid valve so that the device will stop flow through the unit if the UV light fails. • Replace the UV light every 12 months.
Other notes for the sanitary surveyor	If the purveyor operates the UV unit beyond its rated capacity (gpm), the water will move through the UV unit too fast—reducing the radiation dose. If the purveyor cannot identify the rated capacity of the unit, it's impossible to know whether the flow through the unit is within the unit's rated treatment capacity. A flow control valve allowing flow equal to or less than the UV unit's rated flow capacity will ensure an appropriate flow rate through the UV unit. Find out whether the operator cleans the quartz sleeve at least once a month (look for a squeegee device that allows cleaning while the unit is in service). This is especially important if there is no UV transmittance sensor to identify when the unit doesn't apply a sufficient radiation dose to the water. Ask the purveyor how often the manufacturer recommends replacing the UV light. The purveyor **should not** wait unit the UV light burns out to replace it.

Item 45	Describe the UV equipment
Guidance	Record the manufacturer, model number, rated capacity (gpm), and recommended frequency for cleaning the quartz sleeve and replacing the UV light.
How to mark the checklist	Complete the checklist based on best available information provided during the survey.
Classification	Informational
WAC reference	
Publications	
Webpage(s)	
Standard language	None
Other notes for the sanitary surveyor	

Item 46 and 46a	**Is there continuous chlorination?** **If yes, please measure the free chlorine residual from a representative location in the distribution system.**
Guidance	There are three reasons for a purveyor to provide continuous chlorination to one or more source to: 1. Maintain a free chlorine residual in the distribution system and maintain water quality in the distribution system. 2. Provide 4-log virus treatment of a source before it enters the distribution system (99.99% inactivation). This is called "CT6" treatment (see Item 51). 3. Support the primary goal of treatment (proper removal of iron, manganese or arsenic may require an oxidant like chlorine).
How to mark the checklist	Mark Item 46 "Yes" if the purveyor operates a chlorine injection system to treat one or more source. Note the reason for continuous chlorination in the comments section of Part E.
Classification	Informational.
WAC reference	WAC 246-290-300 (6) WAC 246-290-451
Publications	*How to Handle Chlorine Gas Safely* 331-364 (PDF) *Small Water Systems Chlorination Controls* 331-398 (PDF) *Measuring Free Chlorine* 331-442 (PDF)
Webpage(s)	Chlorination of Drinking Water
Standard language	None.
Other notes for the sanitary surveyor	Use your own chlorine test kit to measure the free chlorine residual in the distribution system. Then ask the operator to measure free chlorine at the same location(s), so you can compare and record both results. **Do not** measure for total chlorine. Total chlorine includes free chlorine **plus** combined chlorine. Free chlorine is the chlorine residual that can effectively disinfect against microorganisms. Combined chlorine is a weak and relatively ineffective substitute for free chlorine. Check the operator's chlorine test kit, the reagent expiration date, and the reagent sample size in relation to the volume of water the operator added to the reagent. Reagent "pillows" are designed for a specific sample volume (5 ml, 10 ml and so on).

Item 47	**Is there a water supply line plumbed directly into a chlorine solution tank without a reduced pressure backflow assembly on the supply line?**
Guidance	This is a high-risk cross connection. There should be an air gap or reduced pressure backflow assembly between the supply line and the chlorine solution tank. Without the appropriate backflow protection, a negative pressure event could siphon the content of the chemical solution tank into the supply line creating a health hazard.
How to mark the checklist	Mark "No" if there is no chlorine solution tank. Mark "No" if there is a chlorine solution tank but there is no potable water supply pipe or hose plumbed into the solution tank. Mark "No" if there is a chlorine solution tank, there is a potable water supply pipe or hose plumbed into the solution tank, and there is a reduced pressure backflow assembly on the potable water supply pipe to the solution tank.
Classification	Significant deficiency if marked "Yes."
WAC reference	WAC 246-290-415 (6) WAC 246-290-490
Publications	
Webpage(s)	
Standard language	Install an air gap or reduced pressure backflow assembly on the water supply line to the tank. The cross connection with the chlorine solution tank represents a high risk for contamination of the drinking water supply.
Other notes for the sanitary surveyor	Take a picture of the reduced pressure backflow assembly (if applicable).

Item 48	**Is there a post-treatment sample tap?**
Guidance	Operators must take all source samples for analytes, such as VOCs, IOCs, radionuclides, and SOCs at the source prior to entry into the distribution system and **after** treatment. This post-treatment sampling will detect changes in the analytes that occur after treatment (adding a chemical or physical change).
How to mark the checklist	Mark "Yes" if there is a post-treatment sample tap located prior to entry to the distribution system.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-300 WAC 246-290-415 (6)
Publications	*Inorganic Chemical (IOC) Sampling Procedure* 331-221 (PDF)
Webpage(s)	
Standard language	Install a sample tap after all forms of water treatment at S0_. You must be able to collect a post-treatment water sample prior to entry to the distribution system to comply with routine source monitoring requirements in chapter 246-290 WAC.
Other notes for the sanitary surveyor	The operator should only use a sample tap under the direct control of the water system as the post-treatment sample tap. A sample tap at or within 12 inches of the floor or ground is vulnerable to contamination. It is too close to contaminated surfaces. Any water, cleaning products or other sprays directed at the surfaces may splash back to the tap.

Item 49	**Does the chlorine compound meet NSF/ANSI Standard 60? Household bleach is exempted.**
Guidance	Product containers display the NSF/ANSI listing on the label. If the chlorine product comes in a container or packaging that does not display the NSF/ANSI certification, record the manufacturer and the product name in the comment section of Part E. Standard household bleach (i.e., dilute sodium hypochlorite free of dyes, colorants, fragrances, surfactants, and acrylics) is exempt from the NSF 60 requirement.
How to mark the checklist	Mark "Yes" if, (1) you are certain the chlorine compound is listed under NSF/ANSI Standard 60; or (2) the chlorine used is standard household bleach without dyes, color or surfactants. Mark "No" if, (1) you know or suspect the chlorine compound isn't listed under NSF/ANSI Standard 60; (2) the product label lists ingredients such as dyes, color, fragrance, acrylics, or surfactants; or (3) if the product label lists "other ingredients" in addition to sodium hypochorite.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-220 WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Stop adding chlorine compounds not listed under NSF/ANSI Standard 60 to the drinking water supply and submit documentation that the compound to be used is certified under ANSI/NSF Standard 60.
Other notes for the sanitary surveyor	Regardless of the source of chlorine (retail or commercial strength liquid bleach or calcium hypochlorite "bleach powder" or "HTH" pool bleach disks), check the product label to see if it meets NSF/ANSI Standard 60. If so, it is an acceptable additive for drinking water. Look for the NSF stamp on the product or paperwork. **Example of NSF60 Certification mark**  **Example (Cloromax) of an uncertified chlorine product (contains acrylics)**  **Special Note on Dichlor and Trichlor** Make note in the comment section of Part E if the purveyor is using Dichlor (dichloroisocyanuric acid) or Trichlor (trichloroisocyanuric acid) as a disinfectant. **We do not want water systems to use these compounds as drinking water disinfectants**, even though they are NSF 60 certified. In water, Dichlor and Trichlor break down into free and combined chlorine and chlorinated cyanurates. We will follow up with the water system.

Item 50	Are a backup chemical feed pump or other critical spare parts available onsite?
Guidance	Effective disinfection of the drinking water supply requires continuous treatment. Therefore, unless the purveyor has redundancy of supply through multiple sources or very large reservoir capacity, a spare chemical feed pump is necessary to continue treatment when the operational feed pump is out of service for repair or maintenance.
How to mark the checklist	Mark "Yes" if the purveyor has a functional spare chemical feed pump ready to put into service if an operating feed pump breaks or requires maintenance.
Classification	Recommendation if marked "No."
WAC reference	
Publications	
Webpage(s)	
Standard language	We recommend you purchase and maintain a complete spare chlorine injection pump assembly, including injection valve, tubing, pump, and discharge head.
Other notes for the sanitary surveyor	Chemical feed pumps are relatively inexpensive, and require relatively frequent maintenance (cleaning internal wetted parts to remove scale; replace diaphragm; and so forth). The purveyor should keep a full set of the manufacturer's spare parts to maintain the spare pump in service-ready condition. You can ask an operator about the bacteriological quality of the source water and the risks that a disinfection chemical feed pump malfunction would create. Planning for emergency conditions, such as chlorination failure, should be part of an Emergency Response Plan.

Item 51 and Item 51a	**According to the operator, is there a DOH requirement for Chlorine Contact Time? If yes, measure the free chlorine residual at the contact time compliance location.**
Guidance	Ask the operator if any source is subject to a chlorination treatment technique requirement known as "CT6" or "4-log virus inactivation." If it is, measure the chlorine residual at the CT compliance sampling location. The compliance sampling location must be prior to the first service connection. Then ask the operator to perform the same measurement with his or her own testing apparatus. Record both results under comments in Part E.
How to mark the checklist	Mark Item 51 "Yes" if the purveyor operates a continuous chlorination system and we assigned a CT6/4-log virus treatment requirement. If you mark "Yes," measure the free chlorine residual at the contact time compliance location.
Classification	A referral to our regional engineer for follow-up if marked "Yes" **and** the measured chlorine residual is insufficient to achieve the required CT value for 4-log virus disinfection before the first customer.
WAC reference	WAC 246-290-451
Publications	*Measuring Free Chlorine* 331-442 (PDF) *Chlorine Contact Time for Small Water Systems* 331-343 (PDF)
Webpage(s)	
Standard language	Based on my measurements, I have concerns about the level of disinfection treatment provided prior to the first connection. We may contact you to inquire further into the level of disinfection achieved prior to the first connection.
Other notes for the sanitary surveyor	"CT6" means the chlorine concentration (C) multiplied by contact time (T) must be equal to or greater than six. A value of six is sufficient to provide 4-log (99.99%) inactivation of virus in groundwater if the water temperature is at least 50 degrees. Colder water temperature requires a higher CT value to achieve 4-log inactivation of virus. Example: **Free** chlorine residual of 0.3 mg/l times 20 minutes of contact time between the point of chlorine injection to a point prior to the first connection under peak flow conditions equals six. A source with a CT6 treatment requirement is most vulnerable to microbiological contamination, and therefore is a high priority for DOH. Such a source has one of the following. • Previously demonstrated vulnerability to fecal contamination as evidenced by *E. Coli* found in a source water sample. • Previously demonstrated total coliform contamination as evidenced by total coliform found in multiple source water samples. • Microbiological contaminant sources in the sanitary control area and, as a condition of continued operation of the well, the purveyor must provide CT6 treatment. • A groundwater source determined to be in hydraulic connection with surface water. • Seawater treated to potable water standards by reverse osmosis. If the operator doesn't know the required value for free chlorine at the contact time compliance location, or the operator seems unconcerned or confused about the required treatment objective, explain that this this is a serious concern that you will refer to us.

Item 52	**Is the chlorine pump and its control system constructed and maintained to provide uninterrupted, reliable CT6 treatment?**
Guidance	DOH routinely reviews CT6 monthly operational reports purveyors submit to determine compliance with monitoring and treatment technique requirements. If these reports signal a problem, we follow up. However, looking forward in time, these reports do not tell us whether the treatment process will continue to meet its treatment objectives reliably. We want to prevent interruptions in treatment rather than respond after they occur. Look for significant threats to the reliable operation of the disinfection system (see below).
How to mark the checklist	Mark "Yes" if you believe the chlorination system is currently constructed, operated, and maintained to reliably meet its treatment objective. If you mark "No," describe your reasons in the comments section of Part E.
Classification	A referral for follow-up by the DOH regional engineer if marked "No."
WAC reference	WAC 246-290-451
Publications	*Preventive Maintenance Program: Guide For Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	Based on my observations, I have concerns about the reliability of the CT6 disinfection treatment process. We may contact you to inquire further into the condition and operation of your CT6 disinfection treatment system.
Other notes for the sanitary surveyor	Reliability of a CT6 treatment process is a very high priority for us. Please record concerns you have about anything to do with the construction, operation or maintenance of a CT6 treatment system. Explain your concerns to the operator and let them know that you will relay your concerns to us. The following is a sample list. • Chlorine solution tank is allowed to run dry before re-filling. • The chlorination system operates with a fixed pumping rate, but the water supply it treats flows at a variable rate. • Look for air locking on the discharge tubing. The chemical feed pump may continue to operate, but nothing is pumped if the discharge tubing is air locked. • Excessive sediment around the foot valve at the bottom of the chlorine solution tank. • Leaks at the pump head or discharge pipe. • Excessively slow pump frequency (anything less than 20% speed).

Checklist Part F: Other Treatment

Third-party surveyors may encounter groundwater treatment other than disinfection such as iron and manganese removal, corrosion control, or blending. Treatment other than disinfection is intended to reduce the level of contaminants in drinking water.

Three categories of contaminants give surveyors an indication of the priority they should apply to resolving treatment reliability issues.

- **Primary acute:** Health-based standard. May harm human health due to short-term exposure (small amount, even a single dose of water). Examples in groundwater systems include *E. Coli,* viruses, and nitrate.
- **Primary chronic:** Health based standard. May harm human health due to long-term exposure (lifetime). Examples include lead, copper, arsenic, and fluoride.
- **Secondary:** Aesthetic based standard. Examples include sulfate and sulfide (rotten egg odor), iron and manganese (odorous, discolored), and chloride (saltwater intrusion).

Topics to Describe in the Comments Section of Part F

- Treatment facilities.
- Purpose for treatment.
- Concerns with maintenance or operations.
- Purveyor's recordkeeping of monthly reports.
- Sanitary and security observations.

Item 53	**Is there any treatment other than chlorination or UV in use?**
Guidance	Other treatment includes iron, manganese, nitrate, and arsenic removal; addition of fluoride (for dental health); pH or alkalinity adjustment (for corrosion control); brackish groundwater treatment (by reverse osmosis); aeration (for hydrogen sulfide or corrosion control); and blending two or more sources before entry to the distribution system.
How to mark the checklist	Mark Item 53 "Yes" if there is any treatment other than chlorination or UV in use.
Classification	Informational.
WAC reference	WAC 246-290-110 and 120 WAC 246-290-480
Publications	
Webpage(s)	
Standard language	None.
Other notes for the sanitary surveyor	Confirm that the treatment process is on the WFI. The pre-survey data packet provides a summary of the treatment processes currently in Sentry (see Section 3.3.2).

Item 54	**Did you observe a treatment process connected to the water system in active use that is NOT listed on the WFI?**
Guidance	All source treatment information in Sentry is in the pre-survey data packet.
How to mark the checklist	Mark "Yes" if you observe an operating treatment process not listed in the pre-survey data packet. **Check with us about the undisclosed treatment process before you complete the sanitary survey cover letter. In most cases, "yes" means the purveyor should disconnect the treatment process from the water system. However, there could be exceptions.** It is possible we actually approved the treatment process but it was not listed on the WFI, in which case disconnection is not necessary. It is possible, depending on the specific circumstances, that we will allow the treatment process to remain operational until the purveyor obtains written approval because we believe continuous treatment has significant public health benefits.
Classification	Significant finding if marked "Yes."
WAC reference	WAC 246-290-110, 120 WAC 246-290-250 WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	**If after checking with DOH, the decision is to disconnect the treatment system.** Immediately discontinue use of the unidentified treatment system, physically disconnect the treatment system from the distribution system, and contact our regional engineer for further information on obtaining approval of the treatment system.
Other notes for the sanitary surveyor	

Item 55	**Is there a water supply line plumbed directly into a chemical solution tank without a reduced pressure backflow assembly on the supply line?**
Guidance	This is a high-risk cross connection. There should be an air gap or reduced pressure backflow assembly between the water supply line and the chlorine solution tank. Without the appropriate backflow protection, a negative pressure event could siphon the content of the chemical solution tank into the supply line, creating a health hazard.
How to mark the checklist	Mark "No" if there is no chemical solution tank. Mark "No" if there is a chemical solution tank but there is no potable water supply pipe or hose plumbed directly into the solution tank. Mark "No" if there is a chemical solution tank, there is a potable water supply pipe or hose plumbed directly into the solution tank, and there is a reduced pressure backflow assembly on the potable water supply pipe to the solution tank.
Classification	Significant deficiency if marked "Yes."
WAC reference	WAC 246-290-415 (6) WAC 246-290-490
Publications	
Webpage(s)	
Standard language	Install an air gap or reduced pressure backflow assembly on the water supply line to the tank. The cross connection with the chemical solution tank represents a high risk for contamination of the drinking water supply.
Other notes for the sanitary surveyor	Take a picture of the reduced pressure backflow assembly (if applicable).

