Sanitary Survey Manual

for

Community and
Non-Community
Public Water Supplies

Tennessee Department of Environment and Conservation

Division of Water Supply

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Sanitary Survey Manual for Community and Non-Community Public Water Supplies

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Introduction

The purpose of this manual is to assist staff members of the Division of Water Supply in conducting a sanitary survey of a public water system. It can also be used by a public water system (PWS) to conduct an internal review or self-assessment of their system. PWSs are encouraged to conduct self-assessments of their system using this manual and correct any deficiencies identified. A PWS is one that serves 15 or more connections and/or 25 or more individuals sixty days a year. This manual applies to community water systems (CWSs) and non-community water systems (NCWSs). This manual will also insure that the on-site investigations of public water systems in Tennessee will be conducted in the same manner statewide. Both existing staff members and new employees should benefit from having this manual.

A sanitary survey is an onsite evaluation and documentation of a water system's capabilities, operations, sources, facilities, treatment process, equipment, distribution network, monitoring, reporting and data verification, pump facilities, controls and overall management needed to continually provide safe drinking water and any deficiencies that might impact the provision of safe drinking water. Sanitary surveys provide an opportunity for inspectors to establish a field presence with the owners and operators of water systems in order to educate them about proper monitoring and sampling procedures, provide technical assistance, and inform them of any upcoming changes in regulations.

Sanitary Survey dates should not be announced to system personnel, except where absolutely necessary. Circumstances which may warrant advance notice prior to conducting the inspection, include water systems which are likely to be closed to inspectors should the inspection be unannounced. However, general correspondence informing a water system that the sanitary survey time is approaching and requesting that the water system identify dates of conflict is not prohibited.

Overall, the sanitary survey consists of a review of the records and documents held by the Department on the operation of a water system, an on-site inspection of both records held by the system and the operation and maintenance of the system, and a determination of potential problems which may affect the quality and/or quantity of water produced in the future. The person conducting the sanitary survey must have a basic understanding of the unit processes and chemistry used in water treatment and a knowledge of the Tennessee Safe Drinking Water Act (TSDWA) and the regulations which govern a water utility.

This manual has been divided into two major parts. The first portion of the manual deals with setting up the sanitary survey, conducting the field inspection, and preparing the report (survey letter) documenting the findings of the inspection. The second portion of the manual contains the guidance, inspection sheets, etc. to be used as a reference.

Items that apply to specific categories of public water systems are shown in the graphic boxes. Generally the explanation of the item will elaborate as to what systems are applicable under the requirement. Furthermore, items are grouped under the major headings of "System Management and Operation," "Operator Compliance," Source," etc.

This manual is a reference and provides guidance regarding conducting Sanitary Surveys; however, it is not, nor is it intended to be, a re-statement of the drinking water regulations. Consequently, it is recommended that a copy of the current rules and regulations and TSDWA be attached to this manual for reference.

It should be remembered that it is impossible to describe everything in this manual that should be considered when conducting a sanitary survey. The person(s) conducting the survey must be thoroughly knowledgeable of the operation of a public water system and the requirements the system must meet and use professional judgment in evaluating a facility.

General Outline to Conducting a Sanitary Survey

I. Preparation

The preparation phase is one of the keys to conducting a thorough sanitary survey. It is desirable to review as much information and data as possible in preparation for a survey. Adequate preparation provides better credibility with the water system and leads to more efficient use of time by preventing unnecessary return trips and review of data that could have been observed during preparation. In preparing for a sanitary survey, records and activities of the water system will be reviewed for the period since the last sanitary survey. In general, deficiencies will be assessed for violations that have occurred since the last sanitary survey. Enforcement action by the Division of Water Supply (DWS) may be taken against a public water system (PWS) and/or Certified Operator (COP) of the system at any time for violations of the SDWA or WEHA.

(A) Correspondence

One of the first items the inspector will check is the system's correspondence file which should contain previous sanitary survey results, complaints, Notices of Violation (NOVs), Notices of Non-compliance (NONCs), enforcement correspondence, letters from the plans review group (Engineering Section) on expansion/renovation of the plant or distribution system, notices of construction starts, results from other inspections, etc. Past sanitary survey results are an important part of the preparation process. Letters from several previous surveys should be reviewed to determine if there are persistent problems and how the system has responded to deficiencies cited by the Division. Deficiencies from the most recent survey should be noted so that those items can be checked more closely during the on-site survey.

(B) Complaints

System Category

CWS

If the water system is a community water system the system's complaint file needs to be examined as several areas of the survey relate to problems that occur in the distribution system. The state's file of complaints on a system should be compared with the system's file. Consideration should be given, however, in that some complainants may not have registered a complaint with the utility.

(C) Construction Projects

If the file contains letters from the Division's Engineering Section approving plans and specifications for construction then the inspector should check to make sure the water system has met its construction obligations. The inspector should note whether the file contains "Approvals" for the replacement or up-grading of any problem lines within the system. Plans are required for **all** new construction, including the installation of hydrants. Plans are not required for repairs replacing lines of the same size where a line has been lost due to a break or washout. Plans

and/or sketches of cartridge filter systems should be in the system's file if the system is a NTNCWS and ground water under the direct influence of surface water (GWUDI). CWSs are encouraged to notify the Division prior to beginning any construction which is under the system's control and must notify the Division prior to start-up. "System control" means the system is funding the project and has signed a contract for its construction or is constructing the project in-house or has assumed control. The inspector should check the system carefully for construction projects, and then see if there is documentation. If a line extension has been completed the Division and the system should have the results from the bacteriological examination of the new pipe or reservoir conducted by a state certified bacteriological lab. Also, the last distribution map (showing lines) sent to the Division of Water Supply should be reviewed to see if water service is being expanded to developing areas (new subdivisions, etc.). The distribution map must be no older than 5 years. In the field, inspectors should be attentive to areas with hydrants, meters, etc. that are not shown on the system's current distribution map.

An evaluation of system classification (as it relates to the T.C.A. 68-221-901 et seq, Water Environmental Health Act and the rules promulgated under that act) must be made. Reclassification of a water system may mandate that existing staff qualifying to operate the facility or that new staff be retained who meet requirements. The classification of water treatment plants and water distribution systems is based on population served, type of treatment employed and complexity of treatment required. (Refer to Rule 1200-5-3 for details regarding the classification of water treatment systems and operator certification requirements.)

(D) **Enforcement**

If Notices of Violation (NOVs) or Notices of Noncompliance (NONCs) are present in the file indicating violation of primary monitoring requirements or primary standards, then the inspector should look for evidence of public notification. If a system is currently under enforcement, then the inspector should contact the Division's Enforcement Coordinator to determine the status of the case and the best time for the system to be inspected. It may be desirable to coordinate a sanitary survey with a enforcement compliance schedule or to further document a situation pending enforcement. Under no circumstances should a sanitary survey be postponed if it causes the system to incur a violation. (NOTE: Under CFR part 141.21(d)(1)(i) and 1200-5-1-.07 a system may incur a violation if a sanitary survey is not conducted every five years. Under CFR 142.16(b)(3)(i) all community systems with either a surface water or ground water under the influence source must have a survey conducted every 3 years. Additionally, true ground water systems serving less than 50 connections or 150 persons must have sanitary surveys every three years.) Further, in accordance with the Division's Program Plan, it is the goal of the Division to conduct sanitary surveys of all Community and Non-Transient Non-Community water systems no less often than once every two years. All water systems under enforcement action or systems that have received an "Unsatisfactory" survey rating must have surveys conducted annually. If serious or potential health threatening violations are found during the survey, or numerous minor violations are found, a Notice of Non-Compliance (NONC) must be issued and a Compliance Review Meeting (CRM) scheduled or held at that time. Non-health threatening violations identified through a sanitary survey must be addressed with formal enforcement action if redundant in nature.

(E) **Bacteriological Results**

Results from the bacteriological analyses for the system should be checked to assure adequate sampling was performed. Sampling should correspond to the system's Bacteriological Sampling Plan (Section 5.B.). Systems must take samples throughout the month to comply with 1200-5-1-.07(1)(e). Any positive distribution or repeat sample must be followed by repeat samples. The

repeat samples must be taken within 24 hours of being notified of the positive result unless the State has agreed to another schedule. Repeat sampling must continue until all repeat samples are negative or the system determines they have exceeded the Bacteriological Maximum Contaminant Level (MCL). Any system collecting 1-39 samples per sampling period can have no more than one positive (showing the presence of coliform) sample. Systems collecting 40 samples or more per sampling period can have no greater than 5% of the samples positive. Systems taking fewer than 5 samples a month must take 5 routine samples the month following one or more positive samples. Systems must collect samples at regular time intervals throughout the month.

(F) **Turbidity/Treatment Technique Compliance**

Source				
Surface Water	True Ground Water (no filter)	True Ground Water (Iron/Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)

In preparation for a sanitary survey, turbidity data on MORs, filter performance reports, filter exceedance reports, etc. must be reviewed. Individual filter and combined effluent strip charts from continuous monitoring equipment must be reviewed during the course of the survey to ensure that accurate information is being recorded and/or reported. Equipment from data loggers, equipment calibration, filter profiles and/or Comprehensive Performance Evaluations (CPE) must be reviewed.

Systems Avoiding Filtration

Public water systems having a true ground water source are not required to monitor for turbidity unless specifically instructed in writing to do so. Sources determined to be true ground water are considered to be in approved sand and gravel formations (Rule 1200-5-1-.05(11).

Ground Water Systems with approved sand and gravel aquifers are not required to monitor turbidity unless directed to do so under the provisions of 1200-5-1-.05(11).

Ground Water Systems with a "true" ground water source (i.e. not under the direct influence of surface water) that serve more than 50 connections and are directed to monitor under Rule 1200-5-1-.05(11) and 1200-5-1-.06(3) must monitor at a representative entry point at least once per day. Turbidity cannot exceed a monthly average of 1 NTU or an average of 2 NTUs for 2 consecutive days. Systems directed to monitor must submit monthly turbidity data on the Monthly Operations Report (MOR).

All Subpart H ground water systems under the direct influence of surface water and meeting the criteria for avoiding filtration must comply with the 5 NTU maximum (no single sample can exceed this value). Systems avoiding filtration are subject to an annual on-site inspection to assess their wellhead protection program and by September 30 of each year provide to the State a report describing its watershed control program. (Refer to Rule 1200-5-1-.31(2) and 1200-5-1-.31(6)(a)3 and 4 for details.) Systems must submit monthly turbidity data on the MOR and the Filter Performance Report. Systems must monitor turbidity every four hours (or more frequently) that the system produces water. If approved by the Division the system may substitute continuous turbidity monitoring for grab sample monitoring. The system must report the maximum turbidity

level measured each day during the month, date(s) of occurrence of values exceeding 5 NTU, and the cumulative number of events turbidity exceeded 5 NTU in the previous 12 months and previous 120 months. (Refer to Rule 1200-5-1-.31(2)(c).

Ground water systems under the direct influence of surface water and required to install filters but as of yet do not have them are required to monitor turbidity once every four hours. If more than one value is obtained every four hours the highest value must be reported. Turbidity compliance for public water systems with a ground water source under the direct influence of surface water (Rule 1200-5-1-.08 and 1200-5-1-.31 apply to systems with sources that are ground water and under the influence of surface water) is determined from data submitted on the Monthly Operation Report (MOR) and Filter Performance Report. Turbidity summary sheets must be received in the Nashville Central Office by the 10th of the following month. Likewise MORs must be received in the Field Office by the 10th of the month. Laboratories performing the turbidity analysis must be "approved" by the DWS. All CWSs with ground water supplies serving 50 connections or 150 individuals except those in approved sand and gravel formations or those with a waiver are required to have an in-line turbidimeter with recorder and automatic shut-off capability (1200-5-1-.05(11).

Systems With Filtration or Alternative Technology

All systems that filter or use alternative filtration technology must submit monthly turbidity and chlorine residual data on the MOR (Rules 1200-5-1-.17(2), 1200-5-1-.29(2) and 1200-5-1-.31(6)(b)) and the Filter Performance Report (CN-1200). All public water systems using surface water and ground water systems under the direct influence of surface water that filter (except those utilizing absolute 1.0 micron cartridge filters) should perform a rewash cycle, or filter-to-waste each time a filter is back-washed unless an alternative has been approved. Systems must backwash a filter to prevent the individual filter from exceeding the MCL. Systems must also filter-to-waste or take other corrective action until such time as filter effluent meets turbidity standards (i.e. filtering-to-waste while monitoring the individual filter turbidimeter until water meets the acceptable turbidity level). Finally, all Subpart H systems must have a watershed control program (see Rule 1200-5-1-.31(1)(e).