Item 56	**Are primary contaminant treatment facilities (nitrate, corrosion control, arsenic) operating properly?**
Guidance	This is a wide open question. Consider the following. 1. Observe the condition of the facilities for leaks, vibration, inoperable gauges, and sensors. 2. Inquire about the system's operational reliability, operational controls, alarms, alarm set points, and alarm testing. 3. Identify the presence of a treatment by-pass and how/when is it used. 4. Describe where field and compliance (lab) samples are collected and under what conditions. 5. Confirm that any chemicals and media materials in use are NSF/ANSI Standard 60 and 61 approved. 6. Confirm that O&M is performed as needed (such as the correct backwash frequency, duration, flow; appropriate process control on chemical feed). 7. Confirm that treatment backwash (if any) doesn't represent a cross-connection hazard.
How to mark the checklist	Mark "Yes" if you believe the treatment system is currently constructed, operated, and maintained to reliably meet its treatment objective. Mark "No" if you discover significant defects in the construction, maintenance or operation of the facility that present a high risk of equipment failure, failure to remove the contaminant reliably, or other threat of contamination to the drinking water supply. If you Mark "No," describe in the comments section of Part F in the checklist.
Classification	Significant deficiency if marked "No."
WAC reference	WAC 246-290-415 (4), (5), (6) WAC 246-290-455 (1)
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	The [describe the problems] pose an unreasonable risk to the safety of the drinking water supply. Submit your action plan to address this problem to DOH.
Other notes for the sanitary surveyor	Check the treated water quality data. Take note if the data indicates a history of unreliable treatment, and inquire about possible reasons for this. Your input to this question is important, even if treated water quality data indicates safe and reliable results.

Item 57	Do the water treatment chemicals meet NSF/ANSI Standard 60?
Guidance	Product containers will display the NSF/ANSI listing on the label. If the product used as an additive to drinking water comes in a container or packaging that does not display the NSF/ANSI certification, record the manufacturer and product name in the comment section of Part F.
How to mark the checklist	Mark "Yes" is you are certain the chemicals used are listed under NSF/ANSI Standard 60 (standard household bleach excepted). Mark "No" if the purveyor cannot provide confirmation that the product used is listed under NSF/ANSI Standard 60.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-220 WAC 246-290-415 (6)
Publications	
Webpage(s)	Listing Category Search Page | NSF International
Standard language	Stop adding chemical compounds not listed under NSF/ANSI Standard 60 to the drinking water supply and submit documentation that the compound is certified under ANSI/NSF Standard 60.
Other notes for the sanitary surveyor	

Item 58	Is there a post-treatment sample tap?
Guidance	Operators must take all analyte samples at the source prior to entry into the distribution system **and after** treatment (VOCs, IOCs, radionuclides, and SOCs). Post-treatment sampling confirms changes in the analytes after treatment (adding a chemical or physical change).
How to mark the checklist	Mark "Yes" if there is a post-treatment sample tap located prior to entry to the distribution system.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-300 WAC 246-290-415 (6)
Publications	*Inorganic Chemical (IOC) Sampling Procedure* 331-221 (PDF)
Webpage(s)	
Standard language	Install a sample tap after all forms of water treatment at S0_. You must be able to collect a post-treatment water sample prior to entry to the distribution system to comply with routine source monitoring requirements in chapter 246-290 WAC.
Other notes for the sanitary surveyor	The operator should only use a sample tap under the direct control of the water system as the post-treatment sample tap. A sample tap at or within 12 inches of the floor or ground is vulnerable to contamination. It is too close to contaminated surfaces. Water, cleaning products or other sprays directed at the surface may splash back to the tap.

Checklist Part G: Booster Pumps and Controls

Pumps supply the energy required to transport water from the source or intermediate reservoir to consumers under optimum pressure. Most wells and booster pumps used in water systems are centrifugal, including the common submersible or line-shaft turbine pumps in almost all wells and the close-coupled horizontal pumps at booster pump stations. A centrifugal pump consists of an impeller rotating within a case. Practically all submersible and line-shaft turbine use multiple stages of impellers. Each stage "pumps" water to the next, to create the right amount of pressure needed to deliver the water from the source to each consumer.

The impeller rotates when electrical energy in a motor turns a shaft connected to the impeller. The reference to a "10-horse pump," refers to the power of the motor connected to the impellers. The amount of horsepower needed depends on the required flow into the water system and the pressure required when it reaches customers.

A system may install one pump coupled to a 10-hp motor to deliver a relatively small amount of water up to a very high pressure. A different pump coupled with a 10-hp motor may deliver a large amount of water up to a relatively low pressure. The specific requirements of the source and the water system drive the selection of the pump. The size of the motor depends on the pump selected.

Control Systems Start and Stop Pumps

Pump control for a system operating with pressure tanks depends on pressure. When the pressure reaches a pre-set high value, the pump shuts off automatically. When the pressure reaches a pre-set low value, the pump starts automatically.

Pump control for a system operating with a storage tank not under internal pressure depends on the water level in the tank. When the water level reaches a pre-set high level, the pump shuts off. When the water level reaches a pre-set low level, the pump starts.

While pumps are big, expensive, and sometimes noisy, control systems are usually quite small, inexpensive, and virtually silent. A pressure switch controlling a $4,000 pump might cost $25. The level control in a storage tank controlling a 50 horsepower pump might cost $50 and be disabled the next time ice forms in the tank. It's important to pay attention to what starts and stops a pump.

Pump failure may increase the risk of contamination and create considerable inconvenience to the community served. This is especially true for a small system with a single well and pressure tanks. Within moments of well pump failure, the system will lose supply and pressure. Pressure loss increases contaminant risks from uncontrolled cross connections in the distribution system. Pressure loss events also prompt purveyors and consumers to seek an alternative water supply.

Pump failure may not be as critical if the system has multiple sources or a finished water storage tank large enough to supply consumers by gravity until the purveyor repairs or replaces the pump.

Topics to Describe in the Comments Section of Part G.

- Describe and evaluate pump facilities and controls. Include maintenance and operation.
- Sanitary and security observations.

Item 59	Are there any booster pumps in use?
Guidance	Include booster pumps but not source pumps. Do not include small pumps used exclusively for treatment. You will address chemical feed pumps in the treatment section of the checklist.
How to mark the checklist	Mark "Yes" if at least one booster pump must operate to maintain an adequate level of service in the distribution system during peak demand periods and fire flow events.
Classification	Informational.
WAC reference	
Publications	
Webpage(s)	
Standard language	None.
Other notes for the sanitary surveyor	Many water systems, because of supply limitations, treatment, topography, or high demand need booster pumping facilities. For these water systems, booster pumps are an integral component of the distribution system—like the water mains themselves—that must be adequate in capacity and reliable. Inadequate or unreliable booster pumping facilities leave a water system vulnerable to inadequate pressure, customer complaints, and place the distribution system at risk of contamination. Booster pump facilities should provide the water system with adequate and resilient capacity that protect the quality of water in the distribution system while delivering needed supply to consumers over a wide range of operating conditions. Booster pumps work with pressure tanks, atmospheric storage tanks, variable frequency drives, and control valves to maintain a consistent pressure range in the distribution system.

Item 60	Are the booster pumps in good working condition?
Guidance	Look for: • Excessive vibration (evidence of misaligned shaft, pump impeller imbalance, or motor imbalance). • A deep swishing noise coming from the pump casing (possible cavitation). • Excessive water leakage around the pump shaft seals. Some water leakage is necessary, but excessive leakage indicates that the mechanical seals or packing material may need replacement. • Inadequate structural support for pumps (broken concrete pump pedestals, missing anchor bolts, insufficient pipe support around the pump suction and discharge). • Sparking from the pump motor. • The smell of something burning. • History (told by the operator) of motor overheating (tripping the breaker).
How to mark the checklist	Mark "Yes" if you believe the booster pumps are in good working condition.
Classification	Recommendation if marked "No."
WAC reference	
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	Your booster pumps appear to be in poor condition. We recommend you [state the solution] your booster pumps to maintain safe and reliable operations.
Other notes for the sanitary surveyor	This item is a precursor to Item 61, which examines whether the booster pumping system is reliable and able to maintain reliable water service.

Item 61	**Is the pump and its control system operated and maintained to prevent chronic water outages or premature pump failure?**
Guidance	If a booster pump fails, the system will quickly depressurize unless it has another pump ready to operate or elevated atmospheric storage. We want to find threats that could depressurize a water system.
How to mark the checklist	Mark "Yes" if you believe the pump and pump control system is currently constructed, operated, and maintained to prevent chronic water outages or premature pump failure. Mark "No" if you observe significant defects in pump or pump control construction, operation, or maintenance that could cause equipment failure or pressure loss in the distribution system. See examples below. If you mark "No," describe your observations in the comments section of Part D.
Classification	Significant Deficiency if marked "No."
WAC reference	WAC 246-290-415 (6)
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF) *Drinking Water Tech Tips Pump Controls* 331-401 (PDF)
Webpage(s)	
Standard language	The [describe the problems] pose an unreasonable risk to the reliability of the drinking water supply. Submit your corrective action plan to address this problem to us.
Other notes for the sanitary surveyor	**Examples of circumstances that can lead to premature pump failure.** • A pump cycling on/off too frequently shortens motor life. Heat generates each time the motor starts. If the time between start-ups is too short for heat to dissipate, the motor will overheat, causing motor failure. We suggest no more than six starts per hour unless the purveyor proves the pump manufacturer claims a greater start-per-hour allowance. • Recycling pump discharge through a PRV back to the suction side of the pump at a very low flow rate for extended periods will heat the water. This increases the cavitation risk, which threatens pump failure. Operating at a low flow rate likely means the pump is operating near its shutoff head (unless equipped with a variable frequency drive). This causes imbalances of forces on thrust bearings, which can cause premature pump failure. • Rapid change from low to high flow rate or vice versa (immediate start-up and immediate shutdown) can cause a telltale water hammer. Transient pressure waves that cause banging pipes and equipment can blow fittings and pump casings. • Net positive suction head (NPSH) is on the suction side of the pump. Pumps need NPSH to function. If the reservoir level or distribution system pressure drops too low, the pump will continue to operate but it will pull air. Cavitation may occur, leading to pump failure. **Examples of pump controls that can cause pressure loss in part or all of the water system.** • The pump-on and pump-off setting allows very low pressure to occur within certain parts of the distribution system. • "Water logged" pressure tanks cause pumps to over-cycle (See Item 68). If the condition of a pressure tank could cause the pumping system to fail, mark this item "No" and note this Significant Deficiency in the comments section of Part H.

Item 62	**If there is a booster pump house or pump station, is it secure against unauthorized entry?**
Guidance	The purveyor must protect the booster pump house against unauthorized access. The booster pump house should be built with rigid walls. Tarps covering decayed or damaged walls are unacceptable. The water system should make sure the doors and windows are locked or otherwise secured. There may be other acceptable ways to secure the booster pump house. For example, a perimeter fence with a locking gate may replace the need to lock the booster pump house.
How to mark the checklist	Mark "Yes" if you believe the booster pump house is adequately protected from unauthorized entry.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-415 (6) WAC 246-290-415 (9)
Publications	*Responding To A Threat Against A Water System* 331-183 (PDF) *Water System Security and Emergency Response Planning* 331-199 (PDF)
Webpage(s)	Emergency Response and Security
Standard language	**If the issue is simply ensuring booster pump house entries are locked.** You must secure the well house against unauthorized entry. Install locks and lock all entries to the well house, including windows. **If the issue of booster pump house security is more complex.** The interior of the well house is vulnerable to vandalism and unauthorized entry due to _____. You must submit a corrective action plan to DOH describing how you will secure the booster pump house against unauthorized entry.
Other notes for the sanitary surveyor	If a purveyor says a lock isn't going to stop a dedicated person from gaining access into the booster pump house, explain that a secured booster pump house is a barrier. Damage to the lock will alert them to potential contamination or vandalism, so they can address it in a timely manner. Securing the booster pump house against unauthorized entry is a standard industry practice, no matter how small or remote the water system. You may need to change the wording above to describe the system's specific situation.

Item 63	Is the booster pump house properly constructed and maintained?
Guidance	The booster pump house should be: • Built of durable materials. • Weatherproof. • Heated, if in a freezing climate. • Free of obvious electrical or mechanical hazards. • Free of clutter and readily accessible. • Ventilated, clean and dry. It is safe to enter most booster pump houses. However, if you consider a booster pump house structure unstable or in such disrepair that entry is unsafe, DO NOT ENTER the structure. If the booster pump is in an underground vault, DO NOT ENTER (because an underground vault is a confined space). You may request photos of any parts you cannot see from outside. You may ask the operator to take photos during or after the survey.
How to mark the checklist	Mark "Yes" if the booster pump house meets all the standards listed above. Mark "No" if the booster pump house fails to meet any of the standards listed above.
Classification	Recommendation if marked "No." Identify this as a significant finding if the location of the booster pump house is unsafe to enter. DO NOT ENTER the structure. Identify and describe the problem in the comment section of Part G, noting the classification as a significant finding. Photograph the condition of the structure without entering it.
WAC reference	WAC 246-290-415(1) & (4) & (9) WAC 246-290-135(2)(a)
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	**Recommendation.** We recommend that you make the following improvements to the booster pump house: (Then list the specific improvements you believe the purveyor should make.) **Significant Finding (because it's structurally unsound and unsafe to enter).** The booster pump house is unsafe to enter. Submit a plan to repair or replace the booster pump house so that it is structurally sound, weatherproof, clean, dry, heated, and free of hazards. **Significant Finding (because it's a confined space).** The surveyor could not enter the booster pump house because it is a confined space. Please submit photographs of the [list components you could not see from outside the pump house] within the booster pump station.
Other notes for the sanitary surveyor	Record observations if there is a risk of freezing (no reliable heat source; insufficient insulation); leaking roof; leaking pipes; standing water; obvious physical or electrical hazards (confined space, unsafe wiring); or severe corrosion. If the condition of the booster pump house compromises security, and leaves the structure vulnerable to unauthorized entry, address this in Item 62. Poor ventilation, leaking roofs, or vapors from chlorine disinfection equipment may cause extreme corrosion of pipes, valves, pressure tanks, and controls. The purveyor should practice proper maintenance to protect the booster pump facilities against corrosion.

Checklist Part H: Pressure Tanks

Water systems install pressure tanks to allow the source pump to shut down when water demand drops below the level at which the well pump was designed to operate. Pressure tanks release a supply of water to the system while the well pump is off. When properly sized, pressure tanks release the right amount of water between pump cycles to prevent cycling on/off too frequently and protect the pump from premature failure.

If a water system has a single-speed well pump, there is a particular operating range most suitable for that pump. If it pumps at a rate below that operating range, it causes excessive pressure and premature pump failure.

A variable speed drive (also called variable frequency) on the pump motor can operate at a very low pumping rate without over-pressurizing the water system. A variable speed drive on the pump motor dramatically reduces the size and number of pressure tanks needed to maintain pressure during extremely low flow periods.

Topics to Describe in the Comments Section of Part H

- Describe and evaluate the pressure tanks.
- Maintenance and operations.
- Sanitary and security observations.

Item 64	Are there any pressure tanks in use?
Guidance	Include hydropneumatic and bladder pressure tanks.
How to mark the checklist	Mark "Yes" if there are any bladder tanks or hydropneumatic tanks in active service.
Classification	Informational
WAC reference	
Publications	*Hydropneumatic Tank Control Systems* 331-380 (PDF) *Pressure Relief Valves on Pressure Tanks* 331-429 (PDF) *Troubleshooting Bladder Pressure Tanks* 331-342 (PDF)
Webpage(s)	
Standard language	None.
Other notes for the sanitary surveyor	

Item 65	For systems using an air compressor, is the compressor an oil-free type or does it use food-grade oil?
Guidance	If the compressor uses nonfood-grade oil as an engine lubricant, some of that oil can leak around the O-ring into the air supply going into the tank (and will leak in older or poorly constructed or maintained compressors). Over time, oil can build up on top of the water in the tank, contaminating the supply.
How to mark the checklist	Mark "Yes" if the compressor is an oil-free type, or the engine lubricant for the compressor is food-grade oil. Mark "No" if the compressor is oil-lubricated **and** the oil lubricant is not food-grade. Mark "N/A" if there is no compressor.
Classification	Significant finding if marked "No."
WAC reference	WAC 246-290-220 WAC 246-290-415 (6)
Publications	*Hydropneumatic Tank Control Systems* 331-380 (PDF)
Webpage(s)	
Standard language	The existing compressor uses non-food grade oil as a lubricant. Replace it with a compressor that uses food-grade oil for lubrication, or an oil-free compressor. Compressed air produced by the unit may carry oil into the drinking water supply. We recommend you inspect the inside of the pressure tank and remove any residual oil.
Other notes for the sanitary surveyor	Almost all hydropneumatic tanks require an air compressor and compressor controls to maintain the proper range of air and water in the tank. A hydropneumatic tank successfully operates in a range of about 40 to 60 percent air. Too much air or too much water will decrease the effectiveness of the tank, and result in excessive on/off cycling of the pumps connected to the tank.

Item 66	Are valves present to isolate pressure tanks for maintenance or repair?
Guidance	Hydropneumatic tanks require periodic cleaning, repair, re-coating, and so forth. Bladder tanks require periodic replacement. An isolation valve will enable the operator to work on one of these tanks while maintaining water service.
How to mark the checklist	Mark "Yes" if there are shut-off valves in position to isolate each pressure tank, or at least a portion of the pressure tanks in service. The intention is to identify whether the capacity exists to repair or replace a pressure tank without having to shut down the water system.
Classification	Recommendation if marked "No."
WAC reference	
Publications	*Pressure Relief Valves on Pressure Tanks* 331-429 (PDF)
Webpage(s)	
Standard language	We recommend installing isolation valves on each pressure tank during the next scheduled shutdown of the water system. These valves will enable you to repair or replace each tank without needing to shut down the water system and interrupt water service.
Other notes for the sanitary surveyor	

Item 67	**Is there an ASME pressure relief valve installed between each pressure tank and any shutoff valve?**
Guidance	There are significant safety and reliability hazards associated with the sudden and catastrophic failure of a pressure tank. An appropriately sized and located ASME pressure relief valve (PRV) must be installed at all pressure tanks, including bladder tanks and hydropneumatic tanks. The capacity of the PRV must be sufficient to handle the pumps full rate of flow at pressure-vessel design limit.
How to mark the checklist	Mark "No" if ASME pressure relief valves are not in place as shown in *Pressure Relief Valves on Pressure Tanks* 331-429 (PDF).
Classification	Observation if marked "No."
WAC reference	WAC 246-290-200 WAC 246-290-415 (5)
Publications	*Pressure Relief Valves on Pressure Tanks* 331-429 (PDF)
Webpage(s)	
Standard language	WAC 246-290-200 requires the application of good engineering criteria in the construction of public water systems. The state Department of Labor and Industries (L&I) and ODW agree that an adequately sized ASME Section VIII pressure relief valve (PRV) must be installed in the water piping adjacent to each pressure tank. When installing a PRV, be sure there is no isolation valve between the PRV and the pressure tank.
Other notes for the sanitary surveyor	"ASME" stands for American Society of Mechanical Engineers. Bladder tanks greater than 37.5 gallons in (gross) size must be constructed to ASME standards (RCW 70.79). Very few of the pressure tanks installed in service to public drinking water systems meet this standard for construction. L&I and DOH have a **general agreement** on the use of non-ASME bladder tanks (until legislation is changed). L&I supports DOH's practice of approving non-ASME bladder tanks for public water system use as shown in *Pressure Relief Valves on Pressure Tanks* 331-429 (PDF). because: • The ODW standard does not represent an unsafe environment or promote an unsafe practice. • The ODW standard avoids creating an undue economic hardship and economic distress among the regulated community. **Identifying an ASME pressure relief valve.** All pressure relief valves built according to ASME Section VIII must have specific information on a nameplate attached to the valve. • The manufacturer's name. • The rated flow capacity at an overpressure of 10 percent or 3 psi of the set pressure. • The valve model number, set pressure, and inlet size. You can identify a pressure relief valve certified to ASME Section VIII by locating a "UV" stamped on the nameplate.

Item 68	Are the pressure tanks in good working condition?
Guidance	For hydropneumatic tanks, identify: 1. Leaks. 2. Excessive rust. 3. Inaccessible, inoperable, or nonexistent access hatches. 4. Inoperable air-water level control systems. 5. Inappropriate operating air-water level (condensation or a visual level gauge may provide clues to the air-water interface level and whether the tank is water-logged). For bladder tanks, identify: 1. Leaks. 2. Dents. 3. Excessive rust.
How to mark the checklist	Mark "Yes" if you believe all the pressure tanks are in good working condition. Mark "No" if you discover significant defects in the construction, maintenance, or condition of a pressure tank that present a high risk of pressure tank failure. If you mark "No," describe your findings in the comment section of Part H.
Classification	Recommendation if marked "No."
WAC reference	
Publications	*Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	We recommend you [state the solution] your pressure tanks to maintain safe and reliable operations.
Other notes for the sanitary surveyor	If the condition of one or more pressure tanks poses a systemic risk to the pumping system's ability to maintain pressure in the distribution system reliably, refer to Item 33 (for pressure tanks at a source) and Item 61 (for pressure tanks at a booster pump station). If you marked Item 33 or Item 61 "No," document the degraded condition of the pressure tank as a Significant Deficiency under those items, not Item 68. If any pressure tank serving this system is so badly degraded that you think it poses a life safety hazard, consult with the regional office.

Checklist Part I: Finished Water Storage

The surface of the water inside a finished water storage tank is under atmospheric pressure, like the surface of the water in a bucket. Most water systems have a finished water storage tank to:

- Supplement what the wells deliver, to meet peak consumer demand.
- Store water for use during source failure.
- Store water for use when fighting a fire.
- Allow the source pumps to shut down.
- Provide contact time in support of a treatment objective. (It increases "T" in the C x T equation for groundwater disinfection before the first connection.)

Finished water storage installations may require pumping water out of the tank or may allow water to flow by gravity from the tank into the distribution system. Tanks designed to pump water to the distribution system are usually near the well and modest in height. Some may be partially or completely buried.

Tanks designed to allow water to flow by gravity must be built so that the low operating level of the tank is at least 70 feet above the highest customer, to provide the minimum required service pressure (30 psi during peak demand).

Second only to sources, storage tanks are the most scrutinized component of a small water system. The survey checklist reflects this by the number of questions that represent significant deficiencies and significant findings. The reason for this is simple: storage tanks (like the water in a well) operate under atmospheric pressure. It's much easier for a contaminant to enter a storage tank than a pressurized element of the water system.

Topics to Describe in the Comments Section of Part I

- Describe and evaluate the finished water storage facilities.
- Volume.
- Operational drawdown.
- Configuration of the inlet and outlet piping.
- Concerns about operations and maintenance.
- Sanitary and security observations.
- Construction material (steel, concrete, wood, plastic).

We use the terms "ground-level tank" and "elevated tank" in Part I. A ground-level tank is generally considered a water storage tank where the stored water chamber is in contact with the tank's foundation; it is not a standpipe. Plastic tanks, concrete tanks, and many steel tanks, are ground-level tanks. An elevated tank is generally considered a tall stand pipe or a water storage tank where the stored water chamber is not in contact with the ground (for example, a tank on legs).

Ground Level Tanks

Elevated Tanks

Item 69	Is there a finished water storage tank in use?
Guidance	Include all water storage tanks containing potable water, even those that are small and exist as part of the source of supply (a wet well).
How to mark the checklist	Mark “Yes” if there is a storage tank operating with finished potable water.
Classification	Informational.
WAC reference	WAC 246-290-010 Definitions.
Publications	
Webpage(s)	
Standard language	None.
Other notes for the sanitary surveyor	Pressure tanks are not finished water storage tanks. The water surface inside a finished water storage tank is under atmospheric pressure. A finished water storage facility is a water storage structure integrated with a water system's distribution network to provide for variable system demands. These include, but aren’t limited to, daily equalizing storage, standby storage, fire reserves, or providing for disinfectant contact time. A purveyor may convert an old hydropneumatic pressure tank into a finished water storage tank. You can tell this by checking for installed venting. Pressure tanks don’t have vents to the atmosphere, but water storage tanks do. Apply the same survey standards to plastic tanks as to other types of tanks when inspecting the sanitary integrity of the hatch, vent, overflow, and any other reservoir openings.

Item 70	**If unable to physically inspect the reservoir hatch, vent, roof, or overflow outlet, select the method you discussed with the purveyor to document their condition:** **a. Reviewed and discussed maintenance records and recent photos.** **b. The purveyor will take and mail photos. Additional DOH follow-up required.** **c. Purveyor unable or unwilling to document. Additional DOH follow-up required.**
Guidance	See Section 3.1.1. If the purveyor provides recent photos of the reservoir roof and its appurtenances, you should take them as part of the survey record. If the purveyor can't provide recent photos of the reservoir roof and its appurtenances, you should determine whether (b) or (c) above applies and mark the checklist accordingly.
How to mark the checklist	Check the one box that best describes the circumstance (70a, 70b, or 70c).
Classification	Significant finding if the surveyor checks Box **70b** or **70c**. If you check "unk" in Item 71, 72, 73, 75, 76, 79, or 80, you should also check Box 70b or 70c .
WAC reference	WAC 246-290-416 Sanitary Surveys. WAC 246-290-415 Operations and Maintenance.
Publications	*For Community Systems: Small Water System Management Program Guide* 331-134 (PDF) *Non-Community Small Water System Management Program Guide* 331-474 (PDF) *Preventive Maintenance Program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	Submit photos (less than 12 months old) of the reservoir hatch, vent and overflow outlet. The photos must show enough detail to determine whether these features protect the storage tank against entry of contaminants. At a minimum, provide photos of the: • Hatch in the open and closed position showing the gasket and the lock. • Vent showing the overall vent structure and the screen material. • Overflow discharge. • Any other tank penetrations on the top of the reservoir.
Other notes for the sanitary surveyor	As part of a written Operations and Maintenance Program, the operator should routinely inspect the interior and exterior of storage tanks (including the tops), hatches and seal gaskets, vents and screens, overflows, and water quality. The operator should maintain records of routine and emergency maintenance, self-inspections and other operational activities. Ask the operator how often he or she inspects the reservoir roof.

Item 71	Is the storage tank protected from unauthorized entry or vandalism?
Guidance	The purveyor must secure each storage tank to deter unauthorized entry. The most common approach to securing a storage tank includes a perimeter 6-foot chain-link fence with three strands of barbwire atop the fence, a locked fence gate combined with a locked gate at the base of the access ladder cage, and a lock on the reservoir roof hatch. When you evaluate reservoir security, consider the location, visibility, and size of the tank. A perimeter fence is not a requirement for securing the storage tank against unauthorized entry. However, you should require some kind of locking mechanism on each roof-access hatch. The hatch should be made of strong, durable material.
How to mark the checklist	Mark "Yes" if you believe the storage tank is protected adequately from unauthorized entry.
Classification	Significant finding if marked "No." If unknown, mark "unk" and refer to Item 70.
WAC reference	WAC 246-290-235 WAC 246-290-415 (6) WAC 246-290-415 (9)
Publications	*Responding To A Threat Against A Water System* 331-183 (PDF) *Water System Security and Emergency Response Planning* 331-199 (PDF)
Webpage(s)	Emergency Response and Security
Standard language	**If the issue is simply ensuring the roof hatch is locked.** Secure the storage tank access hatch against unauthorized entry. Install a lock and keep it locked at all times. **If the issue of reservoir security is more complex.** The storage tank is vulnerable to vandalism and unauthorized entry due to _____. Submit your corrective action plan to secure the storage tank against unauthorized entry to us.
Other notes for the sanitary surveyor	Some storage tanks are in remote locations, with little or no regular surveillance by law enforcement, water system staff or even concerned customers. Thus, some storage tanks are easy targets for vandalism and sabotage. Some phone companies use storage tanks as a base to install telecommunications equipment. That usually means the phone company has keys to access to the top of the storage tank. Giving keys to non-utility personnel increases the risk that unauthorized people can achieve undeterred access. Each storage tank must be built and maintained to deter unauthorized entry to the reservoir and prevent vandalism (intentional damage to contamination barriers or inserting material into the storage tank). We expect purveyors to lock each storage tank hatch or bolt it in place with bolts that require a special tool to remove, unless the tank is located inside a locked building (e.g., plastic tank). Purveyors should secure access to the top of the reservoir, so that only authorized persons may climb the tank. Mark this or any storage tank checklist item "unk" if the tank component can't be found or the operator didn't provide the recent photographs you need to answer the question confidently. If the tank is plastic and installed outside a building, assess the tank in light of all physical security risks including vandalism, damage from tree fall, freezing, and UV exposure. If installed inside a locked building, the reservoir hatch itself does not need to be lockable.

Item 72	Is the reservoir roof free of any unprotected openings?
Guidance	You should make sure there are no holes in the reservoir roof that could allow contaminants to enter the finished water tank. This item is for conditions not addressed by Item 73 (reservoir hatch) or Item 75 (reservoir vent).
How to mark the checklist	Mark "Yes" if the design, construction and condition of the roof provide no openings or other ways for contaminants, such as rainwater runoff, animals or birds, or waste from animals or birds (droppings) to enter the drinking water supply. You should note even a small hole.
Classification	Significant deficiency if marked "No." If unknown, mark "unk" and refer to Item 70.
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	The [describe the condition that must be corrected] must be sealed to keep contaminants out of the public drinking water supply.
Other notes for the sanitary surveyor	Openings may include the holes made in the reservoir roof to pass electrical wires, level indicator cables, or abandoned structural elements. Cracks and gaps in concrete (most likely present in a "cold joint" in the concrete reservoir) are also entry points that may be located between the roof and the top of the sidewall of the reservoir.

Item 73	Is the access hatch constructed and sealed to keep contaminants out?
Guidance	The access hatch must be weatherproof. It should prevent any amount of rainfall, snowmelt, and so on from entering the reservoir. The publication referenced below shows the ideal access hatch cover.
How to mark the checklist	Mark "Yes" if the design, construction and condition of the hatch provide no openings or other means for contaminants to enter the drinking water supply (such as rainwater runoff, animals, birds, or waste from animals or birds. You should note even a small hole in the hatch assembly or cover, a misaligned or missing seal or hatch gasket, or ill-fitting framing.
Classification	Significant deficiency if marked "No." If unknown, mark "unk" and refer to Item 70.
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (6)
Publications	*Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF)
Webpage(s)	
Standard language	**The surveyor may elaborate on specific measures the system should take. Use one or more of the following statements:** **If the issue is a missing or damaged gasket:** Repair or replace the access hatch gasket to keep out contaminants. See *Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF). **If the hatch is ineffective due to poor design, poor construction, or deterioration:** Repair or replace the access hatch to keep contaminants out. See *Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF).
Other notes for the sanitary surveyor	There are many types of access hatches. Ideally, the sides overlap a raised curb and the hatch closes against a gasket for a tight seal. See *Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF). All hatches, including the screw-in type common on plastic tanks, must keep contaminants out during normal operation and while opening and closing the tank hatch. The purveyor must keep the hatch locked (Item 71) unless the tank is inside a locked building. A manhole cover used as a reservoir hatch is a significant deficiency unless the manhole cover is waterproof **and** an operator can clean the top of the cover before "flipping it" up and away from the opening. Waterproof manhole covers are rare. Some cylindrical steel storage tanks have bolted-flanged hatches with a rubber gasket seal. These may be more difficult to inspect because operators hesitate to unbolt them for fear of damaging the gasket material. This fear may prevent the operator from opening them for routine inspection or maintenance. This is a great training opportunity. Encourage the operator to inspect the gasket seal routinely and replace it as needed. If appropriate, make this a recommendation in your survey report. "Gutter" style hatches (by Bilco) are built on a raised concrete curb with an internal gutter beneath the cover. The cover is not waterproof and the gutter drains to an external outlet. There must be a noncorrodible screen over the drain outlet to keep animals out of the internal gutter. The operator should clean the gutter on a regular basis. These types of hatches must be well constructed and maintained to minimize the risk of contamination. Custom-made retrofit access hatches are available from vendors and fabricators including the Mt Baker Silo company. If the tank is inside a building, identify instances where headspace is insufficient to open the hatch and safely enter the tank.

Item 74	If able to open the hatch, is the stored water free of visible contaminants?
Guidance	**If you see any animal inside the reservoir (alive or dead); or you observe proof that an animal has access into the reservoir interior (droppings, nests, and so on) call our regional office as soon as possible. Instruct the purveyor to issue a boil water advisory immediately. Verbally give the purveyor the instructions in "standard language" below.** Ask the operator about the risk to water quality and effort involved in opening the hatch. You should not open the hatch, even with the operator's approval. The operator should do it. The interior of a reservoir is a confined space and you should not enter. From above the top of the hatch, visually inspect the inside of the reservoir for: • Insects, dead birds, reptiles, or other small animals. • Evidence of live birds, bats, and small mammals nesting inside the reservoir. • Cloudiness in the water column's appearance. • Sheen or scum layer on top of the water. • Damage to internal components, such as a broken mercury level switch at the bottom of the reservoir. • Roots that penetrate through the reservoir walls or floor. If possible, photograph the items you see inside the reservoir. Record your observations in the comment section of Part I.
How to mark the checklist	Mark "Yes" if the stored water appears free of visible contaminants. Mark "unk" the operator didn't open the hatch for your visual inspection.
Classification	**Significant deficiency** if you see any animal inside the reservoir (alive or dead); or you observe proof that an animal has access into the reservoir interior (droppings, nests, and so on).
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Complete the storage tank inspection and report the results to us. Repair or replace any defect that may allow animals to enter. **If you see any animal inside the reservoir (alive or dead), or you see proof that an animal has access into the reservoir interior (droppings, nests, and so on), add the following.** Isolate the reservoir from the distribution system, drain the reservoir, remove all contaminants, refill and disinfect the reservoir with 10 mg/l of free chlorine for 24 hours, drain the reservoir at the end of the 24-hour disinfection period, and then contact your ODW regional office.
Other notes for the sanitary surveyor	Wood stave reservoirs and reservoirs constructed with a concrete foundation and a wood-truss roof are particularly vulnerable to contaminants. You should carefully scrutinize these reservoirs during your inspection. Do not allow a "clean" coliform sampling record to deter a thorough inspection of the interior, exterior and sill space (between concrete and wood). Poor initial construction, weather, wood rot (there is a lot of condensation inside these reservoirs), birds (woodpeckers), bats, rodents, and destructive insects all contribute to the risk of a contaminant pathway into the reservoir. Stored water with elevated iron or manganese is at higher risk of iron or manganese bacteria, which create a crust or sheen on the surface.