Subpart H systems with conventional, diatomaceous earth, direct filtration or membrane filtration are required to monitor combined filter effluent and individual filter effluent turbidity continuously when the plant is treating water. The highest C.F.E. turbidity value obtained in each four-hour period must be reported. Systems with slow sand filtration or filtration treatment other than conventional treatment and systems serving fewer than 500 persons regardless of the type of filtration used (except membrane filtration) may reduce the sampling frequency to one per day if less frequent monitoring is sufficient to indicate effective filtration performance.

For **Subpart H systems**, the Safe Drinking Water Information System (SDWIS) verifies system adherence to the 1 (i.e. 1.49) NTU maximum (combined filter effluent) and a maximum of 0.3 NTU in 95 percent of all combined filter effluent samples collected each month. Also, systems must monitor individual filters using continuous monitoring recorders. Individual filter turbidity levels cannot exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart; nor can individual filters exceed 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous operation after a filter has been backwashed or otherwise taken offline; nor can individual filter turbidity levels exceed 1.0 NTU in two consecutive measurements taken 15 minutes apart in three consecutive months; nor can individual filters exceed 2.0 NTU in two consecutive measurements 15 minutes apart in two consecutive months. If an individual filter exceeds any of the above limits, a filter profile must be conducted or an obvious reason for the exceedance must be reported, and a filter exceedance report to the state

is required. A turbidity level above 2.0 NTU requires a comprehensive performance evaluation (CPE) to be performed by the State or a third party approved by the State.

NCWSs using cartridge filters (considered "Point of Entry" or alternative technology systems) must replace cartridge filters when filter effluents approach 1.0 NTU: DWS guidance (Jan 2000) categorizes NCWSs using absolute 1.0-micron cartridge filter systems as Point of Entry (POE) systems. Effective January 1, 2005 these systems were to monitor turbidity each day water is treated and monitor chlorine residual each day water is served (Rule 1200-5-1-.31(6)(b), 1200-5-1-.29(2) and 1200-5-1-.17(2)). Systems which have difficulty complying with the 1.0 NTU turbidity limit (in 95 percent of all samples) must consider more frequent monitoring and/or other treatment options. At no time can the water exceed 5.0 NTU. (See Rule 1200-5-1-.31(4)(b).)

(G) Disinfection/Disinfection By-Products Compliance

Disinfection compliance is generally determined using SDWIS data submitted on the Disinfection Summary Form and the Monthly Operation Report. Systems are required to determine and report a chlorine residual with each bacteriological sample collected. Surface water and ground water under the influence systems are required to monitor chlorine continuously unless they meet certain population requirements (i.e. they serve less than 3300 people) that could qualify them for less than continuous monitoring.

In addition, Subpart H public water systems must monitor for HAA5 and THMs. If HAA5 or TTHM results are above 0.048 mg/L and 0.064 mg/L respectively, the system must have a disinfection profile to comply with the disinfection and filtration rule. Disinfection profiles shall be reviewed during the Sanitary Survey. Systems must conduct disinfection profiling unless THM and HAA5 results are less than or equal to 0.064 mg/L for total trihalomethanes or 0.048 mg/L for total haloacetic acids annual arithmetic average based on four quarters of data. (Refer to Rule 1200-5-1-.31(8) and .36(2) for additional details.).

Stage 1 Disinfection By-Products monitoring must be conducted by all Community and Non-transient Non-Community water systems which add a chemical disinfectant to the water or which provide water that contains a chemical disinfectant. Each system required to monitor must develop and implement a monitoring plan. Systems greater than 3,300 population must submit a copy of the monitoring plan to the State. At least 25% of all samples collected must be taken at locations that represent the maximum residence time of the water in the distribution system. Systems must meet MCLs for disinfection byproducts and MRDLs for disinfectants. Systems must also monitor for disinfection byproduct precursors (TOC) by collecting paired samples of source and treated water. Systems must meet treatment technique requirements for disinfection byproduct precursors.

The sanitary survey should also review whether a parent water system takes into account the distribution system of any consecutive system served when determining the maximum residual contact time sample and sampling sites (Stage 1 D/DBP). This information should be documented in the system's monitoring plan.

Consecutive systems that are a part of a Subpart H system complex that purchase water from more than one system are required to establish an individual monitoring plan and sample for TTHMs and HAA5. The number of samples required for the consecutive system will be based on the population served by the consecutive system in accordance with the regulations.

For Stage 2 Disinfection/Disinfection Byproducts, all Community Water Systems that use disinfectants or delivers water that has been treated with a disinfectant must conduct an Initial

Distribution System Evaluation (IDSE) unless the system meets the 40/30 certification criteria or is granted a very small system waiver of the IDSE. Non-transient non-community water systems that serve at least 10,000 people and add a chemical disinfectant are also subject to this requirement. Systems that must conduct IDSE must develop a standard monitoring plan and submit such plan to the Division.

(H) **Chemical Analyses**

The next major area for review should be chemical analysis. The files should be checked to see if analyses were performed according to the **Standard Monitoring Framework** sampling frequency or waivers issued as required by rules. All monitoring must have been by a state certified laboratory and results submitted within 10 days of analysis or compliance period per 1200-5-1-.14(5)(e). Results should be reviewed to insure that a violation of any of the standards has been noted and the system is meeting sampling requirements. Included in the chemical parameters are the chemical groups consisting of **inorganics** (including fluoride and arsenic), **synthetic organic chemicals** (regulated and unregulated), **volatile organic chemicals** (regulated and unregulated), **radionuclides** (including uranium), **sodium**, **disinfection by-products** and **lead** and **copper**. **Radon** and other chemicals must also be checked after rules are adopted which require monitoring for them. Currently, there is no unregulated SOC monitoring required for systems under 10,000 people unless specifically designated by the Environmental Protection Agency (EPA).

(I) **Public Notification**

Inspectors must review public notification(s) provided by a public water system on file with the Division. Acute violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure require a "Tier 1" public notice and require an immediate notice be given to customers. Acute violations include exceeding the MCL for fecal coliform, e-coli, enterococci, nitrate, chlorine dioxide, a treatment technique requirement or turbidity MCL where the department determines a Tier 1 notice is required or a disease outbreak has occurred. Turbidity and treatment technique requirement violations may also be considered Tier 1 violations where the Department is not consulted within 24 hours. The Notice must be calculated to reach all persons served by the system and given to consumers within 24 hours of the system learning of the violation. Systems may use the broadcast media, posting, hand delivery or other method approved by the Department. A significant deduction in score is warranted where a system has chosen not to issue a "Tier 1" Notice.

Non-acute violations and situations with potential to have serious adverse effects on human health require that CWSs and NTNCWSs provide Tier 2 public notice by direct mail notice to each customer in addition to providing notice to persons that would otherwise not receive a mailing. Non-acute violations include MCL, some MRDL, turbidity and treatment technique requirement violations. The notice requirement to individuals not receiving direct mail can be met by radio announcements, posting entrances to factories and apartments and/or providing newspaper announcements. Tier 2 public notices are to be given within 30 days after the system learns of the violation by direct mail to each customer.

Violations and situations not requiring Tier 1 or Tier 2 public notice are categorized as "Tier 3." Tier 3 public notice must be provided for monitoring violations, failure to comply with a testing procedure, failure to provide monitoring results as required, etc. The Notice must be calculated to reach all persons served by the system. Tier 3 public notice is to be given by mail or other direct delivery to each customer receiving a bill within one year after the system learns of the violation. CWSs may use the Consumer Confidence Report (CCR) to accomplish direct delivery of a Tier 3 public notice if the violation and other required language is included. CWSs may use any method

calculated to reach other persons served by the system, including local newspaper, postings, newsletter and e-mail.

The water system is required to provide the Division with a copy of the notification given to the public within 10 days after publication. System files should contain a copy of any required notification. See Rule 1200-5-1-.19 for details relative to public notification requirements.

(J) **Consumer Confidence Reports (CCRs)**

System Category

CWS

Inspectors must review CCRs on file with the Division. In 1998, EPA promulgated the Consumer Confidence Report Rule requiring community water systems to issue annual water quality reports to their customers. CCRs are due each year by July 1. CCRs provide a snapshot of water quality over the preceding calendar year. The reports must include information on levels of detected contaminants and if the system has violated an MCL or a treatment technique or had monitoring violations. The report must also include information on the potential health effects of contaminants.

CWSs must provide an annual CCR in a timely manner. CCR data must be given to consecutive systems by April 1 annually unless an alternative date has been mutually agreed upon. CCR reports have to be delivered to customers and the State by July 1 each year. Any contaminant listed in Appendix A of 1200-5-1-.35 must be listed in the CCR if detected. Details concerning the Consumer Confidence Report can be found in Rule 1200-5-1-.35.

(K) **Operator Certification**

The inspector should check to see that the system currently meets the requirements of operator certification under the Water Environmental Health Act (WEHA). (See TCA 68-221-904, Rule 1200-5-3 and Rule 1200-5-1-.17(1).) The act requires all public water systems (meeting the Tennessee SDWA definition of CWS and NCWS) to have a certified operator in direct charge. Excluded from the requirement are transient non-community water systems which do not serve water 60 consecutive days or 120 days during the year.

Water and Wastewater Certification regulations adopted July 5, 1998 by the Operator Certification Board classify water treatment systems and distribution systems according to the level of certification required. The rating value points are given in the Water and Wastewater Operator Certification Rules. The inspector should be prepared to compare listed treatment processes with what the system has in-place on the day of the inspection. Placing into service facilities and treatment processes which have not been approved merit enforcement.

System compliance with operator certification requirements can be determined by checking the printout of certified operators (distributed quarterly by the data management section of the DWS). Printouts are sorted by facility and by operator name. Water systems are required to notify the Certification Board in writing of the loss of certified operators so that the DWS can identify those facilities with and without a certified operator. The Certification Board has authorized the DWS to

receive the notification on behalf of the Board. Inspectors should also verify the accuracy of the information during the inspection.

Note that the Water Environmental Health Act (WEHA) requires all public water systems that serve water at least 120 days or 60 consecutive days out of the year to have the person in direct charge to be certified. Persons in direct charge shall mean the person or persons, expressly designated to be in direct charge and named in writing to the certification board and the Division of Water Supply by the water supply system. All operating personnel making process control/system integrity decisions about quality or quantity that affect public health must be certified. A designated certified operator must be available for each operating shift depending on system size, complexity and source water quality. The person in direct charge of the treatment facility and distribution system must have the appropriate certification in accordance with the classification system of the Board of Certification. The state must be notified when an operator is designated as "in direct charge."

Standard Operating Procedures (SOPs): The inspector conducting the Sanitary Survey should also review whether the water system meets the requirements of the EPA as to the "availability" of a certified operator in direct charge. To comply with the requirements the DWS issued Guidance regarding "availability" on September 19, 2007, and to public water systems on Preparing Standard Operating Procedures (SOPs) on November 8, 2001. Tennessee now requires all operating personnel making process control/system integrity decisions about water quality or quantity that affects public health be certified.

To comply with state and federal laws and policies, public water systems shall retain a certified operator on site during each shift the plant operates or prepare standard operation policies and procedures in accordance to Division Guidance issued September 19, 2007. Further, the operator in direct charge should have written policies in place to protect him from enforcement action should his policies not be followed by an operator running the plant in the certified operator in direct charge's absence.

The SOP should list the specific tasks and responsibilities of the operator in direct charge of the plant and distribution system, shift operators and other operating staff having the basic skills, judgment, and care needed to operate a treatment plant in the manner in which it is capable for the production of drinking water. To be effective and to demonstrate availability of the certified operator, SOPs must be specific with respect to the duties of operating personnel.