Item 75 and 75a	**Is there a dedicated air vent on the storage tank?** **If yes, was the air vent constructed to prevent the entry of contaminants?**
Guidance	Air vents maintain atmospheric pressure within the storage tank during tank filling and tank draw. Do not accept a purveyor's argument that an overflow pipe is an adequate substitute for a dedicated air vent. Reservoirs must have a dedicated air vent.
How to mark the checklist	Mark "Yes" if the design, construction and condition of the vent provide no openings or other means for contaminants to enter the drinking water supply. See guidance below.
Classification	Observation if **Item 75** marked "No." If unknown, mark "unk" and refer to Item 70. Significant deficiency if **Item 75a** marked "No." If unknown, mark "unk" and refer to Item 70.
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (6)
Publications	*Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF) *Sanitary Protection of Reservoirs: Vents* 331-250 (PDF)
Webpage(s)	
Standard language	**If Item 75 is marked "No":** Finished water storage facilities must have a screened atmospheric vent (WAC 246-290-235). Consult with us on how to provide proper venting for your storage tank. **If Item 75a is marked "No."** Modify the storage tank vent to keep contaminants out of the public drinking water supply. (Insert appropriate bullet from list below). See the appropriate standards for finished water storage tank vents in *Sanitary Protection of Reservoirs: Vents* 331-250 (PDF). If you are concerned these modifications might put the structural integrity of your reservoir at risk, consult with a licensed professional engineer on re-design of your reservoir vent. Refer to DOH's Water System Design Manual 331-123 (PDF) on reservoir vent design. • Install a 24-mesh noncorrodible screen on the reservoir vent backed by a four-mesh screen. For elevated tanks, you may use a four-mesh noncorrodible screen. • Replace the screen on the reservoir vent with a 24-mesh noncorrodible screen backed by a four-mesh screen. For elevated tanks, you may use a four-mesh noncorrodible screen. • Replace the upward-facing vent with a vent that has a downward facing opening. • Replace the ventilator-type vent with a vent that has a downward facing opening. • Reconfigure the reservoir vent to prevent animals or insects from nesting on the screen.
Other notes for the sanitary surveyor	You may elaborate on specific measures the purveyor should take to modify the air vent. Contaminants can enter the reservoir through the venting several ways. For example, mesh larger than 24-mesh size on the screens may be too large to exclude insects. The vent design and location may allow airborne, dust-borne, rain-borne, and splatter-driven contaminants into the tank. The seal between the vent and the top of the reservoir may be inadequate, allowing surface runoff to seep or flow into the tank. Vents with openings not elevated far enough above the reservoir top can draw in contaminants (design standards require a 1- to 2-foot vertical elevation). Horizontal vent openings with screens that face upward provide a perfect setting for animals to nest. Even with a screen over the opening, contaminants can flow through the screen into the tank. The purveyor must reconstruct vents that have upward-facing horizontal openings. Damaged and beat-up vents, turbine-type spinning vents, and vents missing screens must be restored or replaced with a type of vent that provides better sanitary protection, security and durability. Higher quality vents protect against icing, frost build up, tampering, and negative and positive air pressures. Semi-buried concrete tanks may have small vent openings in the vertical wall, which need shields to direct the opening downward. An air vent added to an existing plastic tank hatch must be installed as shown in *Sanitary Protection of Reservoirs: Hatches* 331-249 (PDF).

Item 76	Is the overflow line constructed to prevent contaminants from entering the tank?
Guidance	Each storage tank should have an overflow. If the system that controls water-flow into the reservoir fails, the overflow provides a deliberate, safe passage for excess water to leave the tank before excess water pressure threatens the structure. Because there is a direct pathway from the overflow outfall into the tank, the outfall must have a barrier to keep small animals and birds out of the overflow pipe. There is no concern with a tank overflow-line and drain-line sharing a common outfall if the discharge is protected to prevent contaminants from entering the tank. You should visually inspect the outfall of every storage tank overflow. Past discharge through the outfall may have damaged or loosened the screen, flapper valve, or other device used to prevent animals from entering the reservoir through the overflow line. The overflow discharge should be visible and located so that discharge drains freely away from the overflow outlet. The overflow outlet should not be buried.
How to mark the checklist	Mark "Yes" if the design, construction, and condition of the overflow provide no openings or other ways for contaminants to enter the drinking water supply.
Classification	Significant deficiency if marked "No." If unknown, mark "unk" and refer to Item 70. Observation if there is no constructed, dedicated reservoir overflow piping system.
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	**Significant Deficiency.** Secure a four-mesh noncorrodible screen over the end of the overflow line or cover it with a flapper valve to keep birds, rodents, and other small animals out. You can install insect screen on the inside of the 4-mesh screen for added protection. **Observation.** Finished water storage facilities must have an overflow pipe (WAC 246-290-235). Without an overflow, if the reservoir overfills it could cause structural damage to the storage tank, the hatch, or the atmospheric vent. Contact DOH for guidance on the proper way to protect your storage tank from overfilling.
Other notes for the sanitary surveyor	You may elaborate on specific measures the owner or operator should take to modify the overflow outfall. For reservoirs with the roof at or near ground level, surveyors should make sure: • The overflow cannot actually drain overflow waste (or other water that contacts the surrounding environment) back into the reservoir. • Flap or flexible check valve (duckbill) valves at the overflow outfall close tightly. Overflow discharge outlets should have visible screens, flexible check valves, or flapper valves. The installation of a flapper valve or flexible check valve should allow the valve to close fully. Mice can enter a space that's less than ½-inch in size.

Item 77	Does the overflow line discharge near ground level?
Guidance	The overflow should discharge within 24 inches of the ground surface. This makes the overflow visible to the operator while providing for controlled "splash" and energy dissipation (to avoid erosion).
How to mark the checklist	Mark "Yes" if the overflow line discharges near the ground.
Classification	Recommendation if marked "No."
WAC reference	
Publications	
Webpage(s)	
Standard language	We recommend that the overflow discharge about 24 inches above grade onto a splash plate or other structure to prevent erosion and damage of property.
Other notes for the sanitary surveyor	Record any highly unusual feature of the overflow in the comment section of Part I, and take photographs. Reservoir overflow lines should discharge in a location where the operator can inspect the outlet on a routine basis.

Item 78	Is the overflow line discharge-area protected from potential erosion?
Guidance	Prolonged overflow discharge (imagine failure of the pump control system) could create erosion in all but the most reinforced soils. We are particularly concerned with the potential to erode any part of the reservoir foundation or other critical water system structure.
How to mark the checklist	Mark "No" if you believe a prolonged overflow event will likely cause erosion that threatens water system infrastructure or private property.
Classification	Recommendation if marked "No." Significant Finding if the potential for erosion due to a prolonged overflow event threatens the reservoir foundation.
WAC reference	WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	**Recommendation.** We recommend you construct an energy dissipation structure and a defined course for water to flow or accumulate to prevent erosion and damage to property. Corrective actions may include installing riprap, a drainage course for water flow, and/or a retention pond. **Significant Finding.** Submit a corrective action plan that describes how you will protect the reservoir from damage caused by an extended overflow event. Corrective actions may include reconfiguring the overflow discharge location or installing riprap, a drainage course for water flow, and/or a retention pond.
Other notes for the sanitary surveyor	To determine the difference between a recommendation and a Significant Finding, look for signs of erosion from previous overflow events that indicate eventual structural damage to the reservoir is likely. If you decide it's a Significant Finding, take photographs of the erosion and document your findings under comments in Part I. We need clear evidence from you to move forward with enforcement on this finding.

Item 79 and 79a	**Does the overflow line discharge into a storm drain or surface water? If yes, is there an air gap at the overflow discharge OR does the overflow drop at least 34 vertical feet measured from the overflow connection down to the receiving water body?**
Guidance	The overflow should be constructed so that an operator can see that an overflow is occurring and take steps to stop it. There should be an air gap between the overflow pipe outlet and the receiving structure or water body. To protect the water in the reservoir from contamination, direct insertion of the end of an overflow pipe into a nonpotable substance constitutes a potential cross-connection hazard. It's important to establish the 34-foot vertical difference. If there are at least 34 vertical feet between the upper-most reach of the overflow pipe (usually the overflow pipe inlet) and the maximum water level in the overflow receiving structure, it's impossible to back-siphon anything into the drinking water supply.
How to mark the checklist	If the answer to **Item 79** is "No," skip **Item 79a**. Mark **Item 79a** "Yes" if there is a two-pipe diameter air gap between the end of the overflow pipe and the top of the catch basin, OR the overflow discharges to a drainage swale constructed in a way that will not submerge the end of the overflow pipe into the water in the swale. OR Mark **Item 79a** "Yes" if you believe the difference in height between the overflow connection at the tank and the maximum water level in the overflow receiving structure or water body is at least 34 feet. If unknown, mark **Item 79** "unk" and refer to Item 70.
Classification	Significant deficiency if **Item 79** is marked "Yes" and **Item 79a** is marked "No."
WAC reference	WAC 246-290-235 WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Create a minimum two-pipe diameter air gap between the end of the overflow pipe and the high water level of the receiving structure or water body.
Other notes for the sanitary surveyor	Most reservoirs have vents that should keep negative internal pressure from developing when demand draws water out of the reservoir. However, if the vent clogs it is possible to develop pressure below atmospheric inside the reservoir while the water system draws water from the reservoir (this is an extremely rare event). Surveyors may observe the overflow discharging below the top of a catch basin or manhole located near the base of the tank. This may be the beginning of a dedicated drainage system for the overflow, and not part of the municipal storm drainage system. Ask the operator where the pipe leaving the catch basin or manhole goes. If the overflow discharges into a dedicated drain, then the risk of blockage in the drain is very low. If there is at least a 34-foot vertical difference between the overflow connection to the tank and the maximum water level in the system of catch basins and drainpipes comprising the overflow receiving structure, then it's impossible to back-siphon anything into the drinking water supply.

Item 80	Does the overflow line discharge directly into a sanitary sewer?
Guidance	You should determine whether the end of the overflow connects directly to a sanitary sewer (this would be extremely unusual).
How to mark the checklist	Mark "Yes" if the overflow discharges **directly** to a sanitary sewer or into a sanitary sewer manhole.
Classification	Significant deficiency if marked "Yes." If unknown, mark **Item 80** "unk" and refer to Item 70.
WAC reference	WAC 246-290-235 WAC 246-290-415 (6)
Publications	
Webpage(s)	
Standard language	Create an air gap of at least two pipe diameters between the end of the overflow pipe and the sanitary sewer.
Other notes for the sanitary surveyor	A direct connection from the end of the overflow pipe to a sanitary sewer may create a chimney effect, which pulls sewer gasses through the overflow into the reservoir and poses a cross-connection threat. A direct sewer connection is unacceptable, regardless of the vertical distance the overflow pipe drops. There is also a risk of backsiphonage similar to the cross-connection risk discussed in Item 79.

Item 81	Can the reservoir be isolated from the rest of the water system and be drained through a dedicated drain line?
Guidance	To drain a reservoir for maintenance and inspection, the operator must first close the valve that supplies water into the reservoir and then open the drain valve to let out the water. The drain may connect with the buried section of the overflow pipe If the drain has an outlet separate from the overflow, the valve controlling the drain remains closed while the tank is in operation. Therefore, a drain outlet (when separate from an overflow outlet) does not need protection to keep contaminants from entering the water supply.
How to mark the checklist	Mark "No" if the reservoir cannot be isolated from the distribution system, OR there isn't a way to drain the reservoir without introducing the contents of the reservoir into the distribution system. Note the missing provision (isolation or drain, or both) in the comment section of Part I.
Classification	Observation if marked "No."
WAC reference	WAC 246-290-235 (1) WAC 246-290-415 Operations and Maintenance
Publications	
Webpage(s)	
Standard language	**Missing or inoperable tank isolation valve(s).** Purveyors must have the capacity to isolate finished water storage facilities from the distribution system (WAC 246-290-235). During the next scheduled shutdown of the water system, install an isolation valve on the fill and withdrawal line(s) (or replace it, if the existing valve is inoperable). This will enable you to isolate the reservoir from the distribution system, so you can repair or maintain the tank without shutting down the water system and interrupting water service. **No means to drain the reservoir by gravity.** Purveyors must have the capacity to drain finished water storage facilities (WAC 246-290-235). During the next scheduled shutdown of the reservoir, install the means by which you can empty the reservoir without introducing the contents of the reservoir into the distribution system. This will facilitate your ability to respond quickly to a reservoir water quality or structural problem.
Other notes for the sanitary surveyor	If the reservoir is the only one serving a particular area, and the reservoir normally operates by gravity, then closing the reservoir isolation valve may cause a destructive vacuum to form in the pipeline on the distribution system-side of the reservoir isolation valve. There should be an air-vacuum relief valve located on the distribution system side of the reservoir isolation valve. It will allow air to enter the distribution system and relieve a vacuum formed when an unmet water demand is exerted on the distribution system. Many reservoirs have combined overflow and drain lines. This arrangement is allowed as long as it meets the requirements for both functions. Pumps may be used to empty a storage tank that has no gravity drain.

Item 82	When was the tank last inspected?
Guidance	This is not a question about when the operator last looked inside the reservoir. A qualified tank inspector or contractor should periodically inspect the structural integrity of all reservoirs.
How to mark the checklist	Mark this item with the date (year) when a qualified tank inspector or contractor last inspected the reservoir. If the operator doesn't know the exact year of the last inspection, ask for an approximate timeframe.
Classification	Recommendation if it's been more than five years since a qualified tank inspector or contractor inspected the interior of the storage tank.
WAC reference	
Publications	*Preventive Maintenance Program: Guide For Small Public Water Systems Using Groundwater* 331-351 (PDF) *Non-Community Small Water System Management Program Guide* 331-474 (PDF) *Small Water System Management Program Guide* 331-134 (PDF)
Webpage(s)	
Standard language	**If the interior of the storage tank hasn't been inspected in over five years:** We recommend hiring an experienced storage tank service and inspection contractor to perform an in-service cleaning and inspection of your storage tank.
Other notes for the sanitary surveyor	Operators or owners should get a comprehensive inspection of the interior whenever they drain the tank for cleaning. Industry standards recommend a comprehensive tank inspection—inside and out—every five years, except for newly constructed tanks. Purveyors should inspect a new tank within ten years of service and every five years thereafter. Services are available to clean and inspect reservoirs without draining the stored water. It is possible for several small water systems to schedule tank maintenance at the same general time potentially at lower cost. You should check the pre-survey data reports to see if there are elevated iron and manganese residuals in the source water that may build up sediments in the reservoir. Operators should know how frequently the rules require them to have the reservoir inspected.

Item 83	What is the tank cleaning frequency?
Guidance	This question refers to the purveyor's reservoir operations plan, which should describe how often the reservoir is cleaned. Inspections are probably on the same schedule. Specialized contractors routinely clean and inspect a reservoir while the tank is in service.
How to mark the checklist	Mark this item with the date (year) when a qualified tank cleaner or contractor last cleaned the tank. If the operator doesn't know the exact year of the last cleaning, ask for an approximate timeframe.
Classification	Recommendation if it's been more than five years since a qualified tank cleaner or contractor last cleaned the interior of the storage tank.
WAC reference	WAC 246-290-415 Operations and Maintenance
Publications	*Preventive Maintenance Program: Guide For Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	**If the interior of the storage tank hasn't been cleaned in over five years:** We recommend hiring an experienced storage tank service and inspection contractor to perform an in-service cleaning and inspection of your storage tank.
Other notes for the sanitary surveyor	For a list of qualified contractors who can clean and inspect a reservoir interior while the reservoir remains in service, query local information sources under terms such as "potable water tank cleaning services." Services are available to clean and inspect reservoirs without the need to drain the stored water. It is possible for several small water systems to schedule tank maintenance at the same general time potentially at lower cost. You should check the pre-survey data reports to see if there are elevated iron and manganese residuals in the source water that may build up sediments in the reservoir. Operators should know how frequently the rules require them to have the reservoir inspected. If the tank cleaning is covered under Item 74 or Item 82, do not add a similar recommendation under this item.

Item 84	Does tank size, operation, and internal piping configuration appear to provide adequate water turnover?
Guidance	The surveyor may not be able to answer to this question (that's okay). Good water turnover means the reservoir can mix existing stored water with new incoming water, based on its geometry, volume, operation (how much water is allowed to flow out of the reservoir before the reservoir is refilled), and the rate of flow in and out. Mixing is important because it prevents pockets of "old" water at risk of degraded quality.
How to mark the checklist	Mark "Yes" if the operator tells you there is a separate inlet and outlet, and the discharge end of the inlet pipe (flow into the reservoir) is located above the outlet pipe. Mark "No" if you determine the reservoir is large in proportion to the average daily demand of the water system and there is a single inlet-outlet pipe. A reservoir is large in proportion to demand if it holds more than 7 times the Average Daily Demand (ADD). The ADD can be determined from source meter readings. Otherwise, the surveyor should mark this item "unk" (unknown).
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-235(1)(b)
Publications	
Webpage(s)	
Standard language	We recommend you hire a licensed professional engineer to determine the best way to reduce the residence time and improve water turnover in your reservoir. Long residence time or poor mixing may degrade water quality, and lead to water quality problems in the distribution system and complaints from your customers.
Other notes for the sanitary surveyor	Maintaining free chlorine residual in the reservoir provides some protection against degraded water quality. Allowing the reservoir level to drop more before starting the supply pumps will "turn over" the reservoir more effectively. Expanding the range of the "pump-on, pump-off" level settings during periods of low demand (such as winter) also may discourage ice formation.

Item 85	**Does the tank show signs of excessive leakage, significant structural cracking, or advanced concrete spalling so that a structural assessment is needed?**
Guidance	We are particularly interested in reservoirs with flat roofs, or concrete reservoirs with concrete cold-joints between the sidewalls and roof. A cold-joint is when concrete is poured up against concrete that has already set up, such as between a wall and the roof of a reservoir. Cracks, spalling, and poor initial construction of the roof or sidewalls may provide pathways for contaminants to enter the drinking water supply and weaken the structure. Spalling is the loss of aggregate and, in severe cases, exposure of reinforcing steel. See "other notes" below for more information.
How to mark the checklist	Mark "Yes" if you believe cracks, spalling, or visible leaks pose a structural hazard, which could lead to a sanitary hazard (opportunities for contaminants to enter the reservoir) or progressive structural failure leading to the loss of use of the reservoir. Mark "No" for concrete reservoirs that weep very small amounts of water through sidewall construction joints (the reservoirs that look like large concrete silos commonly exhibit this).
Classification	Significant finding if marked "Yes."
WAC reference	WAC 246-290-235 WAC 246-290-415 (6)
Publications	*Preventive Maintenance Program: Guide For Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	Look for Leaks - Washington Water (wawater.com)
Standard language	Hire a qualified structural inspector to evaluate the reservoir. Submit a copy of the inspection results and a corrective action plan describing how you will address the inspector's findings.
Other notes for the sanitary surveyor	Concrete spalling is the progressive loss of concrete back to its constituent parts (aggregate stone and sand). Spalling may look like missing chunks from the tank sides or roof. It also may look like gravel poured on the tank roof. Spalling is caused by: • Poor initial formulation or curing of the concrete (too much water). • Freeze-thaw cycle fatigue. Each cycle creates micro-cracks that expand and remove the protective finish on the concrete surface. • Acidic pitting and weakening of the concrete surface due to rainfall. You should note cracks and leaks you can see or hear, and photograph, if possible. Wood stave tanks are at high risk for leaks.

Checklist Part J: Distribution System

The distribution system is made up of pipes, valves, blow-offs, hydrants, sampling stations, booster pump stations, and storage tanks.

However, our checklist focuses on the piping system and the components of the system that convey water from the source to the consumer. This network of pipes is buried in the ground, so it's not subject to physical damage, tampering, or freezing. Surveyors should not be surprised to learn that purveyors don't know exactly where some or all of this piping is, how old it is, or what it's made of.

For most communities, the distribution system is the most expensive infrastructure a purveyor owns. For most water systems, reconstructing the distribution system is more expensive than the cost to replace the storage tank, well, and well house. Since the cost to replace water mains is so high, financial planning and prioritization is critical if a purveyor intends to keep every customer reliably supplied with safe drinking water.

Low pressure, high distribution system leakage, discolored water and frequent water main breaks are signs that this expensive infrastructure has reached the end of its useful life, and realistic plans for its replacement must be developed and implemented.

Topics to Describe in the Comments Section of Part J

- Describe and evaluate the distribution system.
- Maintenance and operations.
- Sanitary and security observations.
- Distribution system air vacuum relief valves. Purveyors usually install these valves in underground vaults (due to freezing and security concerns). The valves vent air and relieve negative pressure within a distribution system. Small water systems usually don't have any of these valves, but ask about them anyway. If they do have some, take a picture of the vent (the vent should be above the vault) and the valve inside the vault.

Item 86	**Is a complete, up to date, and accurate map of the distribution system maintained?**
Guidance	An ideal map (and other supporting documents or records) displays the size and material of water mains; shows location of distribution system appurtenances such as main line valves, hydrants, blow-offs; the location, size, and capacity of reservoirs and booster pump stations; and the location and capacity of wells, interties, and other supply sources.
How to mark the checklist	Mark "Yes" if the purveyor maintains a current map of the distribution system showing the size and location of water mains, main line valves, blow-offs, and hydrants.
Classification	Observation if marked "No."
WAC reference	WAC 246-290-100 and -105
Publications	*Preventive maintenance program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF) *Small Water System Management Program Guide* 331-134 (PDF) *Noncommunity Small Water System Management Program Guide* 331-474 (PDF)
Webpage(s)	
Standard language	Purveyors must maintain a map of their facilities (WAC 246-290-105). The map should show the size and location of distribution system components, such as water mains, valves, hydrants, blow-offs; the location, size, and capacity of reservoirs and booster pump stations; and the location and capacity of wells, interties, and other sources of supply.
Other notes for the sanitary surveyor	A great map (and any other supporting documents or records) includes the above information plus the age of the pipeline segments, the maintenance history (date and location of major leaks repaired), and location information on service connections. If an operator claims that all this information is in his or her head, and it's not documented in writing and available to the governing board, that's a giant **RED FLAG**. You should document this fact in the comments section of Part J.

Item 87	Does the system provide adequate pressure throughout the distribution system?
Guidance	Adequate pressure is no less than 20 psi at each service connection during periods of peak demand, and positive pressure throughout the system during fire flow events. An at-risk setting is a development of homes built near the base of a reservoir without a booster station to provide adequate pressures.
How to mark the checklist	Mark "No" if the operator reports that sections of the distribution system operate with less than 20 psi during periods of peak demand.
Classification	If marked "No," this will be referred to the regional engineer for follow-up.
WAC reference	WAC 246-290-230 WAC 246-290-420
Publications	*Responding to a Pressure Loss Event* 331-338 (PDF) *Responding to a Backflow Event* 331-494 (PDF)
Webpage(s)	
Standard language	The low-pressure condition in a portion of your distribution system has been referred to DOH for further follow-up.
Other notes for the sanitary surveyor	If the operator admits there are connections served without a minimum of 20 psi during periods of peak demand, you should make a note of this in the comments section of Part J. Describe as much as you can about the location of the low pressures, the number of homes affected, how low the measured pressures are, and so on. Tell the operator this is a serious concern that you will refer to us. Also, note whether such connections operate with individual service line booster pumps, and if so, who owns and operates those booster pumps. Observe the placement of homes served by gravity from a nearby reservoir. If a home is less than 50 feet below the low operating level of the reservoir, the distribution system serves that home with less than 20 psi.

Item 88	Are proper procedures followed for disinfection of new construction or repairs?
Guidance	Improper or no disinfection practiced after new construction or repair poses a significant risk to consumers. We want you to determine whether the operator knows what he or she must do **before** restoring normal water service following work on the water distribution system.
How to mark the checklist	Mark "Yes" if the operator is aware of and follows industry standards for disinfecting the distribution system after repairs or new construction.
Classification	Observation if marked "No."
WAC reference	WAC 246-290-451 (1) and (2)
Publications	*Preventive Maintenance Program: Guide For Small Public Water Systems Using Groundwater* 331-351 (PDF) WASHDOT's 2010 Standard Specifications (PDF). *Water Main Break Response Protocol for Chlorinated Systems* 331-583 (PDF)
Webpage(s)	
Standard language	Operators must follow drinking water industry standards for disinfection after repairing existing water mains or installing new mains (WAC 246-290-451). Refer to Section 7.09 of the APWA/WASHDOT 2010 Standard Specifications (PDF).
Other notes for the sanitary surveyor	Operators should disinfect new and repaired pipelines according to established standards such as those from the Washington State Department of Transportation (WSDOT)/APWA Section 7.09 or AWWA C-651. Basic water main disinfection procedures follow a particular sequence: a. Prevent entry of contaminants during storage and construction. b. After installation, flush (3 fps). c. Chlorinate by dosing water flowing into new section of main at a rate of 50 ppm of free chlorine. At end of 24-hours, water in all section of new main should have at least 25 ppm of free chlorine (WSDOT/APWA Standard). d. Flush again until chlorine is completely gone. Dispose of chlorinated water in an environmentally safe manner. e. Protect against backflow during pressure test and disinfection. f. Collect coliform samples. g. Activate water main after coliform samples are reported satisfactory. To disinfect pipeline properly, the operator must have access to and competency in using a free chlorine field test kit.

Item 89	Are there any air relief or vacuum relief valves subject to submersion?
Guidance	Automatic air relief valves installed within the distribution system automatically vent air that may accumulate at high points in the pipe network. Vacuum relief valves installed within the distribution system automatically relieve a vacuum that could occur due to an unusual event (water main break, pump failure). By allowing air in the vacuum relief valve prevents vaporization of the water and damaging forces to the distribution system. The valves are usually installed in below-grade vaults and often within the road right of way.
How to mark the checklist	Mark "Yes" if you observe an air relief, vacuum relief, or combination air-vacuum relief valve connected to the distribution system and at risk of submersion.
Classification	Referral if marked "Yes."
WAC reference	
Publications	
Webpage(s)	
Standard language	Based on my observations, I have concerns about your below-grade air/vacuum valve installations. Air-vacuum and air relief valves installed in a below-grade vault may threaten water quality in the distribution system by backflow contamination of contaminated water that may accumulate in the vault. The valve installation should not provide a pathway for distribution system contamination by backsiphonage. I have referred this issue to ODW. ODW staff may contact you to inquire into the condition and operation of your air/vacuum valve vaults.
Other notes for the sanitary surveyor	If there are any air-vacuum relief valves installed in a vault along the distribution system, photograph the interior and exterior of a representative installation. Air-vacuum and air relief valves installed in a below-grade vault may threaten water quality in the distribution system by backflow contamination because of the intended operation of the valve. The valve installation should not provide a pathway for distribution system contamination such as by backsiphonage from an air-vacuum relief valve whose vent is located inside an undrained vault. The air inlet and discharge vents should be located outside the valve vault at least 18 inches above finished grade. Each vent (certain valves may have multiple vents) should have a screened downward-facing vent opening. Proper drainage away from the vent outlets is necessary. During valve operation, some water discharge will occur through the vent. If the internal valve does not seat properly, there will be continuous water discharge. If the design calls for any vent opening inside the vault, including a drilled weep hole on the vent riser and the vent pipe outlet, the installation should meet the following criteria. 1. The vault has a daylight drain that can be bore-sighted to a discharge point above grade and above the maximum flood level. The drain must be sized to discharge the flow of water that potentially could be discharged from the relief valve port. 2. Each vent opening is installed at least two vent pipe diameters above the crown of the vault daylight drain. 3. Groundwater is prevented from entering the vault. **In your survey notes, describe the feasibility of retrofitting the valve vault to meet the above criteria.** High points of distribution or transmission lines where air can accumulate should have a means of venting the air. We recommend using a *manual* air relief valve or other manual means of venting air (fire hydrant, flushing hydrant, some types of service connections) whenever possible in lieu of an automatic valve. Vacuum relief may be necessary at any point along a water pipeline where column separation is possible because of a sudden and significant increase or decrease in flow, such as sudden booster pump station or source pump failure, rapidly closing a valve, a large and sudden pipeline break.

Item 90	Does the purveyor seasonally or annually flush the distribution system?
Guidance	In most water systems, small particulate matter settles in the distribution system's "quiet" locations, such as dead ends. It's important to get this settled material out, or else it will someday affect water quality and consumer acceptance. Blow-off valves enable the operator to flush the distribution system. **Water main flushing is the process of cleaning or "scouring" the interior of water distribution mains by deliberately directing water through the mains to a discharge point (blow-off). Flushing helps to maintain water quality, is integral to the maintenance/repair of water mains (see Item 88), and helps an operator respond effectively to an emergency when it's important to get the existing water out of the distribution system as quickly as possible.**
How to mark the checklist	Mark "Yes" if the purveyor flushes the distribution system at least once a year at a velocity of at least 3 feet per second.
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-415
Publications	*Preventive maintenance program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	We recommend you flush your distribution system at least once a year. It's important to get settled material out of the pipes, or else it will someday affect water quality and consumer acceptance. If you have elevated iron and manganese or sediment problems, you may need to perform flushing more frequently. **Add the following statement if the purveyor cannot generate enough velocity in pipes to effectively flush.** We recommend you install facilities that permit flushing the distribution system by generating a scouring velocity of at least three feet per second. **Flushing helps maintain water quality, is integral to the maintenance/repair of water mains, and helps an operator respond to an emergency effectively when it's important to get the existing water out of the distribution system as quickly as possible.**
Other notes for the sanitary surveyor	Systems with elevated iron and manganese (Fe/Mn) need to flush routinely to reduce the sediment build-up that leads to discolored water and possible taste and odor problems. The pre-survey report includes source inorganic chemical test results that show Fe/Mn levels. Customer complaints may indicate a problem. **While flushing, the water should move in the distribution pipe at least three feet per second (fps). That means the blow-off at the end of a water main must have enough capacity to discharge the flow needed to create this velocity. A four-inch pipe flowing at 3 fps requires 120 gpm; a six-inch pipe requires 260 gpm.** **We do not recommend flushing through consumer service lines because what is flushed from the water main could get stuck somewhere in the consumer's plumbing. Moreover, a group of homes located at the end of a pipeline that open their hose spigots all at once can only effectively "flush" a water main of about two inches in size.** The challenge most small systems will have in periodically flushing is related to the infrastructure. • Are there blow-offs capable of discharging enough water to generate a flushing velocity in the water mains? • Are distribution system valves located so the operator can deliberately direct flushing through the water mains toward a designated discharge blow-off? Does the water system (wells, reservoirs, booster pump stations) have the capacity to generate sufficient flow to flush the water mains?

Item 91	Does the purveyor exercise its distribution system valves?
Guidance	Valves must be exercised periodically (opened and closed) or they won't work when they're needed. By simply cycling the valve position fully (from open to close to open, or vice versa), the operator will reduce the need for valve maintenance and repair, and greatly improve the chances that the valve will work on demand.
How to mark the checklist	Mark "Yes" if the purveyor exercises the mainline valves at least once a year.
Classification	Recommendation if marked "No."
WAC reference	WAC 246-290-415(4) Operations and Maintenance
Publications	*Preventive maintenance program: Guide for Small Public Water Systems Using Groundwater* 331-351 (PDF)
Webpage(s)	
Standard language	We recommend you exercise (turn fully closed then back to fully open) your distribution system valves at least once each year. Valves must be exercised periodically (opened and closed) or they won't work when they're needed. By simply cycling the valve position (from open to close to open again, or vice versa), you will reduce the frequency of valve maintenance and repair, and greatly improve the chances that the valve will work on demand.
Other notes for the sanitary surveyor	Valves are an important tool for the proper operation and maintenance of a distribution system, facilitating essential functions such as directional flushing, responding to contamination, and facilitating water main repair and replacement. The purveyor should include the cost to install new valves where needed, or to replace valves that no longer function, as part of the system's capital improvement and financial planning.

Checklist Part K: Cross-Connection Control

A **cross connection** is any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid, or gas that could contaminate the potable water supply by backflow. Cross connections exist in all plumbing systems. Cross connections may also exist in the purveyor’s water system facilities.

There are numerous well-documented cases where unprotected cross connections contaminated drinking water. These cases have caused illness, injury, and in some cases, death, to water system consumers.

The task of eliminating all cross connections is enormous. However, all purveyors can implement a cross-connection control (CCC) program that reasonably reduces the risk of contamination to their systems.

For a cross connection to contaminate a drinking water (potable water) supply, three things must happen **simultaneously:**

1. The potable water supply piping must be unprotected (or improperly protected) from a cross connection.
2. A physical cross connection must be made between the potable water supply piping and a contaminant source.
3. Backflow conditions must occur.

Backflow is the flow of water (or other solid, liquid, or gas from any source) back into the potable water supply. Backflow may be due to either:

- Backsiphonage.
- Backpressure.

Backsiphonage is backflow caused by a negative pressure (vacuum or partial vacuum) in the supply piping. Backsiphonage occurs when system pressure is reduced below atmospheric pressure. The effect is similar to sipping water through a straw.