(L) Cross Connection Plan and Program

System Category
CWS

All community water systems are required to have an approved ordinance or policy and plan prohibiting cross connections as well as have an active on-going program to detect and eliminate cross connections as approved by the Division (See Rule 1200-5-1-.17(6)). Additionally, a copy of the approved cross connection ordinances/policies and plans should be contained in the Field Office files. Inspectors should determine if documents are on file and the adequacy of such documents.

The cross connection plan should specify how it will identify potential cross connections and detail a plan of annual inspections and testing of back-flow prevention devices. The plan must specifically require that individuals who test devices be individuals who have demonstrated proficiency satisfactory to the State (individuals with a plumber's certificate are not acceptable testers). The cross connection plan may include educational materials available for distribution and use. Water systems should review cross connection plans, their education efforts and inspection programs and periodically update their materials and program.

(M) **Emergency Operations Plan (EOP) and Distribution Map**

System Category

CWS

Inspectors should review the EOP on file for the system. Every community water system is required to have an Emergency Operations Plan (EOP) to safeguard the water supply and alert the public of unsafe drinking water (See Rules 1200-5-1-.17(7) and 1200-5-1-.16(1). The Emergency Operations Plan should be formulated after an assessment of how an emergency would affect the system's resources such as water source, treatment facilities, distribution system, and employees. The Emergency Operations Plan addresses such issues as communication procedures, location of supplies, equipment location and availability, mutual aid availability such as suppliers, contractors, other water systems, etc., and water use priorities following the emergency. Plans should be checked to see that they are accurate and up to date. The plan should follow DWS guidance. The distribution map, for systems with greater than 50 service connections, should also be up to-date. General distribution system maps must be submitted to the Division every 5 years. Determine if the distribution map has been updated and if the EOP reflects these situations. Any significant changes should be submitted in an update, addendum or insert to the Emergency Operations Plan (EOP). This plan should be reviewed and updated every two years or every time there is a change in system configuration or chain of command.

(N) **Source Water Protection**

CWS	NTNCWS

Inspectors must review the wellhead protection plant or source water protection plan. All public water systems using a ground water source shall prepare a Wellhead Protection Plan (WHP) which determines a wellhead protection area and identifies all potential sources of contaminants (septic tanks, underground fuel storage tanks, cemeteries, sinkholes, abandoned wells, etc.) which may have an adverse effect on the health of persons and potential contaminant sources within the area. A Wellhead Protection Plan must be available for review during the survey. Each ground water system will be required to have a Wellhead Protection (WHP) plan according to the categories listed in Rule 1200-5-1-.34(1)(e). Wellhead Protection Plans are revised every three years or when changes warrant.

Public water systems which use a surface water source must prepare and annually update a contaminant source inventory of significant potential contaminant sources which may have an adverse effect on the health of persons within the source water protection area. The contaminant source inventory must be available for review during the survey and must be submitted to the Department every three years.

Public Water Systems avoiding filtration are subject to an annual on-site inspection to assess their wellhead protection program and by September 30 of each year provide to the State a report describing its watershed control program. (Refer to Rule 1200-5-1-.31(2) and 1200-5-1-.31(6)(a)3 and 4 for details.)

(O) **Fluoridation**

System Category
CWS

The inspector should check some additional items for those systems which fluoridate. Fluoridated systems are required to submit quarterly check samples to a State certified laboratory to insure the accuracy of local monitoring. A printout is distributed quarterly containing the results of the check samples as well as results from any random fluoride samples taken by Division personnel. Systems must monitor according to their Drinking Water Monitoring Program (DWMP). Monthly Operating Reports (MORs) can be checked to see that proper monitoring is performed, quantity of chemical fed is recorded, and dosage is calculated and recorded. This should be done daily. If questions arise concerning the status of fluoridation for a system or the need to assess penalty points, the inspector is encouraged to contact the Division's fluoridation personnel located in the Nashville Environmental Field Office.

(P) **Monthly Operation Reports (MORs)**

System Category	
CWS	NTNCWS

All community water systems **and** non-community water systems with a "surface source" are required to submit Monthly Operating Reports (MORs) to their respective Field Office. (See Rules 1200-5-1-.17(2) and 1200-5-1-.31(6)(b).) Distribution systems must list daily the amount of water purchased, daily chlorine residual, and location of bacteriological sampling. Systems producing their own water must report the parameters listed on their Drinking Water Monitoring Program (DWMP) at the frequency indicated in their monitoring schedule. Operators should utilize standard methods when conducting tests. Systems should report the amount of each chemical fed (without regard to concentration or purity) and the calculated dosage along with information on concentration, etc. The inspector should check to see if all MORs have been submitted and received on time (by the tenth of the following month). The inspector should take the MORs from the twelve month period preceding the survey and calculate the average daily demand and find the maximum daily demand for water. Missing data, and unrealistic patterns of data should be noted and their cause ascertained. Computer generated monthly operation forms may be

submitted with prior approval by the Field Office. Inspectors should make sure the operational tests include sufficient "in process," or "unit performances" tests. If sufficient tests are not being done, they should be specified in the monitoring program.

Penalties may be assessed for violations of secondary standards (Rule 1200-5-1-.12) which are reported on Monthly Operating Reports (MORs). These should be taken into consideration if there have been complaints that can be attributed to the violation.

If the DWMP needs updating then this should be done by the inspector at the time of the survey using the criteria developed by the Division.

(Q) **Corrosion control**

All CWSs and NTNCWs must minimize lead and copper concentrations at the user's tap. See the definition of "Optimal Corrosion Control Treatment" (OCCTP) in Rule 1200-5-1-.04 and general requirements in .33(1)(a) and (d). All water systems serving greater than 50,000 people shall have demonstrated an OCCTP and must continue to provide an optimal corrosion control treatment program in order to maintain levels of corrosion in their distribution system. MORs and bench sheets should verify that the treatment program continues to be followed as approved. Any changes in treatment processes should be verified during sanitary surveys and an evaluation performed regarding how such changes do or may affect lead and copper concentrations.

(R) **Bacteriological Sampling Site Plan**

Inspectors must review the adequacy of the water system's bacteriological sampling plan and identify if sites are monitored which are representative of water throughout the distribution system and insure that no portion of the distribution system has been neglected (See Rule 1200-5-1-.07). The plan insures that bacteriological samples are collected at sites that are representative of the water throughout the distribution system, including dead-end lines, low use areas, residential areas, and near storage tanks.

The sampling plan should include division and laboratory contact information, number of and schedule for samples to be taken each month, a sampling log and information on record keeping, sampling procedures, timeframes and actions to be taken in response to total positive and fecal positive samples, etc.

(S) **Flushing Program**

Inspectors must review the Flushing Program if on file at the Environmental Field Office. Community water systems greater than 50 service connections must have a flushing program to address potential biofilm growth, HAA5 and TTHM formation, sediment, air, taste and odor problems and low disinfectant residuals (See Rule 1200-5-1-.17(10) and (23). Actual flushing records (containing information on the date, time, location, chlorine residual, etc.) are to be reviewed during the on-site inspection. In addition, sites with air relief valves, blow-offs and other needed equipment should be identified so they can be verified as properly maintained. If a system's records show chlorine residuals below 0.2 mg/l they should be instructed to revise their flushing plan in order to maintain adequate residuals.

(T) **Capacity Development Plan**

Inspectors should review the Capacity Development Plan if on file with the Division or note the necessity of a Capacity Development Plan. All public water systems are subject to the Capacity Development Plan Requirement. Subsequent to October 1, 1999, all new CWSs and NTNCWSs must have a Capacity Development Plan and be a viable system. Existing water systems identified as not complying or potentially not complying (see Capacity Development Strategy) must prepare a Capacity Development Plan. A Capacity Development Plan includes information concerning organizational structure, fiscal management and controls, staffing and a Business Plan identifying sources of income and costs related to operating a water system.

(U) Filter Backwash Recycling

Source	
Surface Water	Ground Water Under the Influence of Surface Water (Filtration)

Systems that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes, had to notify the State by December 8, 2003 in writing that they practice recycling. This notification had to include the following:

1. A plant schematic showing the origin of all recycle streams including the hydraulic conveyance used to transport the recycled flows and the location where they are recycled back into the plant;

2. The typical recycle flow (in gpm);

3. The highest observed plant flow experienced in the previous year (in gpm);

4. The water treatment plant design flow (in gpm); and

5. The State approved operating capacity for the plant (if the State has made that determination).

All systems must be checked to determine if they recycle filter backwash water.

II. Conducting the Inspection

(A) Records Investigation

The inspection should probably begin at the office of the water system. This allows Division staff to identify their presence and announce the intent to perform a sanitary survey. In addition, this is an appropriate location to verify/obtain property owner information, and it is a good time to verify data and the classification of the system. Under the Safe Drinking Water program the property owner is clearly the responsible party, whether it is a municipality, corporation, or individual owner who is leasing a facility to a business operator. Though a tenant may have an agreement whereby the tenant pays various taxes, fees and operates the facility, the property owner is ultimately responsible for the system. It is acceptable for the tenant to operate the water system, but the system owner (property owner) is the "supplier of water" under the act. In addition, it is imperative to verify/obtain information regarding those who manage and operate the public water

system, including certified operators, those in direct charge, current mailing addresses, phone numbers, location data, etc. Any documents required by the DWS (cross connections policy, operator agreements, source water protection plans, etc.) must be signed by the owner, registered agent, or other individuals with the clear legal authority to represent the owner. The system data sheet can be modified at this time incorporating any changes that may have occurred since the last inspection.

Circumstances which may warrant advance notice prior to conducting the inspection include water systems which are likely to be closed to inspectors should the inspection be unannounced.

The office will likely be the location where some files are kept. Other records may be maintained at the water treatment plant and/or distribution facilities. The inspector should determine the location of the records needed for review and check to see that the system has maintained adequate records. The following records are required to be maintained and available for review for the specified period of time.

Microbiological results (Including line repair samples)	5 years
Chemical Analyses	10 years
Chemical Monitoring Waivers	10 years
Lead and Copper (including documentation)	12 years
Sanitary Surveys or other reports	10 years
Action taken regarding violations	3 years
Public Notification	3 Years
Notification of Construction	survey to survey
Flushing Records	survey to survey
New Tap Records	survey to survey
Turbidity results (combined and filter effluent)	5 years
Individual Filter turbidity records	5 years
Records of variance and exemption	5 years
Daily worksheet, shift logs and MORs	5 years
Cross connection records	5 years
Complaint Logs	5 years
Maintenance and Service Records (Including repairs of vandalism, break-ins, and system flushing)	5 years
Storage tank inspections	5 years
Consumer Confidence Reports	3 years
Equipment Calibration Records	5 years
Disinfection Profiles	10 years
Filter Profiles	10 years
Filter Backwash Recycle Information	10 years
Corrective Action Documentation (G.W.)	10 years
Special Notice – Significant Deficiencies	3 years
Record of Decisions or Invalidation	5 years
Notification to Wholesale System	5 years
Dept. Specified Minimum Disinfectant Residual	10 years
Daily Residual Disinfectant Concentration Records	5 years
Dept. Specified Membrane Filtration Records	5 years

The system must also maintain records involving public notification resulting from violating the primary drinking water requirements.

Records from the system's ongoing cross connection program must be available to inspectors. Documentation should be available regarding cross connection surveys (number of inspections, dates, locations, and other details, etc.), re-surveys, enforcement, and testing.

Records must be available for routine flushing in the distribution system. Flushing records should detail location, date, employee, and ending free chlorine residual on the end of dead end mains after flushing.

The map of the distribution system (showing lines and line sizes) must be made available to DWS personnel. A continuously updated overall map with addendum or inserts, etc. must be submitted to the Division every five years.

Where gaps in data exist, maintenance records of equipment should show dates "out-of-service," etc. and indicate cause of failure, as well as when calibrations and/or repairs were made. All turbidity analysis equipment used for compliance purposes must be calibrated in accordance with manufacturer's recommendations.

Inspectors should review current daily work sheets, instrument scales, etc. They should be labeled to show current time and date for which data is being collected (and not the "shift" date). Inspectors should also review and compare previously submitted records (MORs, and Summary Data) with recorded turbidity and chlorine chart data, daily work logs, etc. Previously submitted MORs and other reports should compare and be consistent with system strip charts, daily worksheets, etc. The strip charts must be labeled with date, time, place, operating scale for each day and operator initials. Spikes in turbidity, omissions in data, discrepancies and anomalies should be documented and/or investigated. All records should be available at the time of the survey. If the system has had a change in certified operators since the last survey, verify that the system has documentation that the Operator Certification Board has been notified.

Every public water system must certify annually, in writing, when acrylamide and epichlorohydrin (polymers) are used in drinking water, that the product does not exceed the level established in Rule 1200-5-1-.17(31). Confirm whether the system is using chemical compounds acrylamide and epichlorohydrin.

Verify that pounds of chemicals fed (gross product) are accurate (with no purity rates taken into account) and do not reflect a "calculation." Verify that chemicals (chlorine, alum, polymers, pump lubricants, etc.) fed are National Sanitation Foundation (NSF) approved, where applicable.

Water system personnel at the office should be able to provide the number of connections served by the system. They should have details about the number and grade level of certified operators in the system, both plant and distribution. Finally, copies of the Bacteriological Sampling Site Plan, Emergency Operations Plan (EOP), Wellhead Protection Plan and/or Source Water Protection Assessment (if made) should be available for inspection. Personnel should be familiar with the plans should implementation be required.

(B) **Source and Facility Inspection**

Source

Surface Water	True Ground Water (no filter)	True Ground Water (Iron/Manganese Filter Removal)	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)

The second phase of the on-site inspection involves a source inspection, in addition to the treatment facility. All sources (wellheads, intakes, springs, etc.) must be inspected. The inspector should compare the source(s) with the submitted wellhead protection plan or source water assessment (whichever is applicable). Aspects to be considered during the inspection include evaluating the source, operation and maintenance of the physical treatment facility, whether or not the facility is capable of meeting accepted water quality standards, whether or not the facility has met all water quality monitoring and sampling requirements, and whether results from water quality monitoring were within acceptable levels. The inspector should observe filters during a run to check efficiency. Inspector(s) should also observe a filter backwash cycle. Inspectors should also evaluate the system's laboratory, laboratory procedures and monitoring program. Inspectors must observe the performance of laboratory tests during the survey. Inspectors must observe calibration techniques for turbidimeters to approve systems for turbidity analysis and calibration.

Source

Surface Water	Ground Water Under the Influence of Surface Water (Avoiding Filtration)	Ground Water Under the Influence of Surface Water (Filtration)

Subpart H systems are required to monitor combined filter effluent turbidity continuously while the plant is in operation unless otherwise approved by the State. The value may be obtained by one of the following:

1. Systems which take one sample every four hours are to report the value of that sample.

2. Systems which take more than one sample every four hours are to report the **highest value** obtained.

3. Systems which continuously monitor combined filter effluent turbidity must report the highest value obtained from the strip chart during each four hour period. Continuous monitoring equipment having automatic shut-offs and alarms should be tested to verify shut-off and alarm capability.

Turbidity monitoring frequency and limits should be specified and clearly on file for systems using point of entry or alternative technology (See Rule 1200-5-1-.29(2) and/or 1200-5-1-.31(5)(c)1.)

(C) Distribution System Inspection

The next phase of the on-site inspection should be an evaluation of the distribution system. The function of the distribution system is to provide an adequate supply of water to all customers while maintaining finished water quality.

The inspector(s) must inspect pump stations, reservoirs and distribution tanks looking for items which could affect the quantity or quality of water provided. Hand held pressure gauges may be used to check the static pressure at individual homes or businesses. One or more sites near dead ends should be selected for sampling chlorine residual. Before a system can be penalized for lack of chlorine, samples must be taken from the distribution system. System personnel should be questioned about regular sampling locations for chlorine residual and bacteriological

analysis. Tanks which have been valved-off should be identified. Inspectors should also evaluate tank usage to determine if tanks are operated together or as separate parts and if bacteriological samples are taken to reflect usage. Professional tank inspection reports must be reviewed and the condition of the tank(s) noted.

Distribution personnel should be questioned about flushing procedures and locations. Records of routine flushing activities must be reviewed. The map(s) of the system must be observed with attention given to locations without appropriate flushing appurtenances. Dead ends and low points must be equipped with a suitable flushing mechanism.

Line repair records must be reviewed together with bacteriological sample results collected to document line disinfection procedures. New facilities projects must be reviewed and records must show lines disinfected, flushed and bacteriological sample results. Supplies should be available for disinfecting new lines and reservoirs as well as emergency repairs.

The inspector must review customer complaints when evaluating the distribution system and associated records. For the purpose of the sanitary survey, customer complaints reviewed should be relative to water quality or water quantity issues.

The inspector should talk to those responsible for the cross connection program. The inspector should have an idea of the complexity of the distribution system, i.e. the number of commercial, industrial, and institutional customers and customers with wells, irrigation systems and swimming pools in order to make an evaluation of the on-going program. Consideration should be given to the level of documentation, number of surveys and re-surveys, degree of enforcement, and frequency of testing. All testable devices must be tested annually.

(D) **Discussion of Results**

The last phase of work is meeting with water system managers to discuss obvious findings or deficiencies identified during the records review, and/or the inspection. This should be done prior to the final rating has been determined due to more than one inspector being involved with the inspection. This meeting is particularly important if significant or major deficiencies are found or if the inspector knows that a change in rating categories is certain. The inspector should attempt to meet with the system manager or highest level official available, preferably one who is responsible for making decisions regarding the overall operation of the system. They should discuss identified deficiencies and possibly those recommendations necessary for improvement. If the system is a persistent violator then the inspector should explain that the sanitary survey letter may include a Notice of Non-Compliance (NONC) and schedule a Compliance Review Meeting (CRM) to address the violations. A suggested compliance timeframe for violations should be discussed along with the fact that the letter could contain a compliance schedule. If the inspector knows for certain that a change of status will occur the system official should be informed of any possible change of status. If not discussed at the conclusion of the inspection the inspector or inspection team may choose to schedule a meeting with the water system manager, city manager, mayor, commissioner, owner, etc. at a later date to discuss findings. When a drop in status is about to occur a discussion with the highest level system official deemed appropriate (mayor or president of a utility district) should be held before the final sanitary survey letter is sent.

III. Documenting the Inspection

The final step of conducting a sanitary survey is to provide written documentation of the results. Items to be completed in this portion include a letter to the system detailing the findings of the on-site inspection, updating the water system's data sheet, completing the rating sheet, and submitting an SDWIS turnaround document to the Nashville Central Office. Persistent violators

will require a compliance schedule be drafted and a CRM scheduled. This must be completed within **two weeks** of the final field visit.

(A) **Survey Rating**

The inspector must complete the rating sheet assessing penalty points according to the "Guidance for Evaluating A Public Water Supply System." Questions concerning the applicability of a penalty assessment may be directed to the Environmental Field Office program manager or Quality Assurance Program Manager. Completion of the rating sheet should place the system into one of three categories based on the score.

Category	Rating
Approved	95% -100%
Provisionally Approved	90% - 94%
Unsatisfactory	0 - 89%

If it appears that a system will change classification by moving into or out of the "Approved" category, then the inspector must discuss the rating with the Environmental Field Office program manager. If the classification change is for a large community water system or is potentially controversial, the Director of the Division of Water Supply should be notified. It is at the discretion of the Environmental Field Office program manager to date and mail the survey letter to the system and make copies for the Nashville Central Office or send the undated survey letter to the Nashville Central Office for review, dating, and mailing to the system. No survey letter and results of an inspection is to be mailed to any system that obtains a lower classification from the previous year until the results of the survey have been discussed with the highest responsible official.

A water system may request that a re-inspection be conducted by Division staff subsequent to correction of deficiencies identified during a sanitary survey. Such re-inspections shall address items documented during the performance of a sanitary survey, shall be restricted to deficiencies that can be corrected and shall not constitute a new sanitary survey. Re-inspections must be requested in writing by the water system within 45 days of the completion of the sanitary survey. Upon the effective date of 2008 Rule revisions, re-inspection fees shall be charged to recover costs associated with this service and shall be in accordance with Division Rule 1200-5-1-.32 as amended. Applicable fees must be received by the Department prior to the re-inspection occurring. Re-inspections shall be scheduled and performed within 30 days of receipt of fee payment. Subsequent to a re-inspection, the sanitary survey rating and score may be amended to document corrections observed during the re-inspection process.

(B) **Bacteriological Sampling**

Following completion of the rating sheet, the inspector must update the system data sheet with any changes that may have occurred since the last inspection. The number of water system connections is multiplied by the County Household Population Factor (most recent available census data) to obtain the population served by the system. This value can be compared to the values listed in Rule 1200-5-1-.07(1)(c) to determine if the system needs to increase its bacteriological sampling rate. The population figures supplied by the water system may be substituted for the County Household Population Factor if the value has adequate documentation. The system must be notified in the survey letter if the bacteriological sampling rate has changed. The state laboratory (Department of Health Services) shall be notified of an increase or decrease in bacteriological sampling.

(C) **SDWIS Turn-Around Document (TAD)**

A computer turnaround document must be updated for each sanitary survey so that the information may be incorporated into the SDWIS system. Turn-around documents (TAD) are usually available for each system within an Environmental Field Office. If one is not available, contact the DWS' Data Management Section. As much information as possible should be included on the TAD including all persons listed on the data sheet, plant phone numbers, e-mail addresses, etc.

(D) **Survey Letter**

Results of the inspection shall be transmitted to the water system through a letter sent to the highest responsible official or owner. Other system personnel such as the Certified Operator in direct charge, superintendent or operator(s) should be sent a copy of the letter. The inspector should also send a copy of the letter to the regional and county health offices. **All survey letters must be sent to the water system no later than thirty (30) days after completion of the sanitary survey.** When writing the survey letter, write to the intended audience, the letter should not contain unnecessary technical language as the management officials may not be versed in the operation of a water system. Comments and recommendations should be clearly explained including the purpose for requested action when applicable. ***The letter to the system must clearly list system deficiencies and request that system officials and management respond to the State in writing within 45 days as to how and when significant, water quality or water quantity deficiencies will be addressed and if a re-inspection is desired. Ground Water systems must consult with the Department within 30 days of written notice of significant deficiencies unless the Department directs implementation of specific corrective actions.*** The body of the letter should contain the name of the inspector to avoid confusion when the letter contains the manager's original signature.

General specifications as to acceptable font, margins, point sizes, etc. for the survey letter are given in Appendix 1.

(E) **Documentation Package**

A documentation package should be assembled within **two weeks** after performing the on-site inspection. It must include a copy of the Sanitary Survey Letter, Rating Form, and original Data Sheet, SDWIS Turn-Around Document, Field Sheet. All documentation must be included when the copy is sent to the Nashville Central Office. If the population has increased to the point where additional bacteriological sampling is required by a system not performing its own analysis a notice must be sent to the Division of Laboratory Services so that the proper number of bottles may be sent to the system. If the Sanitary Survey Letter is classified as a notice of non-compliance, then a copy must to be sent to the DWS' Enforcement Coordinator.

The following table shows who is to be sent documentation regarding the survey and which portions they are to receive.

	Documentation Package					
Recipient	Survey Letter	Rating Form	Data Sheet	SDWIS Turn-Doc	Field Sheet	TDOT Letter
System Official/Owner	Original	Original	copy	n/a	n/a	n/a
Certified Operator (In-direct Charge)	copy	copy	copy	n/a	n/a	n/a

Regional Health Ofc	copy	copy	n/a	n/a	n/a	n/a
County Health Ofc	copy	copy	n/a	n/a	n/a	n/a
DWS Field Office	copy	copy	copy	n/a	copy	copy
DWS NCO	copy	copy	Original	Original	Original	Original

(F) **Compliance Schedules**

The following is a list of suggested time schedules for achieving compliance.