This scenario shows how backsiphonage conditions could occur in a public water system:

- A public water system shuts off a main to repair a leak. The water main under repair is at the base of a hill.
- The water main is at a lower elevation than the homes on the hill. This creates a situation where water in the plumbing in the homes on the hill can drain into the public water system main.
- When a customer at the bottom of the hill uses water, it creates a siphon at households at the top of the hill and water drains out of their plumbing systems.
- At one household at the top of the hill, a garden hose is being used to fill a child's wading pool. The hose is submerged in the pool.
- When the backflow conditions occur, the nonpotable water from the wading pool is siphoned through the cross connection (submerged hose) into the household plumbing and then into the water main.
- The water from the wading pool contaminates the water main.
- When water service is restored, contaminated water is delivered to customers served by the public water system.

Backpressure is backflow caused when pressure in the customer's plumbing is greater than the pressure in the water supply piping. The higher pressure in the customer's plumbing may be from a booster pump, heating boiler, and so on.

The following scenario shows how **backpressure backflow** could occur in a water system:

- The fire department withdraws water from a hydrant. This reduces the pressure in the public water system main from 50 pounds per square inch (psi) to 20 psi.
- A customer served by the public water system installed a lawn irrigation system. The customer’s irrigation system is supplied with water from a pond. The pump supplying the irrigation system operates at 30 psi. To ensure a supply for the irrigation system when the pond is dry, the customer installed a standby connection to the household plumbing (potable water piping).
- On the day of the fire flow situation, the normally closed valve between the household plumbing and irrigation piping is accidentally left open.
- Backflow wouldn’t normally occur at this customer’s connection, because the pressure in the public water system is greater than the pressure supplied by the irrigation pump.
- However, during the fire flow situation, the pressure from the irrigation pump is greater than the pressure in the water main. Water from the pond is pumped into the household plumbing and then into the public water system main.
- When the fire flow ends, pressure in the public water system water main increases, and contaminated water is delivered to customers served by the system.

Item 92	Does the water system serve a single connection?
Guidance	A single connection water system serves one building. Advise the purveyor that he or she has certain legal responsibilities under the Uniform Plumbing Code to control the cross connections within that building.
How to mark the checklist	Mark "Yes" if the water system serves a single building.
Classification	Informational
WAC reference	
Publications	
Webpage(s)	
Standard language	None
Other notes for the sanitary surveyor	There is no premises isolation requirement for a water system that serves a single building (WAC 246-290-490). If the single building is a restaurant, convenience store, or other commercial use with a carbonated beverage dispenser, remind the owner that she or he is responsible under the Uniform Plumbing Code (and locally adopted codes) to ensure the appropriate cross-connection control assembly is installed between the carbon dioxide injection point and the rest of the plumbing in the building.

Item 93	**Is the water system known to serve one or more high health hazard premises, such as those listed in Table 13 of WAC 246-290-490.**
Guidance	This question requires knowledge of the types of high health hazard premises listed in Table 13
How to mark the checklist	Mark "Yes" if the water system serves one or more customers described in Table 13. Then record which of these types of premises the water system serves in the comments section of Part K. Refer to these notes as you respond in writing to Item 95 and Item 96.
Classification	Informational
WAC reference	WAC 246-290-490
Publications	*Cross Connection Control for Small Water Systems* 331-234 (PDF) *Responding to a Backflow Event* 331-494 (PDF)
Webpage(s)	Cross-Connection Control and Backflow Prevention USC Foundation for Cross-Connection Control and Hydraulic Research: List of Approved Backflow Prevention Assemblies BAT List - Backflow Assembly Testers - Washington Certification Services (greenriver.edu) Cross-Connection Control Specialist Public List
Standard language	None
Other notes for the sanitary surveyor	Table 13 lists high health hazard premises requiring premises isolation (WAC 246-290-490 (4). **Severe* and High Health Cross-Connection Hazard Premises that Require Premises Isolation by Air Gap or Reduced Pressure Backflow Assembly** Agricultural (farms and dairies) Beverage bottling plants Car washes Chemical plants Commercial laundries and dry cleaners Premises where both reclaimed water and potable water are provided Film processing facilities Food processing plants Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers Premises with separate irrigation systems using the purveyor's water supply and with chemical addition+ Laboratories Metal plating industries Mortuaries Petroleum processing or storage plants Piers and docks Radioactive material processing plants or nuclear reactors* Survey access denied or restricted Wastewater lift stations and pumping stations Wastewater treatment plants* Premises with an unapproved auxiliary water supply interconnected with the potable water supply _____ + For example, parks, playgrounds, golf courses, cemeteries, estates, etc. * RPBAs for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.

Item 94	**Has the purveyor established the legal authority to implement a CCC program? (formally adopted ordinance, resolution, by-law, or other document defining the purveyor's CCC program requirements, and empowering the purveyor to enforce them)**
Guidance	The first step in developing a CCC program is a locally adopted ordinance or by-law that defines the scope of the purveyors and customers' responsibility.
How to mark the checklist	Mark "Yes" if the purveyor shows you a copy of their local ordinance or by-law enabling implementation of a CCC program.
Classification	Observation if marked "No."
WAC reference	WAC 246-290-490
Publications	*Cross Connection Control for Small Water Systems* 331-234 (PDF) *Responding to a Backflow Incident* 331-494 (PDF)
Webpage(s)	Cross-Connection Control and Backflow Prevention USC Foundation for Cross-Connection Control and Hydraulic Research: List of Approved Backflow Prevention Assemblies BAT List - Backflow Assembly Testers - Washington Certification Services (greenriver.edu) Cross-Connection Control Specialist Public List
Standard language	Unless you own all the premises your water system serves, you must establish the legal authority to implement an effective cross-connection control program (WAC 246-290-490). The first step in developing an effective cross-connection control program is to develop the legal authority to implement your CCC program. Refer to *Cross Connection Control for Small Water Systems* 331-234 (PDF) or a certified cross-connection control specialist for guidance in establishing your authority found on our website Cross-Connection Control Specialist Public List.
Other notes for the sanitary surveyor	This item may apply to TNC and NTNC systems (WAC 246-290-490 (1)(b)). For example, if a noncommunity system operates a distribution system comprised of more than one connection, it is the noncommunity system purveyor's responsibility to protect that distribution system from backflow contamination. Legal authority is necessary to fulfill this responsibility.

Item 95, 95a, and 95b	**Has the purveyor designated a cross-connection control specialist (CCS) to be in responsible charge of the cross-connection control program?** **If yes, has the CCS conducted a hazard evaluation to identify high health hazard premises?** **If yes, has the purveyor completed installation of a backflow prevention assembly on the service line to each identified high health hazard premise?**
Guidance	The second step in developing a cross-connection control program is hiring a certified cross-connection control specialist, and completing a hazard survey. Only a cross-connection control specialist can determine whether a connection ("premises") is a high health hazard not otherwise listed in Table 9 and decide how to best control or eliminate the cross-connection hazard. A partial list of high health hazard premises is in WAC 246-290-490 (see Table 9).
How to mark the checklist	Mark **Item 95** "Yes" if the purveyor has employed a certified cross-connection control specialist. Mark **Item 95a** "Yes" if the CCS already conducted a hazard assessment of all the purveyor's service connections. Mark **Item 95b** "Yes" if the purveyor met the premise isolation requirement for each identified high health hazard premise by installing the required premises isolation assembly on the service line. Mark **Item 95b** "N/A" if the CCS identified no high health hazards.
Classification	Observation if any answer is marked "No."
WAC reference	WAC 246-290-490
Publications	*Cross Connection Control for Small Water Systems* 331-234 (PDF) *Responding to a Backflow Incident* 331-494 (PDF)
Webpage(s)	Cross-Connection Control and Backflow Prevention USC Foundation for Cross-Connection Control and Hydraulic Research: List of Approved Backflow Prevention Assemblies BAT List - Backflow Assembly Testers - Washington Certification Services (greenriver.edu) Cross-Connection Control Specialist Public List
Standard language	**If the purveyor hasn't employed a CCS use paragraph 1.** **If the purveyor has a CCS but the purveyor's CCS hasn't conducted a hazard evaluation yet, use paragraphs 2 and 3.** **If the purveyor hasn't finished installing a backflow prevention assembly on the service line to each identified high health hazard premise, use paragraph 3.** 1. Employ a certified cross-connection control specialist (CCS) to develop and implement your cross-connection control (CCC) program (WAC 246-290-490). Implementation includes assessing the degree of hazard for each service connection the water system serves. The CCS must identify high health hazards and ensure that the appropriate cross-connection control assembly is installed on the service line to each high health hazard premise. A partial list of such premises is in Table 13 of WAC 246-290-490. You can view our certified Cross-Connection Control Specialist Public List . 2. Direct your cross-connection control specialist to conduct a hazard assessment of all service connections. The authority for this must be in your locally adopted CCC ordinance or by-law. 3. Under the direction of your CCS, ensure that the appropriate cross-connection control device is installed on the service line of each high health hazard premises.
Other notes for the sanitary surveyor	This item may apply to TNC and NTNC systems (WAC 246-290-490 (1)(b)). For example, if a noncommunity system operates a distribution system comprised of more than one connection, then it is the noncommunity system's responsibility to protect that distribution system from backflow contamination. It is necessary to hire a CCS to fulfill this responsibility.

Item 96	**Has a DOH-certified backflow assembly tester (BAT) tested each backflow prevention assembly installed for premises isolation within the past 12 months?**
Guidance	The third basic step in developing an effective CCC program is to ensure that a certified BAT tests each assembly once a year. The purveyor's communication with consumers and ability to maintain accurate records are important to implement this step successfully.
How to mark the checklist	Mark "Yes" if the appropriate cross-connection control assembly is in place at each high health hazard premise and a BAT tested the assembly within the last 12 months. If the purveyor states the assemblies were tested but can't prove it by showing you the test reports the BAT completed, mark Item 96 "No" and explain your answer in the comment section of Part K. Mark "N/A" if **Item 95b** is marked "N/A."
Classification	Observation if marked "No."
WAC reference	WAC 246-290-415 (6) WAC 246-290-490
Publications	*Cross Connection Control for Small Water Systems* 331-234 (PDF)
Webpage(s)	Cross-Connection Control and Backflow Prevention USC Foundation for Cross-Connection Control and Hydraulic Research: List of Approved Backflow Prevention Assemblies. BAT List - Backflow Assembly Testers - Washington Certification Services (greenriver.edu) Cross-Connection Control Specialist Public List .
Standard language	Develop and implement an effective cross-connection control program (WAC 246-290-490). We consider it a high priority for all purveyors to control or eliminate any cross-connection hazard presented by high health hazard premises such as [list the premises type present at the system]. A certified backflow assembly tester must test backflow assemblies at least every 12 months. A list of BATs is on our cross-connection control webpage. For resources and guidance, visit our Cross-Connection Control and Backflow Prevention webpage. Contact us if you have questions about steps you must take to comply with WAC 246-290-490.
Other notes for the sanitary surveyor	This item may apply to TNC and NTNC systems (WAC 246-290-490 (1)(b)). For example, if a noncommunity system operates a distribution system comprised of more than one connection, then it is the noncommunity system's responsibility to protect that distribution system from backflow contamination. Testing backflow assemblies by a BAT is necessary to fulfill this responsibility.

Item 97	**Did you observe the end of a hose connected to the potable water system submerged in a pool, hot tub, watering trough or other nonpotable body of water during the survey?**
Guidance	We don't expect you to search for such circumstances. However, if you see a submerged hose while conducting the field survey, you should mark this item "Yes." Instruct the operator to eliminate this type of cross connection by pulling the hose out of the water before the end of the survey. Then, record the issue as resolved in the comment section of Part K. This item relates to Item 47 and Item 55.
How to mark the checklist	Mark "Yes" if you observe an active, unprotected cross connection, such as the end of a hose submerged in a pool, hot tub, animal water trough, or other nonpotable body of water.
Classification	Significant deficiency if marked "Yes."
WAC reference	WAC 246-290-415 (6) WAC 246-290-490
Publications	
Webpage(s)	Cross-Connection Control and Backflow Prevention
Standard language	**If the purveyor cannot eliminate the cross connection during the survey:** Immediately eliminate the cross connection observed at _____ by creating an air gap (at least two times the pipe diameter), or terminate water service to the customer until an ODW-certified cross-connection control specialist conducts an inspection, recommends the appropriate cross-connection control device, and an ODW-certified backflow assembly tester installs and tests the device.
Other notes for the sanitary surveyor	If you already identified a cross connection hazard in Item 47 or Item 55, you don't need to repeat it in Item 97. If you observe an active, unprotected cross connection, ask the operator to take the steps needed to eliminate the cross connection during the survey. • Document the finding in the checklist as it first appeared to you; answer this question "yes." • If the purveyor eliminates the cross connection during the survey, document what was done under comments in Part M. Be sure to reference the specific checklist item (Item 97 in this example). • In the survey report, include the problem as first observed in the Significant Deficiency section, and repeat the description you wrote in Part M, which should clearly indicate that you witnessed the fix.

NOTE: THIS QUESTION ONLY APPLIES TO A FACILITY OPERATING A SEWAGE DUMP STATION.	
Item 98	**Is there a sewage dump station without a reduced pressure backflow assembly on the water supply line?**
Guidance	This question only applies to parks that are public water systems. We don't expect you to inquire about dump stations operated within a park that is a customer of a larger water system.
How to mark the checklist	Mark "Yes" if there is a sewage dump station **and** there is no reduced pressure backflow assembly on the water supply at the dump station. Mark "No" if there is a sewage dump station and there is a reduced pressure backflow assembly in place on the water supply at the dump station. Mark "N/A" if there is no dump station, or if there is a dump station but there is no water supply available there (this would rarely occur).
Classification	Significant deficiency if marked "Yes."
WAC reference	WAC 246-290-415(6) WAC 246-290-490
Publications	
Webpage(s)	Cross-Connection Control and Backflow Prevention USC Foundation for Cross-Connection Control and Hydraulic Research: List of Approved Backflow Prevention Assemblies BAT List - Backflow Assembly Testers - Washington Certification Services (greenriver.edu). Cross-Connection Control Specialist Public List
Standard language	Hire an ODW-certified cross-connection control specialist to identify the appropriate way to eliminate or control the cross-connection hazard, purchase the appropriate assembly, and have a certified backflow assembly tester install and test the assembly. Submit a photograph of the installed assembly and the test results.
Other notes for the sanitary surveyor	**VERY IMPORTANT: In the comment section of Part K, note whether the reduced pressure backflow assembly (RPBA) is installed vertically or horizontally, record the manufacturer and model number, and the last test date and test result.** Also photograph the assembly. We will confirm that the RPBA is on the approved list of assemblies and approved for the vertical or horizontal installation.

Checklist Part L: Operator

All community, non-transient non-community (NTNC), and some transient non-community (TNC) systems must employ a certified operator to carry out various operational functions. To become certified, operators must meet minimum education and experience requirements and pass an exam. In addition, certified operators must meet a professional growth requirement every three years to maintain their certification status.

Item 99	Is the water system operator certified?
Guidance	All community and NTNC water systems must employ a certified operator. Some TNC water systems must employ a certified operator, including those that operate CT6/4-log virus inactivation treatment or other complex treatment and those that reach a level of significant noncompliance with one or more requirements of chapter 246-290 WAC.
How to mark the checklist	Mark "Yes" if the purveyor currently employs a certified operator.
Classification	Informational. If the operator of record is no longer employed, and the purveyor hasn't hired a replacement certified operator, make a note in the comments section of Part L. We will refer the issue to our Operator Certification and Training Section for follow-up.
WAC reference	Chapter 246-292 WAC
Publications	
Webpage(s)	Waterworks Operator Certification
Standard language	None.
Other notes for the sanitary surveyor	Community, NTNC, and **some** TNC water systems that serve 250 people or less, and apply no treatment other than simple chlorination must employ an operator certified as at least a **Water Distribution Specialist**. This should cover most of the systems you survey. **What the operator must know to pass the Water Distribution Specialist (WDS) Exam.** **Operate system** System Design • Flushing program • System layout • Assess system demand System Inspection • Cross-connection surveys/control • Well inspection Chlorine Disinfection • Monitor, evaluate, and adjust disinfection process **Water Quality Parameters and Sampling** • Chlorine demand/residual/dosage • Coliform **Operate equipment** • Chlorinators • Hydrants • Pumps • Valves **Install, Maintain and Evaluate Equipment** Install and Maintain Equipment • Pipe repair • Water mains • Service connections • Storage tanks Evaluate operation of equipment • Read meters • Troubleshoot electrical equipment **Perform Safety Procedures** • Chemical handling • Confined space entry • Fire safety • Lock-out and tag-out

Item 99	Is the water system operator certified?