Compliance Item	Time for Compliance
Microbiological monitoring	30 days
Microbiological MCL	45 days
Disinfection Profile	30 days
Filter Profile	30 days
Disinfection required (50 connections)	45 days
Turbidity monitoring - surface supply	30 days
Turbidity monitoring - ground water	90 days
Turbidity MCL - surface	
(a) facilities functional	30 days
(b) facilities need upgrading or repair incl individual filter turbidimeters	90-180 days
(c) Comprehensive performance evaluation (CPE)	90-180 days
Turbidity MCL - ground water	360 days
Cross Connection Program	
(a) submittal of adopted policy or ordinance	30 days
(b) submittal of plan	45 days
Certified operator	30 days
Emergency Operations Plan (EOP)	60 days
Wellhead Protection Plan	60 days
Public Notices	30 days
Capacity Development Plan	60 days
Equipment Maintenance Records	30 days
Customer Complaint Log	30 days
Organizational Chart and Job Descriptions	45 days
Low Pressure	45 days

It may be assumed that a system has made a valid effort to come into compliance if it has achieved the following:

1. Submitted required microbiological samples.
2. Submitted samples to a certified laboratory for chemical analysis within 30 days.
3. Submitted cross connection ordinance or policy.
4. Hired a certified operator
5. Given Public Notification

Guidance for Rating a Public Water Supply System

The following guidance is to be used by the staff of the Division of Water Supply while conducting on-site evaluations (sanitary surveys) of Public Water Systems (PWSs). The sanitary survey evaluation is comprised of eight major rating sections. The rating points assigned to each of the eight sections are the total number of points available in that section and also the maximum number of points that may be deducted. It is important to note that rating points may be deducted for regulatory items which do or may effect drinking water quality or drinking water quantity. There are also regulatory items that, although required, are not considered to be detrimental to water quality or water quantity and are not associated with rating points deductions. Items for which no points deductions are assigned will be addressed in narrative form (i.e. a written summary detailing the regulatory requirement, an explanation of deficiencies noted and any corrective actions). Although certain items may be addressed with narrative, such items continue to be requirements of the regulations and must be addressed by the public water system. All deficiencies in each of the eight sections of the sanitary survey are to be addressed either by the deduction of points or narrative as listed on the Sanitary Survey Rating sheet. The points range, as listed on the survey rating sheet, simply represents a range of points associated with items contained in a particular subsection. The points range does not serve as a restriction regarding the deduction of points in a particular subsection. An example of this can be observed in Section 2 – Operator Compliance. In this section, twenty-three (23) total points are available yet the points range as listed on the sanitary survey rating form is conveyed as (3-15). This range represents the specific line item deductions individually possible in the subsection. However, individual deductions are assessed cumulatively but not to exceed the maximum available in the section. As stated above, the maximum number of points that may be deducted in each section is listed in each of the eight section headings. In each of the eight major sections, related subsections contain specific regulatory requirements and corresponding points deductions associated with the failure to adhere to such requirements. Points deductions should be made for each item that is applicable in each subsection. Points deductions in each subsection are added together to yield a points deduction subtotal for respective major sections. The sum of the eight subtotals yields the amount of total deductions. A final survey score will be dependent upon the total number of points deducted from applicable sections and upon the type of public water system subject to the survey i.e. Treatment System, Distribution System or both Treatment and Distribution. The total number of points available in each case varies and will be used to calculate a final score. Public water systems that are comprised of treatment facilities only or distribution facilities only will not be subject to each of the eight rating categories. Consequently, the available points utilized to rate such systems will vary by type of system. Consider the following table:

	Treatment Facility Only	Distribution Facility Only	Treatment and Distribution Facility
Applicable Sections	1, 2, 3, 4, 5, 7	1, 2, 5, 6, 7, 8	All Sections
Rating Points Available	488	421	599

Each of the eight section headings includes applicability identification corresponding to information contained in the table above. As can be seen above, systems may be rated only considering the applicable sections dictated by system type. For example, if a water system is a consecutive water system comprised of distribution facilities only, the water system would be rated based on 421 available rating points. If the public water system incurred thirty – six (36) deduction points, the sanitary survey score would be calculated as follows:

421 – 36 = 385 > > > 385/421 = 0.9145 x 100 = 91.45 = **91**

In another example, a pubic water system is comprised of both treatment and distribution facilities. Therefore, the water system would be rated based on 599 available rating points. If the public water system incurred thirty – six (36) deduction points, the sanitary survey score would be calculated as follows:

599 – 36 = 563 > > > 563/599 = 0.9399 x 100 = 93.99 = **93**

It should be noted that sanitary survey scores are expressed in whole numbers without consideration to fractional portions or rounding of numbers. For the purposes of sanitary survey scoring, fractional portions have been discarded. In addition, the sanitary survey score represents the achievement, expressed as a percentage of the total score available, of the water system with regard to system type.

With the sanitary survey score calculated, the numerical score is used to place the water system into one of three possible rating categories. Considering the rating categories contained on page 18 of this manual, each of the scores calculated above would place the example public water systems into the Provisionally Approved rating category (90% - 94%).

In addition to conveying a sanitary survey rating and score, it must be recognized that for certain situations and/or circumstances the sanitary survey correspondence may also be used to establish compliance deadlines or to contain a Notice of Violation (NOV) or Notice of Non-compliance (NONC). Items which are "critical" to the production or management of a system must be addressed by the public water system (PWS) immediately. In those instances the system will receive a NOV or NONC which initiates enforcement procedures to achieve compliance.

Further, although enforcement action may be initiated at any time for violations of the Safe Drinking Water Act and Division Rules, there are certain situations and/or circumstances which require that enforcement action be initiated and an Enforcement Action Request (EAR) forwarded to the Nashville Central Office or a Letter of Agreement (LOA) be executed. Circumstances that must be addressed with the initiation of enforcement action include the following:

1. **Any event which causes a public water system to become a Significant Non-Complier (SNC).**

2. **Any redundant survey deficiencies.**

3. **Any violation of critical items identified with (*) in the sanitary survey guidance material.**

1. System Management and Operation	Points (94)	Treatment and/or Distribution
A. Record Keeping		Drinking Water Regulations require all public water systems to generate and maintain certain records for various lengths of time. The Sanitary Survey process will address all of the records which water systems must retain.
Polymer Report	narrative	Consult 1200 -5-1-.17(31). Failure to submit to DWS and/or retain record(s).
Sanitary Surveys/ Division Correspondence	narrative	Consult 1200-5-1-.20(1). Failure to retain records.
New Tap Records	narrative	Consult 1200-5-1-.17(32). Failure to create and/or retain records.
Bacteriological sample analyses and/or summary forms	narrative	Consult 1200-5-1-.20(1). Failure to submit to DWS and/or retain record(s).
Bacteriological Sampling Site Plan	narrative	Consult 1200-5-1-.07(1). Failure to establish and/or retain Plan.
Turbidity Records and Forms	narrative	Consult 1200-5-1-.20(1). Failure to identify and/or retain records.
Chemical Analysis	narrative	Consult 1200-5-1-.20(1). Failure to retain records.
Lead and Copper Records	narrative	Consult 1200-5-1-.20(1). Failure to retain records.
Cross Connection Plans and Records	narrative	Consult 1200-5-1-.17(6), .20(1). Failure to retain records.
MORs and Daily worksheets	narrative	Consult 1200-5-1-.20(1). Failure to retain records.
Complaint Logs and records	narrative	Consult 1200-5-1-.17(24), .20(1). Failure to create and/or retain records.
Public notice, Special Notice, CCR and Public Education	narrative	Consult 1200-5-1-.20(1), .40(a)7. Failure to retain records.
Distribution Map	narrative	Consult 1200-5-1-.17(15). Failure to retain adequate map(s) of system.
Flushing Plan and Records	narrative	Consult 1200-5-1-.17(10). Failure to create and/or retain records.
Storage Tank Inspections and Maintenance Records	narrative	Consult 1200-5-1-.17(33). Failure to retain records.

Facility Maintenance Records	narrative	Consult 1200-5-1-.20(1). Failure to create and/or retain records.
Equipment Maintenance and repair records	narrative	Consult 1200-5-1-.17(17), .20(1). Failure to create and/or retain records.
Actions to correct violations	narrative	Consult 1200-5-1-.20(1). Failure to create and/or retain records.
Variance and Exemption records	narrative	Consult 1200-5-1-.20(1). Failure to retain records.
Emergency Operations Plan	narrative	Consult 1200-5-1-.17(7). Failure to establish and/or retain Plan.
Submission of Plans and Specifications	narrative	Consult T.C.A. 68-221-706, 1200-5-1-.05. Failure to submit to DWS and/or retain record(s).
Monitoring Plans and Schedules	narrative	Consult 1200-5-1-.20(1), .12(1)and (5), .17(3), .33(7) and (8), .36(6), .37(2), .39(2) and (3). Failure to retain records.
Wellhead Protection Plan/ Source Water Assessment	narrative	Consult 1200-5-1-.04, .17, .34. Failure to retain records
Turbidity Calibration / Verification Records	narrative	Consult 1200-5-1-.05(11), .31(5), .17(40), .17(41), policy. Failure to create and/or retain records.
Backwash recycling records	narrative	Consult 1200-5-1-.31(9). Failure to create and/or retain records.
Capacity Development Plan	narrative	Consult 1200-5-1-.17(37),(38). Failure to produce Plan if required and/or retain records.
Business Plan	narrative	Consult 1200-5-1-.04(5), .17(37),(38). Failure to produce Plan if required and/or retain records.
Standard Operating Procedures	narrative	Consult 1200-5-3-.04, DWS Guidance. Failure to establish and/or retain records if required.
Records Organization	narrative	Consult 1200-5-1-.20(1). Failure to maintain records in an organized fashion.
Corrective Actions	narrative	Consult 1200-5-1-.40. Failure to maintain records of corrective actions.
B. Construction Projects	Rating	Consult T.C.A. 68-221-706, Rule 1200-5-1-.05, .17(19). No new construction or modification may be made without approval of the Division. All projects must be constructed in accordance with approved plans and specifications. All new or modified treatment facilities must be inspected prior and approved prior to being placed into service.
*	5	Constructs project(s) without obtaining approval from the Department.

	3	Water System makes unapproved change in an approved water treatment or distribution system project.
	3	Water system fails to notify DWS prior to new or modified plant start-up.
	1	Water system fails to maintain a set of approved construction plans/specifications at or near job site.
	narrative	Water system fails to notify DWS prior to construction.
C. Submission of Monthly Operations Reports		Consult Rule 1200-5-1-.17(2). Each CWS and NTNCWS must submit a Monthly Operation Report (MOR), together will associated forms/reports, which contains all required information and accurately reveals the operation and performance of the water system during the reporting period. All MORs must be received in the appropriate Field Office by the 10th of the following month.
	narrative	Late reports, non submittal of reports, completion of reports.
D. Reporting Requirements		Consult Rules 1200-5-1-.18, .39(24), .40. All public water systems shall report to the Division of Water Supply of the failure to comply with drinking water regulations, situations that affect the quality or quantity of water or which do or may present a substantial endangerment to health. Recording, reporting or providing inaccurate or false data or statements to the State is prohibited.
	4	Failure to report any major breakdown or failure of equipment in the water treatment process which affects the quality or quantity of water leaving the water treatment plant.
	4	Failure to report any serious loss of water service due to a failure of transmission or distribution facilities, including breaks exceeding 24 hours to repair.
	4	Failure to report any situation with the water system which presents or may present an imminent and substantial endangerment to health, i.e. fecal, nitrate, primary chemical or turbidity MCL, an identified cross connection, etc. Failure to respond to significant deficiencies or meet Department-specified requirements.
*	30	Recording and/or reporting any data or information which is inaccurate, misleading, false or information known or that should be known to be false.
	6	Reporting any data or information that is inaccurate, misleading or false because the person reporting has not used reasonable care, judgment or application of knowledge in the preparation of such data.
	4	Providing inaccurate or false statements to the State.
E. Public Notification		Consult Rule 1200-5-1-.19. All water systems which fail to meet a primary drinking water standard, fail to monitor a primary drinking water contaminant or fail to apply or comply with a required treatment technique must notify the affected system customers. Public water systems must also provide public notice for any situation which may present an imminent and substantial endangerment to health.
	10	Failure to provide Tier 1 public notification as required.
	3	Failure to provide Tier 2 public notification as required.
	narrative	Failure to provide Tier 3 public notification as required.

	narrative	Failure of public notice to provide/contain mandatory language.
	narrative	Failure to provide public notice timely.
	narrative	Failure to provide notification and/or certification to DWS.
F. Facility Maintenance Fee		Consult Rule 1200-5-1-.32. All public water systems are required to pay an annual facility maintenance fee according to the schedule prescribed by rule.
	narrative	Non-payment or late payment of applicable facility maintenance fee.
G. Enforcement		T.C.A. 68-221-701 et seq. Any water system which has been directed by the Department must fulfill the requirements or compliance schedules resulting form a Commissioner's Order, Director's Order, Agreed Order, Final Agreed Order, Judgment or Decree. Any requirements set forth in any executed Letter of Agreement or Notice of Non-Compliance must be fulfilled.
	10	Failure to comply with schedules of a Commissioner's Order , Director's Order or Agreed Order.
*	4	Failure to comply with Letter of Agreement
	narrative	Failure to comply with requirements and/or time schedules of a Notice of Violation or Notice of Non-Compliance.
H. Emergency Operations Plan		Consult Rules 1200-5-1-.17(7), .34(4). All community water systems must have an approved Emergency Operations Plan (EOP) to safeguard the water supply and notify the public of unsafe drinking water.
	3	Failure to adhere to the E.O.P. during system emergency or actual or potential contamination of the system
2. Operator Compliance	**(23)**	**Treatment and/or Distribution**
A. Certified Operator		Consult T.C.A. 68-221-901 et seq., 1200-5-3 and DWS Guidance. All water treatment facilities and/or distribution systems must have a person in direct charge, properly certified under the Water Environmental Health Act, and whose decisions and directions control the manipulation of equipment and thereby determine the quality and quantity of water supplied. Systems which lose their Certified Operator in direct charge are required to obtain a properly certified operator within 30 days unless otherwise directed by the Board.
*	15	Failure to meet both treatment and distribution certification requirements.
*	7	Failure to meet either treatment or distribution certification requirements.
	3	Failure to demonstrate availability considering system size, complexity and source water quality.
	5	If there has been an occasion when the treatment plant has been left unattended when attendance is required.
	narrative	Operator in direct charge has not been designated and on record with the Certification Board.
	narrative	Failure to notify DWS of the loss of a Certified Operator in direct charge.

	narrative	If prepared SOP documents do not delineate the responsibilities or water system personnel or other minor issues exist.
3. Source	**(25)**	**Treatment**
A. Source Adequacy		Consult 1200-5-1-.05, .16, .34(3). Impounded surface supplies must have a minimum of 30 days supply. Streams and rivers must have enough water at the 3 day - 20 year low-flow to meet the maximum demand. The 3 day - 20 year low-flow of a spring must be able to meet maximum demand. The maximum safe yield of a well or well field must be able to meet demand. Source and facilities should be relatively free of major upstream discharges, flooding, etc. Water quality characteristics must be evaluated for new sources and sites prior to placing them into service.
	5	Unapproved source.
	3	Periodic adequacy problems.
	4	Failure to evaluate ground water source for GWUDI or failure to provide treatment.
B. Intake		Consult 1200-5-1-.05, .17. Surface water intake structures must be well maintained and include screens at water level, ventilation and must be secure.
	2	Failure to properly maintain surface water intake structures.
	2	Failure to provide security measures.
C. Wellhead / Springbox Construction		Consult 1200-5-1-.05, .16, .34, .17. Wells and springs must be protected against surface contamination. Well casing must extend above ground 6 inches or above the 100 year flood level and annular space must be properly backfilled. Spring boxes must be properly constructed and sealed. Vents on wells and springs must be screened.
	2	Failure to protect wells or springs from surface contamination.
	2	Failure to observe the proper siting requirements
	2	Failure to protect wells or springs from surface water drainage.
D. Source Protection Plans		Consult Rule 1200-5-1-.34. Public water systems using a ground source must complete a Wellhead Protection Plan. Public water systems using a surface source must complete, and update annually, a contaminant source inventory and source water protection plan.
	2	Failure to complete a Wellhead Protection Plan or Source Water Protection Plan.
	1	Failure to up-date Wellhead Protection or Source Water Protection Plan as required.
4. Treatment	**(153)**	**Treatment**
A. Aerator		Consult 1200-5-1-.05, .17. Aerators must be functional and well maintained. Aerators must not be overloaded, unscreened or unprotected. Media must be maintained. Aerators must be designed to control the amount of aeration needed.
	2	Aerators are overloaded or is shown not to remove CO2 to less than 20ppm.
	2	Aerators are not maintained.

B. Chemicals/ Chemical Feeders		Consult 1200-5-1-.05, .17, .36. All facilities must have sufficient chemical feeders to properly treat water. Backup feeders must be available to maintain all steps in the treatment process except fluoridation. Feeders must be properly maintained and properly sized. NSF or ANSI approved chemicals and lubricants must be used.
	2	Failure to provide sufficient number of chemical feeders.
	2	Chemical feeder(s) in need of repair or improperly sized.
	2	Chemicals fed are not NSF or ANSI approved.
	2	Failure to provide/feed appropriate chemicals as necessary or directed by DWS.
C. Mixing		Consult 1200-5-1-.05, .17. All systems which add chemicals must insure that proper mixing takes place through mechanical mixers, static in-line mixers or turbulence. Baffling systems must prevent short circuiting.
	2	Sizing or any component of the mixing process is inadequate.
D. Flocculation		Consult 1200-5-1-.05, .17. Flocculation basins must be maintained and mechanical flocculators must be in working order. Flocculation basins must provide a minimum of 30 minutes detention time and must not allow short circuiting.
	2	System is inadequately sized.
	2	System is not operational or deterioration causes water treatment problems.
E. Sedimentation		Consult 1200-5-1-.05, .17 and Design Criteria. Sedimentation basins must be properly sized and provide adequate detention time. Sludge accumulation must not impair turbidity removal. Tube settlers must not be allowed to coat over with sediment and/or algae. Up-flow clarifiers must have minimum detention time of 1 hour and a flow rate not to exceed 1.0 gpm/ft2. Basins must be equipped with a functional drain and overflow. Weirs must be level to provide even flow.
	2	Basins are inadequately sized or basin short circuiting occurring.
	2	Drains and/or overflows inoperable or inadequately sized.
	2	Sludge removal and/or sludge removal equipment is inadequate.
	2	Mechanical equipment improperly maintained.
F. Filtration / Alternative Technology		Consult 1200-5-1-.05, .17, .31, .39. Filtration treatment must be provided where required. Filter beds must conform to specifications as set forth by rule. Membrane filtration must undergo challenge testing to demonstrate removal efficiency. Rate of filtration must not exceed that approved by the Division. Loss of head gauges, rate of flow controllers and other equipment must be maintained and operable.
	2	Process or equipment is improperly sized , filter bed specifications are not met or challenge testing to demonstrate removal efficiency is not performed.
	2	Exceedance of rate of filtration flow approved by the DWS.
*	30	Failure to filter and/or provide filtration treatment as required.
	2	Loss of head gauges, rate of flow controllers and other equipment is inoperable or not maintained in good working order.

G. Rewash / Filter to Waste		Consult 1200-5-1-.17. All subpart H systems must have rewash or filter-to-waste capability. Rewash or filter-to-waste procedures shall be conducted in a manner to prevent the introduction of contaminants into the clear well. As an alternative, systems excluded from the rewash requirement must demonstrate that their backwash cycle is conducted in a manner to prevent the introduction of contaminants into the clear well or distribution system.
	2	Filter to waste is not provided or is not sufficient to prevent contaminants from entering the clear well.
H. Turbidimeters / Calibration		Consult 1200-5-1-.05, .17, .31, .39. Turbidity monitoring and recording equipment must be available and operational where required. Alarm and/or automatic shut off capability must be provided on all unmanned facilities where required. All turbidimeters used for compliance purposes must be calibrated no less often than 90 days and pursuant to manufacturers recommendations. Comparisons of primary and secondary standards are mandatory. Check samples for verification of calibration must be performed as required.
	4	Turbidimeters are not available where required.
	3	Alarm or automatic shut off capability not provided.
	2	Calibration not performed according to manufacturers specifications or every 90 days.
	2	Turbidimeter(s) out of service for more than 5 days.
	2	Failure to perform verification of turbidimeters and/or re-calibrate as required.
I. Disinfection/ Calibration		Consult 1200-5-1-.14(10), .17, .31, .36, .40. Disinfection treatment must be provided where required. Duplicate disinfection equipment must be provided, operational and utilized. Ground water systems must correct significant deficiencies as prescribed in Rule 1200-5-1-.40.
*	30	Failure to disinfect and/or provide disinfection equipment where required.
	4	Disinfection equipment is not operational. Failure by a ground water system to correct significant deficiencies as required.
	3	Duplicate disinfection equipment is not available or not utilized.
	2	Failure to perform instrument calibration as required, insufficient equipment, scales, etc.
J. Disinfection Contact Time		Consult 1200-5-1-.17, .31, .40. All water systems that disinfect must provide adequate contact time before the first customer. Ground water systems must provide 4-log treatment of viruses before or at the first customer. Surface water and GWUDI systems must obtain an inactivation ratio of 1.0 before the first customer.
	4	Failure to provide adequate contact time or maintain an inactivation ratio of 1.0 or greater. Failure by a ground water system to provide 4-log treatment of viruses at the first customer.
	2	Treatment Plant and/or Clear well configuration and volume fails to provide adequate contact time for full plant capacity.
K. Master Meter		Consult 1200-5-1-.17. Water systems which are prescribed a laboratory monitoring schedule must have master meter(s) to measure raw and finished water. The meter(s) must be operable and maintained to facilitate correct chemical dosages relative to the amount of water treated.
	2	Meter is not available or is inoperable.

	1	Meter is not accurate.
L. Maintenance of Equipment, Buildings and Grounds		Consult 1200-5-1-.17. All equipment used in the treatment process must be maintained and operable. All buildings, clear wells, grounds must be maintained and secured. Adequate lighting, ventilation, drains, dehumidifiers, toilet facilities, heaters, air conditions, etc. must be provided. No storage of hazardous chemicals or other materials not used in the treatment process must be permitted.
	1	Maintenance is required and/or security is inadequate.
	narrative	Minor maintenance issues.
M. Laboratory Facilities		Consult 1200-5-1-.17(3). Treatment plants must have all chemical, physical, and bacteriological equipment necessary to monitor and control the operation of the facility as required based on the DWMP. The equipment must be maintained and operable.
	3	Failure to provide laboratory where one is needed.
	2	Failure to provide proper lab equipment, equipment is not operational or lab is not of adequate size.
	1	Failure to provide adequate environmental controls.
N. Safety		Design Criteria Parts 5.2-5.4. All needed protective equipment must be available. Chlorine cylinders must be secured and chlorine rooms must have operable exhaust fans. Chlorinators must be vented to the outside with screens on vent lines. Incompatible compounds must not be stored together.
	2	Lack of needed protective equipment.
	2	Failure to provide adequate and operable exhaust equipment for chlorine rooms.
	2	Failure to provide adequate chlorinator vent lines and/or screens.
	2	Incompatible compounds stored together.
O. Sludge Handling / Backwash Handling		Consult 1200-5-1-.05. Treatment facilities with sedimentation and/or filtration must have adequate sludge handling/ back wash handling capabilities. Sludge and back wash handling facilities must be sized to allow proper operation of the plant. Discharges of treated or untreated water to a stream must have a National Pollution Discharge Elimination System (NPDES) permit. Discharges to a well or depression must have an Underground Injection Control (UIC) permit.
	2	Inadequately sized sludge units, inoperable equipment or lack of maintenance.
P. Sanitary Conditions		Consult 1200-5-1-.17. Unsanitary conditions, with potential for adverse affects on water quality, must not be permitted including during construction activities. There must be no evidence of pets, pests or refuse.
	2	Poor or unsanitary conditions with potential to impact water quality including, pets, pests, refuse, construction or general housekeeping.
Q. Fluoridation Techniques		Consult 1200-5-1-.06, .12, .17. Systems which fluoridate must use proper methods and procedures. Equipment must be maintained. Sampling must be performed.