Perform Administrative and Compliance Duties

Administrative and Security

- Respond to complaints
- Develop operation and maintenance plan
- Record and evaluate data

Comply with Drinking Water Regulations

- Subpart B-Maximum contaminant levels
- Subpart C-Monitoring and analytical requirements
- Subpart D-Reporting and recordkeeping
- Subpart Q-Public notification of drinking water violations

Operate system

- Add liquid disinfectants
- Monitor, evaluate, and adjust chlorine disinfection
- Inspect and maintain flow measurement
- Inspect, maintain, and repair wells

Evaluate characteristics of source water

- Bacteriological
- Biological
- Chemical

Collect, perform and interpret laboratory analyses

- Chlorine demand
- Chlorine residual
- Microbiological

Operate equipment

- Chemical feeders
- Instrumentation
- Pumps

Evaluate operation of equipment

- Check speed of equipment
- Perform preventive maintenance on chemical feeders
- Read meters
- Read pressure gauges

Perform administrative duties

- Administer safety program
- Establish recordkeeping systems for facility operation
- Record information relating to facility performance

Establish safety plans and apply safety procedures

- Chemical hazard communication
- Confined space entry
- Electrical grounding
- General safety and health
- Lock-out and tag-out
- Personal protective equipment
- Respiratory protection

The passing score for this exam is 70 percent.

Item 100	**Describe the operator's certification level (if certified), duration of employment with this water system, and relationship with the system (contract operator, SMA, direct-hire employee, volunteer, temporary, or owner).**
Guidance	We want to know the type of operator (certified or not) and the relationship the operator has to the water system.
How to mark the checklist	Please record this information under Item 100 in Part L.
Classification	Informational.
WAC reference	Chapter 246-292 WAC
Publications	
Webpage(s)	Waterworks Operator Certification
Standard language	None.
Other notes for the sanitary surveyor	**Duties of a certified operator in responsible charge (WAC 246-292-032)** 1. A certified operator the purveyor designates to be in responsible charge as required by law must perform or manage the public water system's daily operational and maintenance activities**(**WAC 246-292-020), and according to acceptable public health practices and water industry standards. 2. A certified operator in responsible charge or a designee must be available on-site, or able to be contacted immediately by telephone or other electronic communication 24 hours a day, every day, and be able to initiate appropriate action within two hours of contact. Appropriate action may include, but is not limited to either: a. Making necessary repairs or resolving problems. b. Directing staff or contractors to make necessary repairs or resolve problems. 3. The duties of a certified operator in responsible charge or designee include, but are not limited to: a. Conducting water quality monitoring, maintaining adequate records, and taking follow-up action needed to comply with state and federal drinking water regulations. b. Implementing preventive maintenance programs, inspecting treatment and other public water system components for malfunctions, maintaining adequate records, and making needed repairs. c. Analyzing, reviewing, and maintaining records of instrument readings and lab test results, determining the location and causes of any malfunctions, adjusting various treatment processes or other components. d. Implementing a cross-connection control program, if directed by the purveyor. e. Determining and implementing remedial actions in an emergency and, if applicable, following departmental directives. f. Cooperating during a special purpose investigation or sanitary survey as required (chapter 246-290 WAC). g. Providing required records and reports to DOH or its representative on request. Failure to operate the water system according to state and federal drinking water laws and regulations could result in the suspension or revocation of an operator's certification.

Item 101	Does the operator conduct self-inspections of the water system?
Guidance	Our initial notification letter explains that we expect the operator to conduct routine self-inspections of the water system facilities, with a focus on identifying and fixing any significant deficiencies and significant findings before the survey.
How to mark the checklist	Mark "Yes" if the purveyor conducts routine self-inspections of the water system. Record the scope and frequency of such inspections in the comments section of Part L.
Classification	Recommendation if marked "No."
WAC reference	Chapter 246-292 WAC
Publications	
Webpage(s)	Waterworks Operator Certification
Standard language	We recommend that you conduct routine, meaningful self-inspections of your facilities. Use our sanitary survey checklist as a guide to identify circumstances that are or may become significant deficiencies or significant findings.

Other notes for the sanitary surveyor	Other WAC 246-292 main points.
	• TNCs must employ a certified operator if:
	  ○ The purveyor incurs repeated violations (coliform water quality, nitrate or coliform sampling).
	  ○ The water system applies groundwater disinfection to meet a 4-log treatment requirement.
	  ○ The water system operates a purification plant, such as surface water treatment, nitrate removal, iron and manganese removal, or desalination.
	• A certified operator (including a contract operator) is expected to be in a position to respond to emergencies 24/7, and be in a position to begin taking steps to mitigate within 2 hours.
	• A certified operator is expected to participate in sanitary surveys and special purpose investigations, and to participate in resolving deficiencies.
	• A purveyor must notify us within 30 days of a change of operator or vacated operator position.
	Our certification program reviews the scope of each contract operator's contract with a water system. We evaluate the contract to ensure it meets the duties of the operator in responsible charge (WAC 246-292-032). See Item 100.
	Certified operators must operate the water system consistent with experience and training appropriate to their level of certification and must perform their duties according to state rules (WAC 246-292). Certified operators are accountable for the actions taken by their designees.

Item 102	**Is the operator performing measurements and calibration of water treatment monitoring equipment consistent with manufacturer recommendations?**
Guidance	For example, is the purveyor using an approved method to measure chlorine residuals, such as DPD colorimetric test kit ("color wheels") or digital colorimeter? Water Quality Testing and Analytical Instruments | Hach and LaMotte Company : Water Quality and Analytical Testing Equipment are among manufacturers that produce common field test kits.
How to mark the checklist	Mark "No" if you believe the operator is not using the proper instruments and methods to perform field measurements for free chlorine, nitrate, pH, or other drinking water parameters that must be measured in the field for compliance purposes. Record your thoughts in the comment section of Part L. Color wheels are not approved to measure chlorine residual for CT6 and 4-log virus treatment. Mark "NA" if the operator performs no water treatment monitoring.
Classification	If marked "No," this will be referred to our Operator Certification and Training Section for follow-up.
WAC reference	WAC 246-290-300
Publications	
Webpage(s)	
Standard language	I am concerned that the method and/or equipment used to measure [name the water quality parameter] are not appropriate. ODW may contact you to inquire into your methods of measurement, analysis and calibration of your water treatment monitoring equipment.
Other notes for the sanitary surveyor	You should check the following for each purveyor measuring free chlorine in the distribution system. 1. Is the purveyor using expired test kit reagent packets? 2. Is the reagent designed to measure total chlorine instead of free chlorine? 3. Is the volume of water mixed into the reagent consistent with the reagent's designated use? (For example, do they wrongly add a 5 ml reagent into 10 ml of water?) 4. Is the recorded value for free chlorine measurements outside the specified range of the test kit? (For example, does the operator record a value of 0.05 mg/l when the accuracy of the test kit is only down to 0.1 mg/l?) 5. Does the operator misinterpret the measured value? (For example, did the operator record the free chlorine concentration as 2.0 mg/l when it really measured at 0.2 mg/l?) 6. Does the operator properly establish a "zero" value for the digital colorimeter? 7. The presence of manganese in water will result in over-estimating the level of free chlorine residual in the distribution system. Is there a possibility of manganese interference with the free chlorine test used? Document any concerns with the measurement method, analysis, or calibration of the water quality monitoring devices under comments in Part L. We will follow-up. The certified operator (CO) may have delegated responsibility for chlorine residual monitoring to an uncertified person. That is acceptable if the CO remains in responsible charge of the work the delegate performs (chapters 246-290 and 246-292). If you have concerns about the operator's practices or ability to measure and calibrate water treatment monitoring equipment correctly, share your concerns with the operator and us.

Item 103	**Is the operator using proper inputs to treatment plant operations reports (such as correct volume, peak flow rate, time) and making the proper calculations?**
Guidance	The most common treatment operations you'll observe that require more than simply measuring the concentration of some drinking water parameter is CT6/4-log virus disinfection of a groundwater source prior to the first connection. See checklist Item 46, Item 51 and Item 52. Together with the operator, review their monthly chlorination water treatment plant report form. Ask the operator to explain every step of his or her daily process—from measurement, to calculation, to final input on the form.
How to mark the checklist	Mark "No" if you believe the operator is using improper inputs to treatment plant operations reports. Record your thoughts in the comment section of Part L. Mark "NA" if the operator performs no water treatment.
Classification	If marked "No," this will be referred to our Operator Certification and Training Section for follow-up.
WAC reference	WAC 246-290-300 WAC 246-290-480
Publications	*Measuring Free Chlorine* 331-442 (PDF) *Chlorine Contact Time for Small Water Systems* 331-343 (PDF)
Webpage(s)	
Standard language	I have concerns about the inputs used to measure and report compliance data for your water treatment system. ODW may contact you to inquire into your data collection and calculations.
Other notes for the sanitary surveyor	Common mistakes and improper inputs. 1. Math errors (addition, subtraction, multiplication, division). 2. Doing things the same way after something changes. For example, 20 years ago an operator calculated the need to add 0.4 mg/l of free chlorine to achieve CT6 at a specific compliance point prior to the first customer downstream of treatment. Since then: a. A new customer located closer to the source. Now the compliance point must move too, so it is prior to the first customer. b. The water system installed a new well pump, so the pumping rate is now 50 gpm more than it was 20 years ago. Now the water moves through the old pipeline quicker and gets fewer minutes of contact time before the first customer. 3. Measuring total chlorine instead of free chlorine. Free chlorine is the correct form of chlorine residual to measure for disinfection treatment reporting purposes. 4. Using total tank volume when a storage tank provides required contact time (dividing the total tank volume by the peak-flow rate to get the residence time of water in the storage tank). Storage tanks short-circuit water and provide poor mixing. So, to establish residence time correctly, you must discount the storage tank volume, usually by at least 90 percent when calculating chlorine contact time for a single inlet-outlet pipe in the storage tank. (If low operating level in the storage tank equals 100,000 gallons, the correct calculation for residence time would be no more than 10,000 gallons divided by the peak flow rate **out** of the tank). For example, a purveyor has a 4,000-gallon storage tank that he allows to be drawn down to a volume of 2,000 gallons before the well pump comes back on. Chlorine is added to the well water entering the tank. The booster pump taking water out of the tank pumps at a maximum of 200 gpm. The maximum chlorine contact time in the tank, assuming the inlet and outlet pipes are separated inside the tank, would be 2,000 divided by 200 = 10 minutes. 5. Using average flow rate instead of peak flow rate. Peak flow rate should be used in the calculation. 6. Incorrectly measuring the length or volume of the pipe used for chlorine contact time before the first customer. If you have concerns about the operator's practices or ability to use proper inputs to measure and report compliance data, share them with the operator and explain that you will relay them to DOH.

Item 104	Does the operator take water quality compliance samples at the proper location?
Guidance	Sampling from an improper location may defeat the purpose of the sampling. Below, we explain where we expect the operator to collect some of the most common samples. The SWSMP guide devotes a section to developing monitoring plans (coliform, source chemicals, treatment-related). See Item 3.
How to mark the checklist	Mark "No" if you are certain that the operator is collecting water quality samples from an improper location. Record your thoughts in the comment section of Part L. There is no "NA" option on the checklist. Every operator must collect some water quality samples, even when there is no water treatment.
Classification	If marked "No," this will be referred to the ODW Operator Certification and Training Section for follow-up.
WAC reference	WAC 246-290-300, -310, and -320
Publications	*General Sampling Procedure* 331-219 (PDF) *Preparing a Coliform Monitoring Plan* 331-036 (PDF) *Preparing a Coliform Monitoring Plan for Single Source System* 331-240 (PDF) *Volatile Organic Chemical (VOC) Sampling Procedure* 331-220 (PDF) *Inorganic Chemical (IOC) Sampling Procedure* 331-221 (PDF) *Nitrate Sampling Procedure* 331-222 (PDF) *Haloacetic Acid (HAA5) Sampling Procedure* 331-223 (PDF) *Synthetic Organic Chemical (SOC) Sampling Procedure* 331-224 (PDF) *Coliform Distribution System Sampling Procedure* 331-225 (PDF) *Total Trihalomethane (TTHM) Sampling Procedure* 331-226 (PDF) *Lead and Copper Sampling Procedure* 331-227 (PDF)
Webpage(s)	Preparing a Coliform Monitoring Plan
Standard language	I have some concerns about where you are sampling water quality for compliance reporting. ODW may contact you to inquire further into where you collect your compliance samples.
Other notes for the sanitary surveyor	**Routine Coliform:** Take routine samples from a representative location in the distribution system. Do not take them at a source. See *Preparing a Coliform Monitoring Plan* 331-036 (PDF) and *Preparing a Coliform Monitoring Plan for Single Source System* 331-240 (PDF) **Repeat Coliform:** Take repeat samples from the distribution system at the original site of the unsatisfactory routine sample, at a site within 5 connections up- and down-stream of the unsatisfactory routine sample, and at another location in the distribution system. **Triggered Source Coliform Samples:** Take a triggered source sample from each source operating when the unsatisfactory routine sample was collected. **Source chemicals** (inorganic, volatile organic): Take samples from the source after any treatment. **Common concerns and errors.** Distribution system samples (coliform, chlorine residual, lead, and copper) collected from a residence or business with its own water treatment facility (softener, carbon filter). Well field sample collected from one well instead of a location where the production from all the wells in the well field comes together prior to entering the distribution system. If you have concerns about sampling practices, share them with the operator and explain that you will relay them to ODW.

Not on checklist	**ADDITIONAL SURVEYOR COMMENTS ABOUT THE CERTIFIED OPERATOR** **You should consider the following questions after completing the survey. Share your comments with DOH without disclosing them to the operator:** **Is the certified operator in responsible charge carrying out his or her duties as outlined in regulation?** **Is the water system operating a primary contaminant treatment facility without appropriately certified personnel?**
Guidance	For information on the duties of a certified operator (Office of Drinking Water Rules), refer to WAC 246-292-032.
Contact ODW	If you have reason to believe the operator is not performing the functions a certified operator must perform, call our Operator Certification and Training Section at 1-800-525-2536 immediately after completing the survey. Depending on the evidence, we may begin a formal investigation into the allegation.
Classification	This is a program referral to our Operator Certification and Training Section. Pending the outcome of ODW's investigation, this may be a Significant Deficiency.
WAC reference	Chapter 246-292 WAC
Publications	
Webpage(s)	Waterworks Operator Certification
Standard language	NA
Other notes for the sanitary surveyor	If you observe the certified operator in responsible charge knows nothing or almost nothing about the water system, report your observations to our Operator Certification and Training Section. Identify specific gaps in knowledge about the water system. This lack of knowledge may reflect the certified operator's failure to fulfill the duties in WAC 246-292-032. You may request a copy of the SMA or the contract between the water system and the contract operator from the Operator Certification and Training Section.

Not on checklist	**ADDITIONAL SURVEYOR COMMENTS ABOUT THE CERTIFIED OPERATOR** **You should consider the following question after completing the survey, without disclosure to the operator:** **Do you have any reason to suspect false or misleading reporting of water quality, treatment operations, status of previously identified significant deficiencies, or completion status of mandatory public notification?**
Guidance	Fraudulent reporting is an extremely serious offense, with potentially harsh punishment. Fraudulent reporting means the operator intentionally reports false or misleading information, even if others direct him or her to do so.
Contact DOH	If you have reason to believe the operator intentionally misled us, you should contact ODW's Operator Certification and Training Section at 1-800-525-2536 immediately after completing the survey. Depending on the evidence, we may begin a formal investigation into the allegation.
Classification	This is a program referral to our Operator Certification and Training Section. Pending the outcome of our investigation, this may be a Significant Deficiency.
WAC reference	Chapter 246-292 WAC
Publications	
Webpage(s)	Waterworks Operator Certification
Standard language	None.
Other notes for the sanitary surveyor	

Checklist Part M: Field Notes and Other

You should list:

- All tests the operator or the surveyor performed.
- All physical measurements the operator or the surveyor made.
- All repairs the operator or owner made. The surveyor should NEVER make repairs to the water system.

Checklist Part N: Supplemental Notes and Safety Concerns

You should include a description of any problem that you want us to consider a Significant Finding or an item for referral to an ODW program specialist. See sections 5.1 and 5.2.

If you find unsafe conditions in the field and you feel you have competent knowledge of basic safety standards, we encourage you to point out the safety hazard and refer the operator to the Department of Labor and Industries (L&I) consulting services. L&I has regulatory authority over workplace safety. Let the operator know that L&I provides free technical assistance (consultations) to water systems that want help identifying and correcting issues, and share the L&I safety consultants Consultant Near You. You should NOT list safety hazards as a deficiency**.**

Examples include confined spaces, climbing hazards, obvious electrical hazards, aggressive dogs, and unsafe structures. Notes on these subjects will help to prepare the surveyor who performs the next sanitary survey.

Checklist Part O: Water System Facilities Field Schematic

Schematics should illustrate the flow of water from source to the distribution system. They should include all sources (showing each entry point), reservoirs, points of treatment and disinfection, distribution system, and interties. For common shapes, use the symbols provided by copying them and positioning them electronically onto the blank space on the page.

Checklist Part P: Inventory of Potential Contaminant Sources

Identify potential sources of contamination on the blank portion of the page by type and distance, and complete the table of SCA features.

Appendix B: Water Facilities Inventory (WFI)

See Instructions for Completing the WFI 331-621 (PDF).

When and How to Update your WFI

General Information

- **Do not** submit Water Facilities Inventory (WFI) updates on your Annual Fee Statement. You **must** submit updates on your current WFI form.
- You can download a copy of your current WFI at Sentry Internet, but it cannot be updated online at this time.

When to Update your WFI

- Purveyors and managers are responsible for downloading, updating, and returning their WFI **annually** and **within 30 days of any change of WFI information**.

Annual WFI Update Schedule

Type of System	Reminder sent to Purveyors	Submit to DOH by
Group A—Community systems with **more** than 500 services and SMA owned systems	October	December 15
Group A—Community systems with **less** than 500 services	January	March 15
Group A—TNC and NTNC Systems	April	June 15
Special Groups—State Parks, National Parks, Forest Services, etc.	July	September 15

How to Download a Copy of your Current WFI

1. Go to the WFI page in Sentry Internet.
2. Read the Disclaimer, select "I Accept," and then click "Submit."
3. Enter your Water System ID number in the "Water System ID" field, then click "Submit." *Note*: You can download multiple WFIs by separating each PWS ID with a comma, but no extra spaces. (Example, "ab999,ac394,98765")
4. The WFI will display. You can print or download the WFI to be updated and returned.

How to Update your WFI

1. Review each field to ensure the information on the WFI is correct.
2. **To make corrections or update information**, use red ink or a red font. Cross out the outdated information on the WFI, then write or type the correct information right next to it.
3. If all the information is correct and there are no changes to make, mark box 35, "Update—No Change".
4. Add your Signature, Printed Name, Title, and the Date.

Required Contact Information for Owners and Primary Contacts:

This information is critical! Please ensure ALL contact information in fields 6, 7, 9, and 10 is accurate! This allows us to contact the right person during an emergency. Fields

6 and 9 are only for Primary Contact information. Fields 7 and 10 are only for legal Owner information.

Please include the following.

- Full name including middle initials—no nicknames or initials.
- Mailing address—if mailing address is a PO Box; street address is also required.
- Daytime, evening, and cell numbers.
- Email address.

Additional Online Assistance

- To access WFI program information, visit our WFI website.

Transfer of Ownership

We require the owner who transfers ownership to a new purveyor to submit the following before DOH can process the transfer.

- Updated WFI, include water system Name and ID on each document submitted.
- Copy of newly recorded deed showing seller and current legal owner of the water system/property.
- New Owner's name and contact information.
- New Owners that are a Legal Entity (Inc., LLC, etc.) must also provide the name and contact information for the Legal Entity and two governing members. Feel free to use a separate piece of paper.

Return your Updated WFI

There are two options for returning your updated WFI.

- Email Headquarters WFI Office: send PDF copy to wfi@doh.wa.gov.
- Email Eastern Region WFI Office: send PDF copy to wfi.ero@doh.wa.gov.
- Mail: send paper copy to Central Services WFI, PO Box 47822, Olympia, WA 98504-7822

Contact Us

If you have any questions or need assistance, contact us directly.
Central Services—WFI 360-236-3042
Eastern Regional Office 509-329-2100
Northwest Regional Office 253-395-6750
Southwest Regional Office 360-236-3030

References

WAC 246-294-030
WAC 246-294-060
WAC 246-290-035
WAC 246-290-120(6)
WAC 246-290-480(2)

Instructions for Completing the WFI

*To make corrections or update information, cross out outdated information then write or type correct information next to it, using **red** ink or a **red** font.*

Field Number and Name	Instruction
ADDRESSES AND PHONE NUMBERS	
6. Primary contact name and mailing address	Enter contact person's name for the water system's day-to-day operations. We will send most DOH mailings to this person.
	Enter only the mailing address in this part of the box. (Do **not** combine a PO Box with a street address.) Enter the **Physical Delivery Address** for the contact person if it is different from the normal mailing address. (We will use this address to ship sampling containers or other materials that cannot be delivered to a PO Box.) Example. Name and Mailing Address Ann Smith ATTN (optional) PO Box 3030 Anytown WA 98000 Physical Delivery Address, if different from above ATTN (Optional) 1231 Main St Anytown WA 98000
7. Owner name and mailing address	Enter name of person or organization that is the water system's legal owner. Follow directions and example in field number 6 (above). If owner is an organization, there **must** be an individual listed as contact for the organization.
9. 24-hour primary contact information	Enter phone number(s) and fax number, including area code (and extension, if applicable) for primary water system contact. Email address may be for the system or the primary contact.
10. Owner contact information	Enter the phone number(s) and fax number including area code (and extension, if applicable) for water system owner.
CHECK BOXES	
11. Satellite Management Agency (SMA)	If system is **NOT** owned or managed by an SMA, check "Not Applicable" and go to box 12. If system **IS** owned or managed by an SMA, check applicable box and enter name of the SMA. (SMA number is assigned by DOH.)
12. Water system characteristics	Mark **ALL** boxes that apply to your system. You may check more than one box for each service (e.g., a restaurant may be "Food Service" and "Commercial"). **Agricultural—**Commercial crop irrigation/farming. **Commercial/Business—**Office and retail complexes, nurseries, golf courses.

	Day Care—Child or adult care facilities (in home or stand-alone where the clients do not live 24 hrs. per day). **Food Service/Food Permit**—Restaurant, coffee shop, bakery, tavern, catering facility, deli, grocer, mini-mart. **1,000 or more person event** for two or more days per year—Major event that has a significant impact on your system like a fair, town festival, major concert. **Hospital/Clinic**—Medical/dental office or clinic, surgery center, emergency care facility. **Industrial**—Manufacturing, assembly facility, food processing facility. Licensed Residential Facility—Nursing home, adult boarding home, foster home. **Lodging**—Hotel, motel, inn, bed and breakfast, resort. Recreational/RV **Park**—Connections serving parks, beaches, ball fields, playgrounds, campgrounds, picnic areas, ski areas, transient recreational vehicle facilities. **Residential**—Units designed to house one or more family(ies), (e.g., single family houses, apartments, duplexes, and condominiums, mobile home park, etc.) regardless of how many days per year it is occupied. **School**—K-12 grades, community college, technical training facility, colleges. Temporary Farm Worker Housing/Labor Camp: Facility that provides temporary facilities for workers and their families. May or may not meet the criteria for DOH Temporary Worker Housing licensing. **Other**—If choosing "other," please write a brief description in the blank provided (fire station, fraternal organization, grange).
13. Water system ownership	Mark only one type of organization that best describes water system owner. **Association**—A non-government water system owned by its consumers (sometimes referred to as members). It includes "mutual" water companies. **City/Town**—A city or town incorporated in accordance with the applicable RCW. **County**—A water system owned by county government such as a county park or public works maintenance facility. **Federal**—A water system owned by the federal government such as veterans' hospital, national park, forest service facility. **Investor**—A privately owned water system where the water system is operated with the intent of making a profit. The owner may be regulated—or potentially regulated—by the Washington Utilities and Transportation Commission (WUTC). **Private**—A privately owned water system, not including associations, where the water system is not operated with the intent to make a profit. Examples: water systems serving mobile home parks, stores, industries, etc. **Special District**—A special purpose district created in accordance with the applicable RCW such as a water or sewer district, public utility district, school district, fire district, or port district. **State—**A water system owned by the state such as a state park, correctional facility, or department of transportation rest area or maintenance facility.
14. Storage capacity	Enter total storage capacity (in gallons) available for distribution to users (if 1,000 gallons or greater). Do **not** include pressure tank(s) in total.

SOURCES	
16. Source name	Enter your name for the source (i.e., Park Well). If source is purchased or an intertie, list system name providing water. Each well in a well field or spring in a spring field must be identified. Please provide well tag number if available.
17. Intertie	Enter ID number of system providing purchased water or intertie. If you do not know the ID number, contact your DOH regional office.
18. Source category	Mark the box that best describes this source. Each source can have only one code. Each well in a well field and spring in a spring field must be identified individually.
19. Use	Mark the box that best describes how this source is used. **Permanent—**A source regularly used each year for **more than three consecutive months within a 12-month period**. For systems that are in operation for three or less months, their sources shall also be considered permanent. **Seasonal—**A source used on a regular basis and does not meet the definition of either permanent or emergency source. Seasonal source **could** be used to supply peak demand. **Emergency—**A source approved by DOH for emergency use and is **not** used for routine or seasonal peak water demands.
20. Source metered	Mark this box if this source has a water meter installed.
21. Treatment	If this source is not treated, mark the "none" box, otherwise mark the box(es) for each type of treatment provided for this source. If a well in a well field or spring in a spring field has its own individual treatment, mark the appropriate box. If all the wells in a well field or springs in a spring field are treated together at one location, mark the appropriate box on the well or spring field line. Treatment for an intertie refers only to **additional** treatment by the receiving system.
22. Depth to first open interval	For **cased** wells, enter depth to top of uppermost well screen or perforated casing; for wells **completed in rock**, enter depth to bottom of sealed casing. For **dug** wells, enter depth to first unsealed casing joint below well seal; and for well fields, enter depth of shallowest well. Round off to nearest whole number.
23. Capacity	Enter actual current source capacity, in gallons per minute (gpm) available to enter distribution system under operating conditions. Example: if source is a well with a pump test of 100 gpm, but only has a 20-gpm pump installed, enter 20 gpm.
24. Source location	Enter quarter/quarter designation, section number, township, and range location for each source. For example, SE/SW, Sec.1, T18N, R3E. Source locations can be found on well logs, water right documents, or property descriptions.

CONNECTIONS		
25-A. Full-time single-family residences	Enter number of single-family residences (including mobile homes) **occupied any 180 days or more a year** served by water system. If you enter a number in this field, enter a number in field 29 for corresponding population residing in these connections. A connection is considered active until physically disconnected from the water system.	
25-B. Part-time single-family residences	Enter number of single-family residences (including mobile homes) **occupied less than 180 days a year** served by water system. (These part-timers most likely inhabit vacation homes not used as a primary residence.) If you enter a number in this field, enter data in rows 30A and 30B for corresponding population residing in these connections. A connection is considered active until physically disconnected from the water system.	
26-A. Apartment buildings, condos, other multi-family buildings, barracks, dorms	Enter **total** number of apartment buildings, condo buildings, duplex buildings, barracks, and dormitory buildings etc., served by your water system. Enter the corresponding population use-days in rows #30B or #31A and #31B.	
26-B. Full time residential units	If the water system serves multi-family residential buildings, enter **total** number of residential units **occupied any 180 days or more a year**. If you enter a number in this field, enter a number in field 29 for corresponding population residing in these connections.	
26-C. Part time residential units	If the water system serves multi-family residential buildings, enter **total** number of individual dwelling units **occupied less than 180 days a year**. If you enter a number in this field, enter data in rows 30A and 30B for corresponding population residing in these connections.	
27-A. Recreational services and/or transient accommodations Call your regional office if unsure whether your system is community or non-community.	**COMMUNITY SYSTEMS**: Leave this field empty. Include in field 27B actual number of RV parks, campgrounds, hotels, motels, etc. served.	**NON-COMMUNITY SYSTEMS**: Enter actual number of RV sites, campsites, spigots, etc., and hotel/motel/overnight units served by water system. Enter corresponding non-residential population and use days in rows 31A and 31B.
27-B. Institutional, commercial, or industrial Services	**COMMUNITY SYSTEMS**: Enter number of all service connections not used for residential purposes. Include RV parks, campgrounds, hotels, motels, etc. in commercial connection counts. If you enter a number in this field, enter corresponding non-resident population and use-days in rows 31A, 31B, 32A, and 32B.	**NON-COMMUNITY SYSTEMS**: Enter number of all service connections not used for residential purposes and not otherwise accounted for in field 27A. If you enter a number in this field, enter corresponding non-resident population and use-days in rows 31A, 31B, 32A, and 32B.
POPULATIONS		
29. Full time residential population	Enter **TOTAL** number of residents served by water system for any 180 days or more per year.	
30-A. Part time residents per month	Enter **TOTAL** number of seasonal or weekend **residents** present **each month**. (These part-timers most likely inhabit vacation homes not used as a primary residence.)	

30-B. Part time resident use days per month	Enter how many days part-time residents are present each month.
31-A. Temporary & transient users per month	Enter **TOTAL** number of temporary or transient users served by water system **each month**. This includes all visitors, attendees, travelers, campers, patients, or customers with access to establishments connected to water system. Visitors must be counted for every day they have access to water system. For example, an individual attending a weeklong camping session (i.e., seven days) must be counted seven times. 100 non-residential individuals attend a five-day seminar: multiply 100 x 5 = 500. Add the 500 to any other TNC population **for that month.**
31-B. Temporary &transient use days per month	Enter **TOTAL** number of **days per month** this system is publicly accessible or available. If any business is open 30 days/month, enter 30 access days for the month.
32-A. Regular non-residential users per month	Enter the number of students, daycare children, and all employees served by the water system during each month who are **not already included in the full-time residential population count.**
32-B. Regular non-residential use days per month	Enter number of **days per month** that students, daycare children, and employees have access to water.
33. Routine Coliform Schedule	This schedule will show the minimum coliform samples that you need to take per month.
34. Nitrate Schedule	This schedule is intended for Group A—TNC water systems. For Group A—Community and Group A—NTNC water systems please refer to your Water Quality Monitoring Schedule (WQMS) for a nitrate monitoring schedule.
SIGNATURE	
35. Reason for submitting WFI	Check appropriate box. If DOH requested you submit this WFI, please refer to instructions in letter.
36. Certification	If your name and contact information is not entered in fields 6 to 10, also provide your telephone number, title, or relationship to water system under your printed name; then sign and print your name and the date you sign the WFI.

REQUESTED BY			
LHJ		Annual Update	
DOH		Non-periodic Update	
LAST UPDATE		New System	

SAMPLE WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM *Shaded areas to be completed by DOH* **Date Printed:**

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	OWNER NUMBER
Physical Delivery Address If Different From Above	Physical Delivery Address If Different From Above	

8. PRIMARY CONTACT INFORMATION	9. GENERAL CONTACT INFORMATION
Day Phone	E-mail Address
Evening Phone	Fax
Mobile/Cell Phone	Owner, Phone

10 PRIMARY CONTACT TITLE	15. SMA NUMBER (if applicable)	12. SMA MANAGEMENT (check only one)
	SMA NAME	ϒ Owned and Managed ϒ Managed Only

13. WATER SYSTEM CHARACTERISTICS (mark ALL that apply)

ϒ Agricultural	ϒ Hospital/Clinic	ϒ Residential
ϒ Church/Religious Organization	ϒ Industrial	ϒ RV Park
ϒ Commercial	ϒ Licensed Residential Facility	ϒ School
ϒ Day Care	ϒ Lodging	ϒ Temporary Farm Worker
ϒ Food Service/Food Permit	ϒ Mobile Home Park	ϒ Other
ϒ 1,000 or more person event for 2 or more days per year	ϒ Recreation	

14. WATER SYSTEM OWNERSHIP (mark only one)				15. STORAGE CAPACITY(in gallons)
ϒ Association	ϒ County	ϒ Investor, For Profit	ϒ State	
ϒ City	ϒ Federal	ϒ Private, Non-Profit	ϒ Special District	

16 SYSTEM SOURCE LISTING

17	18	19	20 SOURCE											21 SOURCE USE			22	23	24	25	26
SOURCE NUMBER	UTILITY'S NAME FOR SOURCE. IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN A SPRING FIELD	INTERTIE	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	(FEET)	(GPM)	SOURCE METERED	HYPOCHLORINATION	OTHER TREATMENTS
01																					
02																					
03																					
04																					
05																					
06																					

If this water system serves 500 or more residences, please enter the Number of residential connections on line 27 and then skip to line 34	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
27. SINGLE FAMILY RESIDENCES (How many of the following do you have?)			
A. Full Time Single Family Residences (Occupied 180 days or more per year)			
B. Part Time Single Family Residences (Occupied less than 180 days per year)			
28. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms			
B. Full Time Residential Units in Apartments, Condos, Duplexes that are occupied more than 180 days/year			
C. Part Time Residential Units in Apartments, Condos, Duplexes that are occupied less than 180 days/year			
29. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services (Campsites, RV Sites, Standpipes, etc.)			
B. Institutional, Commercial or Industrial Services			
30. TOTAL SERVICE CONNECTIONS			

31. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year?_____

32. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

33. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month are they present?												

34. ON GOING NON RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students, daycare children and/or employees are present each month?												
B. How many days per month are they present?												

35. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

36. GROUP B NITRATE SCHEDULE	**QUARTERLY**	**ANNUALLY**	**ONCE EVERY 3 YEARS**

37. Reason for Submitting WFI

Change **No Change** **Inactivate** **Re-Activate** **Name change** **Other** _____

I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE_____ **TITLE**_____

PRINT NAME_____ **DATE** _____