	2	Improper dosing, failure to maintain equipment or failure to conduct sampling.
R. Design Capacity		Consult 1200-5-1-.05, .17, .31. Components of the water system must meet the design standards imposed by the SDWA Rules. Average daily water use must not exceed the design capacity of the treatment plant.
	4	Exceedance of design capacity
	2	System has exceeded 85% of design capacity and has failed to initiate actions for expansion.
S. Filter Backwash Recycling		Consult 1200-5-1-.31(9). All subpart H systems with conventional or direct filtration that recycle back wash water, thickener supernatant, or liquids from dewatering processes must provide a schematic showing the origin of all flows which are recycled and a typical recycle flow.
	1	Failure to provide a plant schematic on origin of flows and typical recycle flow data or failure to maintain recycle flow information as specified in 1200-5-1-.31(9)(d).
5. Monitoring and Data Verification	**(175)**	**Treatment and/or Distribution**
A. Laboratory Process Monitoring		Consult 1200-5-1-.17(3). All water treatment facilities must monitor the water treatment process in accordance with the monitoring program established by the Division. Tests must be performed according to established procedures. Data must be reviewed and compared to validate reported information.
	2	Failure to monitor established parameters.
	2	Failure to perform tests according to established procedures.
B. Bacteriological Monitoring		Consult 1200-5-1-.07, .40. All public water systems must perform bacteriological monitoring according to population served and at a frequency prescribed by regulation. Water systems must meet all routine, elevated routine and/or repeat monitoring requirements. Samples must be collected from valid / representative distribution locations according to a sampling site plan. Ground water systems must conduct source water monitoring in accordance with Rule 1200-5-1-.40.
	6	Failure to submit any valid samples during more than 1 monitoring period.
	3	Failure to submit any valid samples during 1 monitoring period.
	2	Failure to submit all required samples during a monitoring period. Failure to collect representative samples or in accordance to the sampling site plan. Failure by a ground water system to conduct assessment source water monitoring as required.
	3	Failure to conduct repeat monitoring as required for 1 monitoring period. Failure by a ground water system to conduct triggered source water monitoring as required.
	6	Failure to conduct repeat monitoring as required for more than 1 monitoring period.

C. Bacteriological Compliance		Consult 1200-5-1-.06. Systems collecting fewer than 40 routine samples per sampling period may have no more than 1 positive sample. Systems collecting more than 40 samples per sampling period may have no more than 5% samples positive. Fecal or E coli positive repeat samples or fecal or E coli positive routine samples followed by total coliform positive repeats samples constitutes an Acute Violation of the MCL.
	4	Bacteriological non-acute MCL violation.
	7	Bacteriological acute MCL violation
D. Turbidity Monitoring		Consult 1200-5-1-.08, .17(26), .31, .39. All systems required to monitor turbidity must monitor continuously unless otherwise approved by the Division. Systems which employ filtration treatment must monitor individual filter effluent turbidity and combined filter effluent turbidity and record results. For any individual filter that has measured turbidity greater than 1.0 NTU or 0.5 NTU in two consecutive measurements taken 15 minutes apart pursuant to regulation, the system must report the exceedance and must produce a filter profile or identify the obvious reason for the abnormal performance. For any individual filter that has measured turbidity greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in 2 consecutive months, the system must report the exceedance and arrange to conduct a comprehensive performance evaluation by the State or party approved by the State. All membrane filtration facilities must provide daily direct integrity testing and continuous indirect integrity testing unless otherwise approved by the State.
	3	Failure to monitor and/or record as required.
	3	Failure to maintain continuous monitoring/recording for each individual filter and/or combined filter effluent or conduct grab sampling as required.
	3	Failure to conduct filter profile(s).
	2	Failure to complete and/or submit filter exceedance report(s).
	3	Failure to perform comprehensive performance evaluation (CPE) as required.
	3	Failure to perform direct integrity testing daily (membrane filtration).
	3	Failure to provide indirect integrity testing (membrane filtration).
	narrative	Failure to properly label turbidity records.
E. Turbidity Compliance		Consult 1200-5-1-.06, .31. True ground water systems directed to monitor turbidity must comply with the MCL for turbidity. GWUDI systems that have qualified to avoid filtration treatment must comply with treatment technique requirements. Subpart H water systems must comply with treatment technique requirements.
	4	Exceedance of MCL for turbidity.
	4	Turbidity treatment technique violation - 95% < 0.3 NTU
	7	Turbidity treatment technique violation - single exceedance
F. Continuous Chlorine Residual Monitoring		Consult 1200-5-1-.17(4), .31, .36, .40. Subpart H systems and ground water systems serving more than 3,300 individuals must monitor continuously and report the lowest value each day that water is served. Subpart H systems and ground water systems serving less than 3,300 individuals must monitor at a frequency prescribed by regulation and report the lowest value each day water is served.
	3	Failure to monitor and/or record chlorine as required.

	2	Equipment inoperable or not returned to service within 5 days for subpart H systems or within 14 days for ground water systems.
G. Primary Chemicals Monitoring		Consult 1200-5-1-.09, .10, .11, .24, .25, .26, .36, .37, .38. All public water systems must monitor primary chemicals in accordance with regulations. Confirmation samples must be collected as specified by regulation.
	3	Failure to monitor (any parameter)
	3	Failure to meet confirmation sampling or repeat sampling if required.
	2	Failure to collect sample(s) from acceptable locations.
	2	Failure to monitor (Sodium)
H. Primary Chemical Compliance		Consult regulations cited above. All water systems must meet the MCLs for primary chemicals based on regulation.
	4	Failure to comply with MCL (any parameter)
I. Lead and Copper Monitoring		Consult 1200-5-1-.33. All Community and Non Transient Non Community water systems must monitor for lead and copper based on population. If an exceedance of the lead and copper action level occurs or a system serves a population greater than 50,000 individuals, water quality parameter monitoring must be conducted. Subsequent to testing, an Optimal Corrosion Control Treatment Recommendation must be submitted to the Division.
	3	Failure to monitor
	3	Failure to conduct water quality parameters monitoring (>50,000 population).
	2	Failure to submit Optimal Corrosion Control Treatment Recommendation (OCCTR).
J. Lead and Copper Action Level Compliance		Consult 1200-5-1-.33. All CWSs and NTNCWSs must meet lead and copper action levels. If testing shows exceedances of the action level for either parameter corrective measures must be taken to insure the quality of water such as optimal corrosion control plan and water quality parameter testing.
	5	Exceedance of the 90th percentile for Lead.
	3	Exceedance of the 90th percentile for Copper.
	3	Failure to maintain Optimal Corrosion Control Treatment as required.
K. Disinfection/ DBPs and Precursors Monitoring		Consult 1200-5-1-.36, .37, .38. Community Water Systems and Non Transient Non Community Water Systems must monitor for disinfection by products and maximum residual disinfection levels for disinfectants. Systems must also monitor for disinfection by product precursors.
	3	Failure to monitor disinfection by-products as required.
	3	Failure to perform disinfectant monitoring as required.
	2	Failure to monitor TOC as required.
	3	Failure to monitor Bromate/Bromide or Chlorite as required.

L. Disinfection/ DBPs and Precursors Compliance		Consult 1200-5-1-.06. 36. Community and Non Transient Non Community Water Systems must meet MCLs for disinfection by products and MRDLs for disinfectants. Systems must meet minimum disinfectant levels in water entering the distribution system and in distribution system samples. Systems must also meet removal requirements for disinfection by product precursors.
*	30	Acute violation of the MRDL for Chlorine Dioxide.
	5	Non-acute violation of the MRDL for Chlorine Dioxide.
	4	Failure to meet MRDL for disinfectants other than Chlorine Dioxide.
	4	Failure to meet MCL for disinfection by-products.
	4	Failure to meet MCL for bromate or chlorite.
	2	Failure to meet TOC removal requirements.
	4	Disinfectant residuals (chlorine and chloramines) below 0.2 mg/L in more than 5% of samples.
	4	Disinfectant residuals (chlorine and chloramines) for water entering the distribution system below 0.2 mg/L for more than 4 hours.
M. Secondary Chemicals		Consult 1200-5-1-.12. All CWSs and non community water systems as deemed necessary must conduct secondary chemicals monitoring.
	2	Failure to monitor for secondary chemicals as required.
N. Secondary Chemical Compliance		Consult 1200-5-1-.12. All water systems required to monitor secondary chemicals must meet MCLs for secondary standards.
	3	Failure to meet MCL for secondary standards.
O. Crypto-sporidium Monitoring		Consult 1200-5-1-.39. All subpart H systems must conduct an initial and a second round of source water monitoring for each plant that treats a surface water of GWUDI source. Systems are also required to submit a sampling schedule that specifies the calendar dates when the system will collect each required sample. Systems must respond to significant deficiencies identified during the sanitary survey process.
	narrative	Failure to submit sampling schedule(s). Failure to report source water monitoring.
	narrative	Failure to conduct monitoring as required or sample from appropriate locations.
	narrative	Failure to meet treatment technique requirements (filtered and unfiltered systems). Failure to respond to significant deficiencies as required.
	narrative	Failure to determine bin classification.
6. Finished Water Storage	**(25)**	**Distribution**
A. Adequate Storage		Consult 1200-5-1-.17. All community water systems serving 50 or more service connections must have 24 hours of distribution storage based on average daily demand for the past twelve months. Such storage must be located to meet instantaneous demand in all areas at any time.
	4	Failure to meet 24 hour storage requirements based on average daily demand.
	2	Failure to locate water storage in a manner to meet instantaneous demand.

B. Inspection and Maintenance of Reservoirs and Tanks		Consult 1200-5-1-.17. All water storage tanks and reservoirs must be professionally inspected every 5 years. All tanks and reservoirs appurtenant works must be properly maintained and secured. All vents and overflows must be screened and protected. There should be no evidence of unsanitary or unfit conditions. Professional tank inspection reports must address all aspects of the tank.
*	10	Evidence of unsanitary conditions (presence or evidence of animals, birds, insects, debris, or other foreign substances, openings, discoloration, odor or other unfit condition).
	7	Failure to have professional tank inspections every five years.
	1	Failure to provide adequate security.
	1	Failure to provide proper screens, flaps, locks, etc. or other protective measures or perform maintenance activities.
7. Pumps, Pump Facilities and Controls	**(18)**	**Treatment and/or Distribution**
A. Pump Facilities		Consult 1200-5-1-.17. All CWSs serving 50 or more service connections must have duplicate pumps for raw water, finished water and distribution pumping stations unless otherwise approved by the Division. Pumps must be adequately sized to meet plant and distribution system demands and must be secured.
	4	Failure to provide duplicate pumps (raw water, finished water and pump stations).
	3	Duplicate or back up pumps are of insufficient size.
	3	Pumping capacity is inadequate to meet plant capacity after removing largest pump.
	2	Lack of low suction cut off devices.
	1	Failure to provide adequate security.
B. Maintenance of Pumping Equipment		Consult 1200-5-1-.17. All pumps, pumping equipment and pumping facilities must be maintained.
	3	Inoperable pump(s) has not been repaired or scheduled for repair.
	1	Pump(s) is/are leaking or vibrating excessively.
	1	Pump facilities require maintenance attention (drains, de-humidifiers, sump pumps, etc.).
8. Distribution and Cross Connections	**(86)**	**Distribution**

A. Notification, Inspection and Disinfection of New or Existing Facilities		Consult 1200-5-1-.17(8). All new or existing facilities must be disinfected, flushed and have bacteriological samples collected prior to being placed into service following construction, inspection, maintenance or repair. Sanitary practices must be followed and documented to include disinfection procedures. Bacteriological sample(s) collected for maintenance/repair of existing facilities must be collected to represent water contained in the repaired line, tank, or filter. Disinfectant residual must be monitored on new taps where the main line had to be uncovered to make the tap. A Certified Laboratory must be used for bacteriological sampling analysis. Disinfectants used must be NSF approved.
	5	Failure to provide adequate disinfection, flushing or bacteriological sampling for main line repairs or new main lines.
	5	Failure to collect bacteriological samples representative of a repair area or prior to the main line being placed back into service.
	3	Failure to flush and monitor disinfectant residual on new service taps where the main line had to be uncovered to make the tap.
	5	Failure to properly flush, disinfect and/or collect bacteriological samples for a tank(s) or a reservoir(s) after entry, dewatering, cleaning, inspection, repair or other compromising of the integrity of a tank or reservoir has been made and prior to being placed back into service.
	4	Failure to utilize a certified laboratory for bacteriological samples collected to indicate effectiveness of disinfection practices.
	3	Failure to make and/or maintain records documenting procedures utilized, flushing activities, disinfection practices and/or bacteriological sampling for new facilities and/or repair activities.
B. Flushing Program / Blow Offs		Consult 1200-5-1-.17(10)(23). All CWSs with 50 or more connections must establish and maintain an adequate flushing program to ensure that dead end and low use mains are flushed, drinking water standards are met, sediment and air is removed and disinfectant residual is maintained. All dead end mains and all low points in mains must be equipped with a blow-off or other suitable flushing mechanism capable of producing velocities adequate to flush the main.
	4	Failure to establish, initiate and/or maintain an adequate flushing program.
	3	Failure to maintain an active flushing program.
	4	Lack of flushing causes water quality problems, failure to remove air and sediment, reduced residual disinfectant, taste and odor issues, red water, etc.
	3	Failure to equip all dead end mains and low points in water mains with a blow-off or other suitable flushing mechanism.
C. Fire Hydrants		Consult 1200-5-1-.17(18). Fire hydrants must not be installed on water mains that are less than 6 inches in diameter or that cannot produce 500 gpm at 20 psi unless the tops are painted red. Existing hydrants that are unable to deliver 500 gpm at 20 psi (Class C) must have their tops painted red by January 1, 2008. Beginning January 1, 2008, water systems must provide certified mail notification, to each fire department that may use the hydrants, of color coding and use restrictions pursuant to regulation.
	narrative	Failure to properly color code Class C fire hydrants.

	narrative	Failure to provide notification to each fire department that may have reason to use the hydrants of Class C hydrants and corresponding color coding and use restrictions as required.
D. Adequate Pressure		Consult 1200-5-1-.17(9), .05(9). All CWSs must be operated and maintained to provide a minimum positive pressure of 20 psi throughout the distribution system.
	5	Failure to maintain 20 psi positive water pressure to all customers and no action has been initiated to correct the problem.
E. Map of Distribution System		Consult 1200-5-1-.17(15). All CWSs with 50 or more connections must have and maintain up-to-date maps of the distribution systems documenting locations and sizes of mains, valves, blow-offs or flush hydrants, air release valves and fire hydrants. Overall system distribution map(s) must be submitted to the DWS every 5 years.
	3	Failure to have a current map on file showing lines, line sizes, valves, blow-offs, hydrants, etc.
	narrative	Failure to maintain up to date maps.
	narrative	Failure to submit a generalized map of lines and line sizes to the DWS as required.
F. Cross Connection Policy or Ordinance		Consult T.C.A. 68-221-711(6), 1200-5-1-.17(6). The installation, allowing the installation, or maintenance of any cross connection, auxiliary intake or bypass is prohibited unless the source and quality of water, method of connection, use and operation is approved by the Department. All CWSs must adopt and have a cross connection ordinance or policy to prohibit the above and submit an executed copy to the Department for approval.
	4	Failure to adopt a Cross Connection Policy or Ordinance or submit such Policy or Ordinance to the DWS for approval.
G. Working Cross Connection Program		Consult 1200-5-1-.17(6). All CWSs must establish and maintain an ongoing program for the detection and elimination of hazards associated with cross connections.
	9	Installing or allowing the installation or maintenance of any cross connection, auxiliary intake or bypass unless approved by the Department.
	3	Failure to develop and submit a written plan for cross connection control.
	5	Failure to establish an ongoing program for the detection and elimination of hazards associated with cross connections.
	3	Failure to identify hazards in the system.
	5	Failure to conduct annual testing of all known backflow prevention assemblies.
	4	Failure to conduct surveys and/or resurveys of new and existing customers.
	3	Failure to conduct initial testing of installed assemblies or failure to conduct follow-up testing on failed assemblies.
	3	Assemblies tested by an individual that has not demonstrated competency for testing assemblies.

Unaccounted Water Loss		Although not required by rule, the DWS recommends that public water systems initiate efforts to determine unaccounted water use or water loss.
	narrative	Annual unaccounted water use or loss in excess of levels established by the Water Finance Board should be investigated by the water provider.
Total Treatment Points	488	To be used for treatment systems or wholesalers of water that do not have distribution facilities.
Total Distribution Points	421	To be used for consecutive systems comprised of distribution facilities only
Total Treatment and Distribution Points	599	To be used for systems comprised of both treatment and distribution facilities.
Survey Rating		
	95 to 100	Approved
	90 to 94	Provisionally Approved
	0 to 89	Unsatisfactory

Appendix 1

Sanitary Survey Letter General Specifications

Fonts - Acceptable fonts shall include: Arial, Courier and Times New Roman.

Margins, Point Sizes - Letter margins shall be (plus or minus 15%) 1 inch at the top, 1 inch at the bottom, 1 inch on the sides. Letters should be written in 12 size point.

Signatures - all signatures on original letters shall be **personally** signed (not stamped, computer reproduced, etc.)

Paper - Letterhead and paper shall conform to current guidance. Guidance dated November 1995 provides for all original letters to be on State Watermark Bond paper. Copies for files, etc. may be copied on copy paper. Letterhead shall be within specifications. This guidance may be superseded at any time.

Appendix 2

DRINKING WATER MONITORING PROGRAM (DWMP)
(Example Only – May be modified as applicable or amended for Membrane Filtration Facility)

Raw Water (daily sample, collected prior to any chemical additions)
TOC (Total Organic Carbons)
Temperature
Turbidity
Alkalinity (Total)
PH
Hardness
Iron
Manganese
Fluoride
Bacteriological
Jar Test (Once a week or more frequently as needed)

Settled Water (daily sample, collected before filtration)
Turbidity
Chlorine residual (free)
Aluminum or Ferric Chloride (FeCl3)
Iron or Manganese (Fe or Mn)

Finished Water (daily sample, except as noted, collected after filtration)
CT Profile (flow rate, etc.)
Bacteriological
Turbidity – entry point
Chlorine Residual (free)
Temperature
Alkalinity
Hardness
pH
Fluoride
Phosphate
Iron
Manganese

Distribution Water (daily samples, in addition to samples collected according to monitoring sampling plans)
Chlorine Residual (free)
Fluoride
Iron
Manganese
Phosphate

Sanitary Survey Rating

System: _____

Date: _____

I. System Management and Operation (94)

	Requirement	Points Range	Deduction	Comments
A.	Record Keeping 1200-5-1-.20	(0)	Narrative	
B.	Construction Projects 1200-5-1-.05, 1200-5-1-.17	(1-5)		
C.	Submission of Monthly Operations Reports 1200-5-1-.17	(0)	Narrative	
D.	Reporting Requirements 1200-5-1-.18	(4-30)		
E.	Public Notification 1200-5-1-.19	(3-10)		
F.	Facility Maintenance Fee	(0)	Narrative	
G.	Enforcement – T.C.A. §68-221-701 et seq.	(4-10)		
H.	Emergency Operations Plan 1200-5-1-.17	(3)		

Deficiency Subtotal

2. Operator Compliance (23)

	Requirement	Points Range	Deduction	Comments
A.	Certified Operator - Plant and Distribution System 1200-5-1-.17(1) and 1200-5-3-.04	(3-15)		

Deficiency Subtotal

3. Source (25)

	Requirement	Points Range	Deduction	Comments
A.	Source Adequacy 1200-5-1-.02, .05, .16, .17(13) and .34(3)	(3-5)		
B.	Intake 1200-5-1-.05, .17	(2)		

C.	Wellhead/Springbox Construction 1200-5-1-.05(12), .16 and .17(3) and (16)	(2)		
D.	Source Protection Plans 1200-5-1-.34	(1-2)		

Deficiency Subtotal

4. Treatment (153)

	Requirement	Points Range	Deduction	Comments
A.	Aerator 1200-5-1-.05, .17	(2)		
B.	Chemicals / Chemical Feeders 1200-5-1-.05 (8) and .17, .36	(2)		
C.	Mixing 1200-5-1-.02, .05, .17	(2)		
D.	Flocculation 1200-5-1-.02, .05, .17	(2)		
E.	Sedimentation 1200-5-1.02, .05, .17	(2)		
F.	Filtration / Alternative Technology 1200-5-1-.17(12) and (27)	(2-30)		
G.	Re-Wash / Filter-to-Waste 1200-5-1-.17(35)	(2)		
H.	Turbidimeters / Calibration 1200-5-1-.05(11), .17, .31, .39	(2-4)		
I.	Disinfection 1200-5-1-.02, .17, .31, .36	(2-30)		
J.	Disinfection Contact Time 1200-5-1-.02, .17, .31	(2-4)		
K.	Master Meter 1200-5-1.17(2) and (3)	(1-2)		
L.	Maintenance of Equipment, Buildings and Grounds 1200-5-1-.02, .17(3), (17) and (19)	(1)		
M.	Laboratory Facilities 1200-5-1-.02, .14, .17(3)	(1-3)		
N.	Safety 1200-5-1-.02	(2)		
O.	Sludge Handling/Backwash Handling 1200-5-1-.05	(2)		
P.	Sanitary Conditions 1200-5-1-.17(17)	(2)		
Q.	Fluoridation Techniques 1200-5-1-.06, .12, .17	(2)		
R.	Design Capacity 1200-5-1-.05(10)	(2-4)		
S.	Filter Backwash Recycling 1200-5-1-.31(9)	(1)		

Deficiency Subtotal

5. Monitoring, Data Verification and Compliance (175)

	Requirement	Points Range	Deduction	Comments
A.	Laboratory-Process Monitoring (excluding Turbidity and Chlorine Residual) 1200-5-1-.17(3)	(2)		
B.	Bacteriological Monitoring	(2-6)		
C.	Bacteriological Compliance 1200-5-1-.06	(4-7)		
D.	Turbidity Monitoring	(2-3)		
E.	Turbidity Compliance	(4-7)		
F.	Chlorine Residual Monitoring 1200-5-1-.17, .31, .36	(2-3)		
G.	Primary Chemicals Monitoring	(2-3)		
H.	Primary Chemicals Compliance	(4)		
I.	Lead and Copper Monitoring 1200-5-1-.33	(2-3)		
J.	Lead and Copper Action Level 1200-5-1-.33	(3-5)		
K	Disinfection/Disinfection By-Products and Precursors Monitoring 1200-5-1-.36, .37, .38	(2-3)		
L.	Disinfection/Disinfection By-Products and Precursors Compliance 1200-5-1-.06, .36	(2-30)		
M.	Secondary Chemicals 1200-5-1-.12	(2)		
N.	Secondary Chemicals Compliance 1200-5-1-.12	(3)		
O.	Cryptosporidium Monitoring 1200-5-1-.39	(0)	Narrative	

Deficiency Subtotal

6. Finished Water Storage (25)

	Requirement	Points Range	Deduction	Comments
A.	Adequate Storage 1200-5-1-.17(14)	(2-4)		
B.	Inspection and Maintenance of Reservoirs, Tanks and Clearwell 1200-5-1-.17(16), (17), (33) and (34)	(1-10)		

Deficiency Subtotal

7. Pumps, Pump Facilities and Controls (18)

	Requirement	Points Range	Deduction	Comments
A.	Pump Facilities 1200-5-1-.17(9) and (13)	(1-4)		
B.	Maintenance of Pumping Equipment 1200-5-1-.17(13)	(1-3)		
		Deficiency Subtotal		

8. Distribution System and Cross Connection Controls (86)

	Requirement	Points Range	Deduction	Comments
A.	Notification, Inspection, Disinfection and Sample Collection of New or Existing Facilities 1200-5-1-.17(8), (19)	(3-5)		
B.	Flushing Program / Blow Offs 1200-5-1-.17(10) and (23)	(3-4)		
C.	Fire Hydrants 1200-5-1-.17(18)	(0)	Narrative	
D.	Adequate Pressure 1200-5-1-.17(9)	(5)		
E.	Map of Distribution System 1200-5-1-.17(15)	(3)		
F.	Approved Cross Connection Policy or Ordinance and Plan 1200-5-1-.17(6)	(4)		
G.	Working Cross Connection Program 1200-5-1-.17(6)	(3-9)		
H.	Unaccounted Water Loss	(0)	Narrative	

Deficiency Subtotal
Total Deficiency Points
Overall Rating
Inspector's Signature _____

Additional Comments/Explanation: