Directed Assistance Module 3 (DAM3):

Completing the Surface Water Monthly Operating Report (SWMOR) Using the Automated Reporting Form

Course Description and Student Guide

Prepared by:
Texas Commission on Environmental Quality
Texas Optimization Program Core Team

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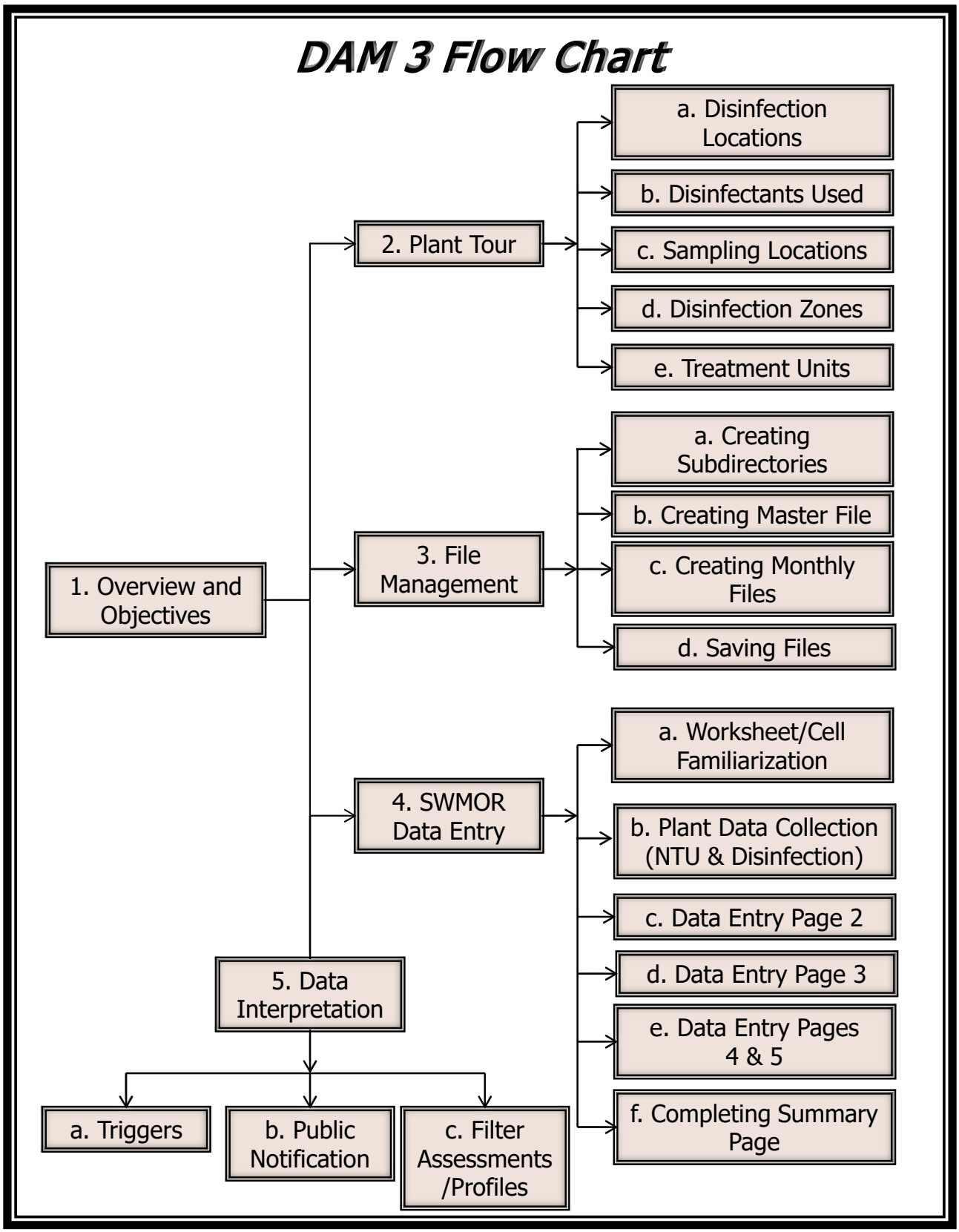
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COURSE DESCRIPTION AND STUDENT GUIDE

Directed Assistance Module (DAM) No. 3:
COMPLETING THE SURFACE WATER MONTHLY OPERATING REPORT (SWMOR) USING THE AUTOMATED REPORTING FORM

Background: The TCEQ helps public water systems produce safe water and comply with the regulations of 30 TAC 290 by providing financial, managerial, and technical (FMT) assistance. One manner in which the TCEQ provides this FMT assistance is through Directed Assistance Modules (DAMs). As of July 2013, the Texas Rural Water Authoriy is under contract to the TCEQ to provide on-site DAM training for no cost to the public water system. The FMT contract is administered by the TCEQ's Water Supply Division, which can be contacted at 512-239-4691, or by mail at:

TCEQ Water Supply Division, MC 159

PO Box 13087

Austin, Texas 78711

COURSE SUMMARY

A. Objectives:

The purpose of this DAM is to assist surface water treatment plant operators and other staff to:

1. Establish an effective electronic file management system for their plant's treatment data;
2. Customize the SWMOR for their plant's specific treatment regime;
3. Save and protect the integrity of their customized SWMOR;
4. Create monthly files;
5. Enter daily data;
6. Print and submit the completed SWMOR;

7. Determine if their treatment plant is in compliance with relevant TCEQ/EPA surface water treatment rules;
8. Describe treatment outcomes which require customer and TCEQ notification; and
9. Describe treatment outcomes which require plant staff to perform filter assessments and profiles.

B. Expertise Required:

1. Instructor:

The TOP CT and TOP AC have a quality control program to ensure that the instructors providing this training are capable of completing all of the training objectives.

2. Plant Staff:

The plant staff attending this course should:

a. Be familiar with the general principles of turbidity, disinfection measurement/monitoring, and the treatment regime implemented at their plant;
b. Have a general understanding of TCEQ turbidity and disinfection reporting requirements;
c. Be familiar with the general principles of flow and detention time; and
d. Have at least a very basic ability to use computers and to use Microsoft Excel® electronic spreadsheets.

Important:

The participant should already hold a surface water operator's license or at least have a basic knowledge of surface water treatment plant operations.

C. Instructional Materials Required:

You have been provided with the following instructional materials:

1. Completion documentation:

a. Participant Sign Up Sheet; and

b. DAM 3 Completion Form.

2. Training materials :

a. DAM 3 Student Guide;

b. Most current version of the Regulatory Guidance -211 Monthly Testing and Reporting at Surface Water Treatment Plants (RG 211);

c. Plant questionnaire;

d. Course Completion Certificate;

e. Six days of treatment data (refer to table 1) to be populated into the SWMOR;

f. Facility schematic from the plant's most current monitoring plan;

g. Most current TCEQ approved CT study and CT study approval letter for the plant;

h. Clip board

i. Mechanical pencil

3. A DAM 3 CD including:

a. An electronic copy of all the DAM 3 handout files;

b. Electronic copies of the most current versions of the SWMOR spreadsheet (TCEQ Forms 0102C, 0102D, and 0103) and RG-211; and

c. An electronic copy of the DAM 3 Instructor and Student Guide.

4. Multimedia/Electronic Training Equipment to use during the training, including a:

a. Computer/s with Microsoft Excel® 2003, 2007 or 2010 installed;

b. Printer;

c. Projector; and

d. Portable projection screen.

Important:

Prior to conducting the training, the public water system must locate and provide the instructor the documents in **Table 1**.

Table 1: Materials and Equipment Provided by the System

Quantity	Items
Copy for each Student	Most current TCEQ-approved CT study and CT study approval letter
Copy for each Student	Most current facility schematic in the plant's monitoring plan
Copy for each Student	Six days of the most recent daily operating and monitoring reports include: raw water pumpage data, raw water flow data, raw water turbidity and alkalinity data, settled water turbidity data, finished water/combined filter effluent (CFE) turbidity data, individual filter effluent (IFE) turbidity data finished water disinfectant residual data, and data establishing when the filters were on, off, backwashed and filtered-to-waste.
One Copy	Most current Monitoring Plan with the correct connection count and population served by the facility.

D. Deliverables:

To demonstrate that this activity has been completed, the instructor must maintain and submit copies of the following documentation to the TCEQ:

1. the completed DAM 3 Project Completion Form (Instructor's Guide);
2. a customized and partially completed SWMOR for the plant;
3. the completed DAM Evaluation from each participant (Attachment 7); and
4. the completed Participant Sign Up Sheet (Instructor's Guide).

Therefore, in order to get credit for the training, the student is requested to provide the instructor with assistance completing and submitting these forms.

E. Agenda

Table 2: Summary of the Proposed Agenda for DAM 3

8:00	Introductions and overview (10 minutes)
8:10	Records review and plant tour (30 minutes)
8:40	Electronic File Management (15 minutes)
8:55	Creating the Master SWMOR File (30 minutes) (RG-211 Section 2.1 and 2.2)
9:25	Creating the monthly SWMOR form (15 minutes) (RG-211 Section 2.3)
9:40	Break (15 minutes)
9:55	Elements of the SWMOR file (30 minutes) (RG-211 Chapter 1 and 2)
10:25	Data Entry - Page 2 of the SWMOR (40 minutes) (RG-211 Section 3.1)
11:05	Data Entry - Page 3 of the SWMOR (40 minutes) (RG-211 Section 3.2)
11:45	Lunch (60 minutes)
12:45	Data Entry - Pages 4 and 5 of the SWMOR (40 minutes) (RG-211 Section 3.3)
1:25	Completing the Summary Page (Page 1) and Completion of the Monthly SWMOR (40 minutes) (RG-211 Section 3.5)
2:05	Determining Compliance and Triggered actions (30 minutes) (RG-211 Sections 3.2 and 3.6)
2:35	Break (10 minutes)
2:45	Introduction to Public Notification (30 minutes) (RG-211 Chapter 8)
3:15	Introduction to the Filter Profile and Filter Assessment Reports (30 minutes) (RG-211 Chapters 4 & 5)
3:45	Questions and Answers (15 minutes)
4:00	Questionnaire (15 minutes)

4:15	Adjourn

DESCRIPTION OF ACTIVITIES

Introductions and Overview (8:00 – 8:10, 10 minutes)

During this section of the training the instructor will give a brief introduction and overview of DAM 3 and pass out class materials. You should:

1. Discuss and understand your learning objectives.
2. Sign the Participant Sign Up Sheet provided by the instructor.
3. Make sure you have all the student materials in **Table 1** and paragraph **C2**.

Plant Tour (8:10 – 8:40, 30 minutes)

During this section you will identify and confirm the plant's current disinfection and treatment regime.

Recommendation:

If the plant's disinfection strategy and plant are complicated, the public water system may request two FMT assistance visits. On the first visit, the instructor and a knowledgeable member of the plant staff would do a preliminary walk through the day prior to the training session, documenting any discrepancies between the CT study, plant schematic, and the current treatment regime at the plant. Then, on the second assistance visit, DAM 3 instruction would be performed.

1. You and the instructor will review and discuss the plant's CT study approval letter and monitoring plan schematic. If plant staff other than the Student can help understand the plant's monitoring strategy, for example the plant's engineer, they can be asked to participate.
2. On the plant tour, you should carry a clip board with the most current copy of the plant's CT study, monitoring plan schematic, and a writing tool.
3. During the plant tour, you should update, correct, and document new information on your copy of the schematic and CT study:
    a. the number of disinfectant injection points and their locations;
    b. the type of disinfectant fed at each injection point;
    c. the locations where disinfectant residual samples are taken;
    d. the number of disinfection zones and trains; and
    e. the number of treatment units per disinfection zone such as clarifiers, filters, storage tanks, etc.

Important:

Look for discrepancies between what you observe during the plant tour and what is found in the plant's CT study and monitoring plan schematic.

Electronic File Management (8:40 – 8:55, 15 minutes)

During this section you will learn helpful file management techniques.

1. Open your copy of RG-211 to Chapter 2, sections 2.1 and 2.2.
2. This section of RG 211 explains the importance of proper file management and backing up electronic files using a CD, portable storage device, or some other tool for archiving data. If you decide not to use one of these backup or archiving techniques, you must--at a minimum--print out and maintain hard copies of your SWMORs.
3. Look at the example in Figure 2.1 on page 2-1 of RG-211 This can help you decide how to organize your files.

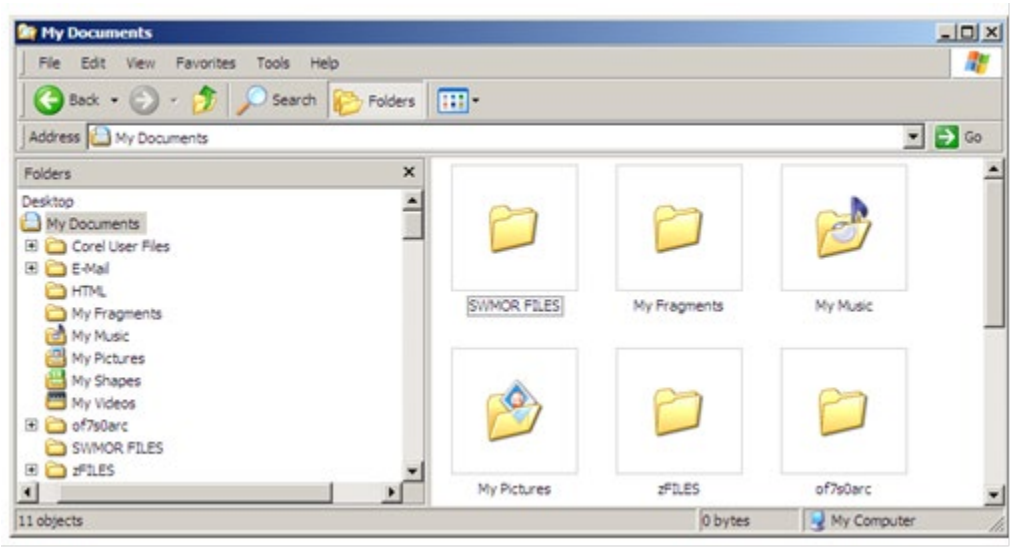


Figure 2.1 in RG-211 (Sample File Structure)

4. Create a SWMOR Files directory (also called a folder) and subdirectories for the Master File and Monthly Files, etc. You can also save the SWMOR Files directory to the computer's desktop so you will have a quick link for easy access.
5. Once the directories and subdirectories have been made, load the DAM 3 training CD and save its contents to the SWMOR Files directory.
6. Make sure that the Analysis Toolpak and Analysis Toolpac-VBA Add-ins have been installed.
7. Set your security levels for Macros and Active-X commands and add the appropriate folders to the trusted locations.

Did you know…

The TCEQ requires that public water systems retain copies of their SWMORs for a period of 10 years.

Creating a SWMOR Master File (8:55 – 9:25, 30 minutes)

This section of the training will assist you in creating a customized **Master SWMOR** file.

1. Use the copy of the plant schematic and CT study with the updates that you jotted down during the plant tour.

2. Open the folder labeled SWMOR Files. You made a shortcut to that folder during the file management section of this training. You will use the SWMOR file that you downloaded and saved from the training CD to create your plant's customized **Master SWMOR** file.

3. Once the file is located and opened, you will customize your **Master SWMOR** file:

   a. Enable macros for the spreadsheet, if necessary. This will only be required if you decide not to add the SWMOR folder(s) to trusted locations. Enabling macros means that you allow the file to do automatic calculations that are programmed in Excel.

   b. Populate the "Plant Parameters" dialog box. Refer to the plant's most current CT study approval letter--specifically, the attached facility schematic and T10-detail worksheets. Discuss discrepancies between the plant's CT study and current treatment. Be aware that if the current disinfection protocol differs from the approved CT study, the plant may need a new CT study. The instructor will document that a new CT study is needed. You may request a follow up FMT assistance visit to get help creating a new CT study.

Recommendation:

If you are using the SWMOR, we recommend that you save the customized file using the following file name:

SWMOR_Master_PWSIDNumber_PlantName

If you are using the SWMOR2, we recommend that you save the customized file using the following file name:

SWMOR2_Master_PWSIDNumber_PlantName

In each case, PWSIDNumber is the PWS ID of your system and PlantName is the name of your plant.

c. Populate the "Disinfection Process Parameter" dialog box. You are encouraged to continually refer to your CT study approval letter, specifically, the disinfection parameters summary attached to the study. Discuss discrepancies between the plant's CT study and the current treatment regime with the instructor if any were identified during the plant tour.

Important:

You should understand the importance of the "saving as" function in Excel®.

It is important *not* to enter data directly into the Master File, but into a Monthly SWMOR file saved from it.

If you overwrite the Master File you may have file corruption and or file loss.

4. Populate the heading of page 2 of the SWMOR with the appropriate information.

5. Properly label and save the file in the appropriate folder. Refer to section 2.4 of RG-211 for labeling suggestions. Save the file in the subdirectory labeled Master File for future integrity protection.

Note:

Certain cells are locked to avoid corrupting the worksheet formulas. Unlocked cells allow you to enter data in those locked cells by using "macros" or minicomputer programs embedded in Excel. For example, the population affects the number of readings required; the date affects the number of days in the month.

Creating the Monthly SWMOR Form (9:25 – 9:40, 15 minutes)

During this section of the training you will create your **Monthly SWMOR** files.

1. Open RG-211 to Chapter 2, section 2.5.
2. Reload the plant's Master File that you created and saved during the previous session.
3. When the Master File is opened, the instructor will assist you as you create a working copy of their Monthly SWMOR following these steps:
    a. Enabling Macros; and
    b. Cancelling Dialogue Boxes
4. Instructor will assist as you save the file as a working Monthly SWMOR File into the subdirectory created for monthly reports during the file management session.

Important:

You should understand the importance of the "saving as" function in Excel®. It is important not to enter data directly into the Master File, but into Monthly SWMOR files saved from it. If you overwrite the Master File you may have file corruption and or file loss.

Break (9:40 – 9:55, 15 minutes)

Elements of the SWMOR File (9:55 – 10:25, 30 minutes)

Open your copy of RG-211 to Chapter 1. This section will reinforce the following elements:

1. cell and worksheet concepts;
2. drop-down menus;
3. locked and unlocked cells;
4. worksheet tabs; and
5. special functions such as "paste special", "values", the "Circle Errors" and "Erase Circle" buttons.

Note:

Certain cells are locked to avoid corrupting the worksheet formulas. Unlocked cells allow you to enter data in those locked cells using by "macros" or mini-computer programs embedded in Excel. For example, the population affects the number of readings required; the date affects the number of days in the month.

Data Entry into the Page 2 of the SWMOR
(10:25 – 11:05, 40 minutes)

Note:

Before data entry begins, reload your copy of the monthly SWMOR file that you copied from the Master Copy in an earlier session. Remember the importance of choosing "cancel" for the plant and disinfection process parameters dialog boxes. When the monthly SWMOR is loaded and the dialog boxes cancelled, the spreadsheet will automatically park on **page 2** of the SWMOR labeled "Turbidity Data".

Refer to Section 3.1 of RG-211 and the supplemental flow charts in **Attachments 1, 2, 3, and 4.** Also, refer to copies of the daily plant data from the introduction section of this training.

Specifically, you should organize the following daily data to be populated into **page 2** of the SWMOR:

a. Raw water pumpage (MGD);

b. Treated water pumpage;

c. Raw water turbidity and alkalinity;

d. Settled water turbidity (if required);

e. Finished water combined filter effluent (CFE) turbidity data; and

f. Finished water disinfectant residual data.

Raw Water Pumpage (MGD) –

The totalized volume of untreated water pumped to the plant for treatment each day.

Review the flow chart labeled **Attachment 1**, Reporting Raw/Treated Water Pumpage, with special attention on the following points:

a. Raw water pumpage may not be exactly the same as the treated water pumped to distribution. There are times when the plant is not treating water, but pumping it from storage to the distribution system and other times when the plant is treating water, but not pumping it to the distribution system.

b. Do not record the instantaneous flow reading on the flow meter but rather the totalized volume that has been pumped to the distribution system on a daily basis.

c. If the treatment plant does not pump raw water on a given day, you should enter <0.000> in the appropriate column.

d. If the treatment plant received raw water on a specific day and plant staff failed to record the data, then <ND> should be entered in the appropriate column.

Treated Water Pumpage (MGD) –

The totalized volume of water that is pumped to the distribution per day; water that has passed through all treatment units.

Continue to use **Attachment 1**, Reporting Raw/Treated Water Pumpage, with attention to the following:

a. Do not record the instantaneous flow reading on the flow meter but rather the totalized volume that has been pumped to the distribution system on a daily basis.

b. If the plant doesn't send treated water to the distribution on a given day, you should enter <0.000> in the appropriate column.

c. If treated water was pumped to the distribution system and the plant staff failed to record the amount then you should enter <ND>.

Raw Water Turbidity and Alkalinity –

Turbidity reported in NTU and alkalinity reported in mg/l of $CaCO_3$ of the raw water pumped to the treatment plant.

Use **Attachment 2**, Reporting Raw and Settled Water Analysis Note the following:

a. If raw water was not pumped to the treatment plant for the day then you should enter <X>.

b. If raw water was pumped to the treatment plant and the plant staff failed to conduct raw water analysis test, then you should enter <ND>.

c. If more than one set of tests are conducted per day, then you must report the average.

Settled Water Turbidity (NTU) –

Turbidity reported in NTU of the water exiting the sedimentation basin before passing through the filters.

Follow **Attachment 2**, Reporting Raw and Settled Water Analysis. Note the following:

a. Not all treatment plants are required to monitor and report settled water turbidity. However, it is recommended for evaluating the performance of sedimentation basins.

b. Applicability and monitoring frequency can be found in the most current plant CT study approval letter.

c. If multiple tests are run throughout the day, then you must report the highest value.

d. If the sedimentation basin is not in operation on a given day, then you should enter <X>.

e. If the sedimentation basin is in operation but plant staff fails to collect data, then you should enter <ND>.

Finished Water Turbidity/Combined Filter Effluent (CFE) -

Turbidity reported in NTU of the comingled or combined filter effluent.

Follow **Attachment 3**, Reporting Finished Water Combined Filter Effluent (CFE). Note:

a. Recording frequency and timing are dependent upon the population served by the treatment plant. Plants serving less than or equal to 500, must take one reading per day at the same time of the day. Plants serving more than 500people must take readings every four hours that the plant is in operation.

b. Plants must have TCEQ approval for sample locations that are not on the clearwell fill line.

c. You must report the turbidity of the combined filter effluent when the raw water pumpage is above <0.000> MGD.

d. If the treatment plant is off line during the entire 4-hr period you should enter <X> in the corresponding column.

e. If the treatment plant treated water for any time during the 4-hr period and plant staff failed to monitor and record a reading during that block of time then the you should enter <ND>.

Finished Water Disinfection Data –

The lowest reported disinfection residual of the water leaving the treatment plant after having passed through all treatment units.

Use **Attachment 4**, Reporting Lowest Residual. Note:

a. Samples must be collected from a location representative of water entering the distribution system. This must be an approved entry point sample site. Approved entry points are shown in Drinking Water Watch.

b. The timing and frequency of finished water disinfection readings that must be reported depends on the number of people that the water system serves. Systems serving more than 3,300 people must monitor and record disinfection residuals continuously, recording sample results at least once every 30 minutes, and systems serving 3,300 or fewer people may take grab samples daily at the same time(s) each day.

Grab Sample Guidance

Population	**Number of disinfectant samples required – Water entering the distribution system**
500 or Fewer	1 Sample per Day
501 – 1,000	2 Samples per Day
1,001 – 2,500	3 Samples per Day
2,501 – 3,300	4 Samples per Day

c. If the treatment plant did not pump finished water to the distribution the entire day, then you should record <X> in the corresponding cell.

d. If the treatment plant pumped finished water to the distribution system for any time but plant staff failed to collect and record a disinfectant residual, then you should enter <ND> into the corresponding cell.

e. If some--but not all--of the disinfectant residuals were recorded and the residual fell below the regulatory requirements (0.2 mg/L free or 0.5 mg/L total) then you report the lowest residual and report the amount of time in hours that the residual was below the minimum standard.

f. If some--but not all--of the disinfectant residuals were recorded and the residual never fell below the regulatory requirements (0.2 mg/L free or 0.5 mg/L total) then you report <MD> in the appropriate cell.

Did you know…

Treatment plants serving more than 3,300 people, and who are required to monitor and record the disinfectant leaving their treatment plant on a continuous basis, are allowed to collect "grab samples" every 4-hrs for no more than 5 working days should they experience failure in their continuous monitoring equipment.

Data Entry into the Page 3 of the SWMOR (11:05 – 11:45, 40 minutes)

Refer to Section 3.2 of RG-211 and the supplemental flow chart in **Attachment 4.** Refer to the daily plant data from the introduction section of this training.

Specifically, you should organize the following daily data to be populated into **page 3** of the SWMOR:

a. Individual filter turbidity data; and

b. Data establishing when the filters were turned on, turned off, backwashed and filter-to-waste.

Individual Filter Effluent Turbidity (NTU) –

The effluent turbidity produced by an individual filter.

Refer to **Attachment 5**, Reporting Individual Filter Effluent (IFE) Turbidity. Note:

a. The turbidity of the individual filters must be monitored and recorded at least once every 15-minutes that the filter is sending water to the clearwell.

b. Systems serving ≥ 10,000 population must monitor and record the turbidity of an individual filter 4-hrs after it has been backwashed or has been brought back online after being idle.

c. IFE samples are not required when a filter is being backwashed, filtering to waste or is idle. The plant should clearly document the off-line periods in the plant log book.

d. If a filter doesn't send water to the clearwell, plant staff should enter <X> in the appropriate column.

e. If plant staff monitored and recorded all required IFE samples when filters were sending water to the clearwell, then you should report the highest confirmed reading in the appropriate column.

f. If plant staff monitored and recorded some--but not all--of the IFE samples and the samples were ≤ 1.0 NTU (15-minute) and ≤ 0.5 NTU (4-hr after backwash or coming back online) then you should enter <MD>.

g. If plant staff failed to collect samples or collected some of the samples but the ones collected were all > 1.0 NTU (15-minute) and > 0.5 NTU (4-hrs

after backwashing or coming back online) then you should enter the lowest confirmed turbidity reading for the day.

Important:

You need to understand what "data confirmation" means:

Routine 15-mininute IFE data exceeding 1.0 NTU must be "confirmed" in two consecutive 15-minute data points.

Also, for systems serving ≥ 10,000 population, 4-hr readings exceeding 0.5 NTU must be "confirmed" with a consecutive reading above 0.5 NTU 15-minutes later.

Break for Lunch (11:45 – 12:45, 60 minutes)

Data Entry - Pages 4 and 5 of the SWMOR (12:45 – 1:25, 40 minutes)

Refer to Section 3.3 of the plant's copy of RG-211 and the supplemental flow charts in **Attachment 5**. Also, refer to the daily plant data from the introduction section of this training.

Specifically, you should organize the following daily data to be populated into **pages 4 & 5** of the SWMOR:

a. Daily disinfection data for each zone; and

b. Flow data for each disinfection zone.

Disinfection Performance Data –

Data that is integral to calculating the plant's inactivation efficiency regarding *Giardia* and viruses.

<u>This section covers the flow chart labeled **Attachment 6**, Reporting Disinfection Performance Data, with emphasis on the following points:</u>

a. The effectiveness of the disinfection process must be monitored at least once per day when the plant records any raw water pumpage > 0.000 MGD.

b. Disinfection zone samples must be collected at the end of each disinfection zone.

c. Samples must be collected during the peak hourly flow rate for the day. If the flow is reduced there is no need to re-collect the sample. However, if the flow is increased during the day, you must re-collect the sample.

d. <u>The flow rate that you enter on pages 4 & 5 is the instantaneous flow rate going through each disinfection zone at the time the samples are taken.</u> A common error is for plant staff to enter the raw water pumpage for the day. Unless your plant operates at a constant production rate for an entire 24-hr day, the daily raw water flow reported on page 2 will not match the flow rate shown on pages 4 & 5 for that day.

e. If the plant staff enters a raw water pumpage of 0.000 MGD on page 2 of the SWMOR, macros will automatically populate pages 4 & 5 with <NA> for the disinfection zones.

f. If you collect more than one set of disinfection zone samples, you must report the set that gives the plant the lowest inactivation credit for *Giardia* and

viruses. *CAUTION! YOU MUST NOT USE A COMBINATION OR MIXTURE OF SAMPLE SETS.*

g. If the plant staff fail to collect samples for the disinfection zones, you must report <ND> in the appropriate cell(s) associated with the missing data point(s).

h. Be careful not to falsify data: Know how to copy the disinfectant information from one day to another without overwriting the spreadsheet macros.

Note: the following are common issues for pages 4 & 5 of the SWMOR:

1. The log inactivation number on pages 4 & 5 must be entered so the macros in the spreadsheet will properly compute the inactivation ratios;

2. The proper disinfectant must be selected from the disinfection drop down box;

3. The correct "Flow" must be entered on pages 4 & 5. This is the instantaneous flow recorded in the disinfection zone when the samples are collected;

4. <NA> is not acceptable for the average log inactivation for *Giardia* and viruses;

5. If the inactivation ratio number is too large for the cell and the spreadsheet shows "###", enter "1000" in the inactivation ratio box.

Important:

An increased frequency of disinfection zones samples is required when the plant is less than an inactivation ratio of 1.00. Specifically, plant staff are required to increase sampling frequency to every 4-hrs until the inactivation ratio is 1.00 or more.

Completing the Summary Page (1:25 – 2:05, 40 minutes)

This section of the training uses lecture and demonstration methods to help you enter data into **page 1**, the summary page of the SWMOR. The training is in three parts.

1. Treatment Plant Performance
2. Distribution System
3. Public Notification

Refer to Section 3.5 of RG-211.

Treatment Plant Performance –

"Treatment Plant Performance" is the top section on **page 1**, sectioned with double lines, which is a summary of the turbidity data, CT data, and the disinfectant entering the distribution system. The spreadsheet automatically populates most of the questions using the information that was entered on **page 2** of the SWMOR.

However, some portions must be populated by plant staff:

a. The first block in this section that requires you to make an entry in the "maximum allowable turbidity level." You must use the drop-down box to select the maximum allowable turbidity level for finished water. The rest of the blocks concerning combined water quality are automatically calculated or answered by the SWMOR.

b. You must then indicate whether the results of any special studies conducted on one or more filters are being submitted with the SWMOR. This is done by clicking on the button for any additional reports being submitted. If no reports are submitted, then you will select "None."

c. You must also select the minimum disinfectant residual leaving the plant by using the drop-down menu.

Distribution System –

"Distribution System" is the middle section on **page 1** which summarizes the disinfection data for the plant and distribution system. You will have to populate most of this section because this is the only area on the SWMOR where distribution sample information is required.

You must populate the following information:

a. Enter the total number of disinfectant residuals that were taken in the distribution system. You should enter <0> if no samples were taken in the distribution and <ND> if samples were required but not taken.

b. Enter the average disinfectant residual. If the total number of readings for the month is <0> you should enter <NA>. If the total number of readings for the month is <ND>, you should enter <ND> here, also.

c. Enter the total number of samples that were below the minimum required disinfection residual. If the total number of readings for the month is <0> or <ND>, plant staff should enter <NA> or <ND>, respectively.

d. Enter the number of readings with no detectable residual. If the total number of readings for the month is <0> or <ND>, plant staff should enter <NA> or <ND>, respectively.

e. Enter the percentage of readings with a low residual last month. you get this information from Box 6A of the plant's SWMOR for the preceding month.

Public Notification –

"Public Notification" is the last box on **page 1** which is a summary of the plant's treatment technique or monitoring/reporting violations that occurred for the month. If violations did occur for which further action is required, they will appear in bold red letters.

The training will emphasize the following information:

a. The SWMOR will automatically determine whether the plant has violated any of the treatment technique or monitoring and reporting requirements that require public notification.

b. The spreadsheet cannot complete this portion of the SWMOR unless all the data has been entered. Often, it is the failure to complete the "Summary and Compliance" section of **page 3** of the SWMOR which is the culprit.

   Remember--you can use the "circle" button to identify empty cells.

c. If any additional reporting for individual filter monitoring or special studies is required—such as filter profiles, filter assessments, or Comprehensive

Performance Evaluations (CPE)—it will be documented in the "Additional Reports and Worksheets" section.

d. You must populate the Public Notices table in the "Summary Page Addendum" with the dates when the TCEQ and the plant's customers were notified of violations.

Completing **page 1** of the SWMOR concludes the data entry portion of the SWMOR. You should complete the following before submitting your SWMOR:

a. You should check each page of the SWMOR using the "circle" button to identify missing data;

b. You should review the SWMOR in detail to ensure that no numbers have been transposed during data entry;

c. The responsible certified operator must sign and date all pages of the SWMOR; and

d. The report must be printed out and mailed along with any related documents to the TCEQ. Faxed copies of the SWMOR are not acceptable because when they are faxed, the font is too small to be legible and it is extremely difficult to read the numbers.

Determining Compliance/Triggered Actions
(2:05 – 2:35, 30 minutes)

This section of the training uses lecture and demonstration methods to help you understand the interpretation of compliance/non-compliance and certain actions that may be triggered.

There are two general types of violations:

1. Treatment Technique Violations; and
2. Monitoring and Reporting Violations

Treatment-technique violations

Treatment technique violations are the more severe of the two, because they reflect that your plant failed to meet at least one of the minimum treatment requirements during the reporting period. As a result, your plant may have exposed your customers to contaminated water. Figure 3.28 shows the area for reporting treatment technique violations.

Monitoring-and-reporting violations

Monitoring and reporting violations are significant because they indicate that the operators failed to run all of the tests needed to detect treatment-technique problems. As a result, there were periods of time when the operators--and the TCEQ--could not determine that the water being produced met all of the treatment requirements.

Refer to **Section 3.6** of RG-211. Open the "**P.1 Summary**" tab of the SWMOR, focus on the "Additional Reports and Worksheets" and "Public Notices" of the Summary Page Addendum.

The SWMOR will automatically tell you if one or more violations occurred during the reporting period and will appear in the "Summary Page Addendum" on **page 1** of the SWMOR.

There are **6** treatment technique and **10** monitoring and reporting violations as follows:

1. Treatment Technique Violations:

a. Were more than 5% of the turbidity readings above the acceptable level? This question corresponds to the finished water/CFE turbidity calculations found in the "Treatment Plant Performance" box of the "Summary Page Addendum". At least 95% of the plant's turbidity readings must be ≤ 0.3 NTU. The public water system may receive a "Notice of Violation" and will be required to notify the TCEQ and the public if more than 5% of the samples exceed 0.3 NTU. The TCEQ requires that they be informed by the end of the next business day when the plant has exceeded 5%. You can call 512-239-4691 during business hours or email PDWS@tceq.texas.gov to notify the TCEQ.

Important:

Understand that readings from 0.301 to 0.349 are rounded down to 0.3 and that readings from 0.350 to 0.399 are rounded up to 0.4. Consequently, a reading is not counted as above 0.3 NTU unless a value of 0.350 NTU or above is entered.

b. Were there any days with turbidity readings above 1.0 NTU? This question corresponds to the finished water/CFE turbidity calculations found in the "Treatment Plant Performance" box of the "Summary Page Addendum". The plant is required to notify the TCEQ within "24 hours" of becoming aware of turbidity readings > 1.0 NTU. This consultation allows for the TCEQ to determine if the violation poses an "Acute Threat" to public health.

c. Were there any days with turbidity readings above 5.0 NTU? This question corresponds to the finished water/CFE turbidity calculations found in the "Treatment Plant Performance" box of the "Summary Page Addendum". The plant is required to notify its customers with a "Boil Water Notice" within "24 hours" of becoming aware of a turbidity reading > 5.0 NTU. The TCEQ must be notified within "24 hours" as well, but you should not wait till after you speak with the TCEQ ensure the health of your customers.

d. Were there any periods when the plant failed to meet the CT requirements for more than 4 consecutive hours? This question corresponds to the plant's summary of calculated inactivation ratios for *Giardia* and viruses found in the "Treatment Plant Performance" box of the

"Summary Page Addendum". The plant is required to notify the TCEQ by 5 p.m. on the next business day after the violation occurred. If it is possible to consult with the TCEQ within 24 hours, this consultation allows for the TCEQ to determine if the violation poses an "Acute Threat" to public health. If you cannot consult with the TCEQ, the public notice must be done as if it is an acute threat.

e. Were there any periods when the disinfectant residuals leaving the plant fell below the acceptable level for more than 4 consecutive hours? This question corresponds to the summary of the plant's disinfectant residuals found in the "Treatment Plant Performance" box of the "Summary Page Addendum". The plant is required to notify the TCEQ by 5 p.m. on the next business day after the violation occurred. This consultation allows for the TCEQ to determine if the violation poses an "Acute Threat" to public health.

f. Were more than 5.0% of the residuals in the distribution system below the acceptable level for two months in a row? This question corresponds to the summary of the plant's distribution disinfectant residuals found in the "Distribution" box of the "Summary Page Addendum". The plant is required to notify the TCEQ within 24 hours of becoming aware that more than 5% of their distribution residuals were below the acceptable value (0.2 mg/L free and 0.5 mg/L total).

2. Monitoring and Reporting (M&R) Violations:

In this section of the training, the instructor will briefly go through the list of monitoring and reporting violations that are found in the "Summary Page Addendum" on **page 1** of the SWMOR.

The TCEQ does not have to be notified of M&R violations; they will be notified when you submit your SWMOR.

Break (2:35 – 2:45, 10 minutes)

Introduction to Public Notice (2:45 – 3:15, 30 minutes)

During this section, the instructor will use lecture methods to help you understand public notification requirements. In this training you will answer three questions.

1. Which plant and distribution circumstances require notification of the TCEQ and the public?

2. When do you notify the TCEQ and the public?

3. How do you notify the TCEQ and the public?

Refer to **Chapter 8** of RG-211.

As mentioned in the previous section, treatment technique violations are the most severe and generally require a more expeditious and arduous TCEQ and public notification process. Treatment technique violations are further categorized into acute (those posing a high risk to public health) and non-acute (those posing a lower risk.) The severity of the treatment technique violation will dictate how and when plant staff will have to notify the TCEQ and their customers.

Which plant and distribution circumstances require TCEQ and public notification?

Ask plant staff to find tables 8.1 and 8.2 and follow along as you briefly discuss.

Treatment Technique Violations Summary (Table 8.1)

Type of Violation	Description of Violation
Daily turbidity (8.1, 8.5 and 8.6)	The turbidity level of the finished water (the CFE turbidity level) exceeds 1.0 NTU at any time during any day.
Daily CT (8.2 and 8.7)	Your plant fails to meet the inactivation requirements (for *Giardia* and viruses) for more than 4.0 consecutive hours.
Daily low residual (8.2 and 8.7)	The residual of the finished water entering the distribution system falls below acceptable levels for more than 4.0 consecutive hours.
Monthly turbidity (8.3 and 8.7)	For the month, more than 5.0% of the finished water (CFE) turbidity readings are above 0.3 NTU.
Monthly residual (8.3 and 8.7)	For the second month in a row, more than 5.0% of the residuals in the distribution system fall below the acceptable level.

Monitoring and Reporting Violations Summary (Table 8.2)

Type of Violation	Description of Violation
CFE turbidity reporting	The plant fails to report all of the required CFE turbidity readings.
Daily CT reporting	The plant fails to report all the CT data needed to evaluate microbial inactivation.
Disinfectant residual of finished water monitoring	The plant fails to properly monitor the disinfectant residual level of the finished water.
Disinfectant residual in distribution system	The plant fails to monitor or report the required number of measurements in the distribution system.
Maximum individual filter effluent turbidity	The plant fails to monitor or report the reading for daily maximum turbidity of individual filter effluent.
4-hour individual filter effluent turbidity	The plant fails to monitor or report one or more of the turbidity readings 4 hours after the start of a filter run.
Filter-profile report	The plant fails to submit a FPR when it is required.
Filter-assessment report	The plant fails to submit a FAR when it is required.
Comprehensive Performance Evaluation	The plant fails to submit a CPE-request form when it is required.

When to notify the TCEQ and customers?

As indicated by Table 8.1, treatment technique violations may occur on a daily or monthly basis. You should contact the TCEQ as soon as you become aware that one of the six treatment technique violations has occurred.

Why must you contact the TCEQ before issuing a notice to your customers? The TCEQ wants you to contact them first for the following reasons:

a. To verify whether a public notice is necessary;
b. To ensure that if the plant has to issue a notice that they have all the information and materials needed; and
c. To avoid questions from the press and customers before they have been told about the situation.

How to Notify for an Acute Treatment Technique Violations:

The TCEQ requires that the plant issue a notice to the public within 24 hours of becoming aware of an Acute Treatment Technique Violation. This can be done through the following media outlets:

a. Furnish a copy of the notice to the radio and television stations serving the area being serviced by the public water system.

b. Publish the notice in a daily general-circulation newspaper in the area served by the system.

c. If the area is not served by a daily general circulation newspaper, the notice must be delivered by hand or continuously posted in conspicuous places within the area served by the system. The notice must remain for at least seven days and for as long as the violation exists.

Important:

For the most health threatening acute treatment technique violations, the system should never wait for the TCEQ to respond before notifying their customers.

When and How to notify of a Non-Acute Treatment Technique Violations:

For non-acute treatment technique violations, the TCEQ requires that the plant issue a notice to the public within 30 days of becoming aware of the violation(s). This can be done through the following media outlets:

a. Mail a copy of the notice to each customer that receives a bill and to other service connections to which water is delivered by the public water system.

b. Publish the notice in a local paper.

c. Deliver multiple copies of the notice to customers that supply drinking water to others (e.g. apartments, mobile home parks)

d. Deliver the notice to community organizations.

e. Post the notice in conspicuous locations within the area.

Monitoring and Reporting Violations:

For monitoring and reporting violations, the TCEQ's notification occurs through submittal of the SWMOR.

The TCEQ recommends that the plant notify their customers of a monitoring and reporting violation as soon as possible. However, the initial notice is required to be issued no later than 90 days after the date that the violation(s) occurred.

The notification process is summarized as follows:

a. Notify the TCEQ of the violation.

b. Notify your customers of the violation.

c. Notify the TCEQ and your customers when the violation has ended.

d. Send the TCEQ proof that you notified your customers.

How does the plant notify the TCEQ and their customers?

Chapter 8 of the RG-211 includes sample notification letters and fax templates for notifying the TCEQ and the public.

Filter Profile and Filter Assessment Reports (3:15 – 3:45, 30 minutes)

During this section of the training, the instructor will utilize lecture methods to introduce you to filter profiles and assessments and the triggers that require you to perform them.

Refer to Chapters 4, 5, and 6 of RG-211. Example forms are found in **Appendix F** of RG-211.

The **Filter Profile Report** (FPR) – contains 3 sections as defined below:

Obvious Reasons –

This section describes how to identify an obvious reason for abnormal filter performance. A few examples from the list of obvious reasons are listed below:

a. Post backwash turbidity spike

b. Prolonged filter run time

c. Excessive filter loading rate

d. Air bubble in the turbidimeter

e. Malfunction of the coagulant feed pump

There are various other "obvious reasons" that have not been listed here that are on the FPR form (**Appendix F**). It is important to maintain accurate operator logs so that you can identify the root cause of periodic turbidity spikes. You will not be required to complete the "Filter Profile" and "Filter Profile Narrative" sections of the FPR if you can successfully identify and document an obvious reason for the abnormal filter performance.

Filter Profile –

The filter profile is a graph that shows the turbidity level of the water produced by an individual filter for an entire filter run and explains the cause of every event where consecutive turbidity readings change by more than 0.1 NTU. Filter profiles must be based on turbidity readings recorded at one-minute intervals over an entire filter run, from start up to backwash. The run length during this assessment should be representative of a typical filter run, and should include the period when another filter is being washed.

Filter Profile Narrative

The filter profile narrative is the explanation of what happened during the time period of the filter profile. Turbidity spikes recorded during the profile should be explained.

<u>You may have to perform a filter profile if:</u>

1. The individual filter effluent turbidity of any filter is greater than 1.0 NTU in two consecutive 15-minute readings; and

2. The system serves more than 10,000 people and monitors and records an individual filter effluent turbidity greater than 0.5 NTU in two consecutive 15-minute readings collected at the end of 4-hrs of continuous run time after the filter has been backwashed or put back online after being idle.

Mandatory Comprehensive Performance Evaluations (mCPE):

The plant will have to participate in a mandatory Comprehensive Performance Evaluation (mCPE) conducted by the TCEQ if it has IFE turbidity readings that exceed 2.0 NTU in two consecutive 15-minute readings for two consecutive months.

Important:

Since the requirement for an mCPE is based on confirmed turbidity readings, it is important to check the 15-minute reading after any spikes.

Questions and Answers (3:45 – 4:00, 15 minutes)

The instructor will give you the opportunity to ask questions throughout the day. If you have any unanswered questions, this is your opportunity to discuss them.

DAM Evaluation (4:00 – 4:15, 15 minutes)

The TCEQ and the TCEQ's Financial, Managerial, and Technical service-provider want to continually improve the training provided to public water systems--your input can help. Please fill out the DAM Evaluation Form and give your comments to the instructor, who will pass them on.

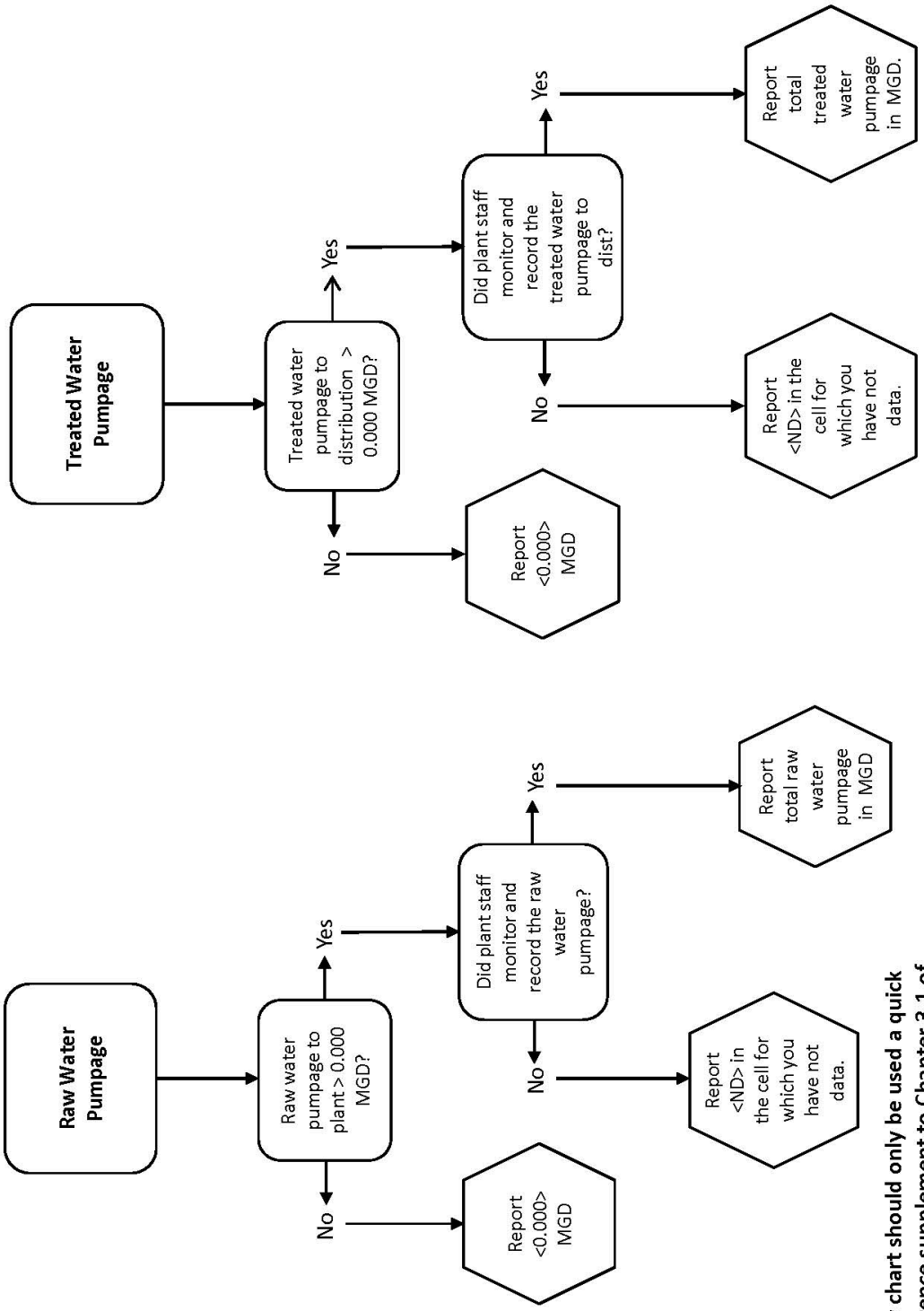
Adjourn (4:15)

ATTACHMENT 1.

FLOW CHART FOR REPORTING RAW/TREATED WATER PUMPAGE

Directed Assistance Module 3 (DAM 3)
Completing the Surface Water Monthly Operating Report
(SWMOR) Using the Automated Reporting Form

Flow Chart for Reporting Raw/Treated Water Pumpage



Flow chart should only be used a quick reference supplement to Chapter 3.1 of RG-211.

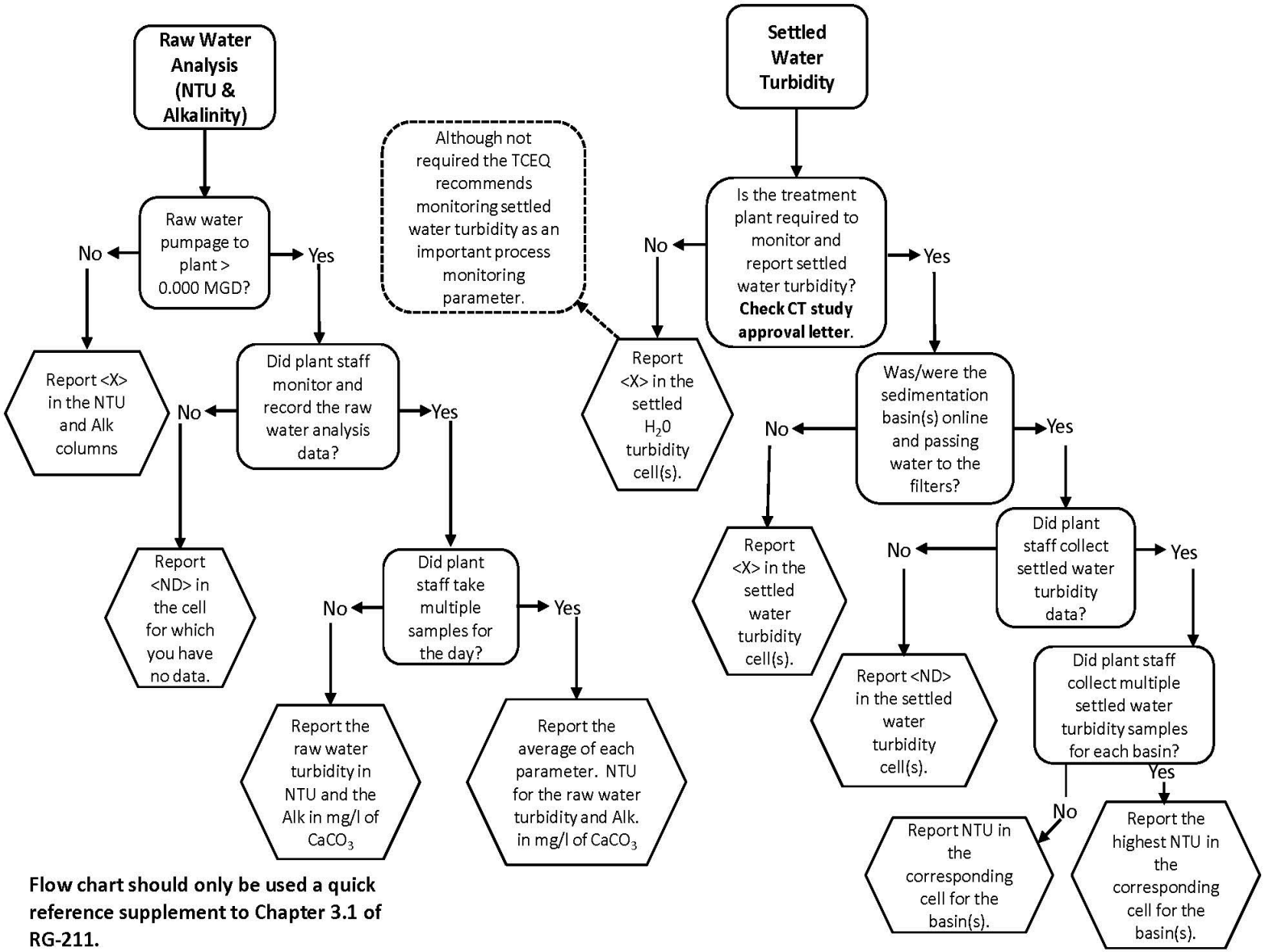
ATTACHMENT 2.

FLOW CHART FOR REPORTING RAW AND SETTLED WATER ANALYSIS

Assistance Module 3 (DAM 3)

Completing the Surface Water Monthly Operating Report (SWMOR) Using the Automated Reporting Form

Flow Chart for Reporting Raw and Settled Water Analysis



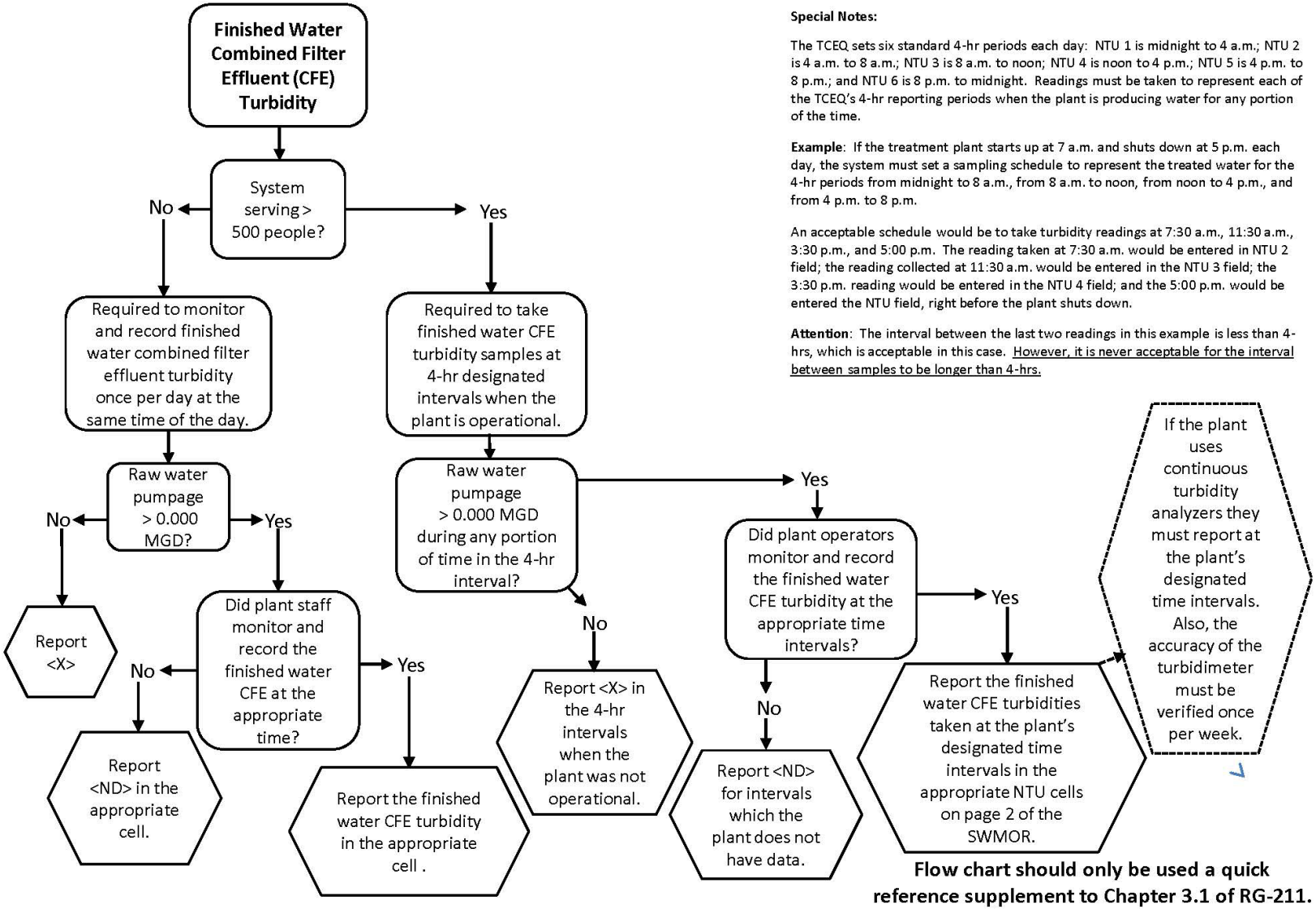
Flow chart should only be used a quick reference supplement to Chapter 3.1 of RG-211.

ATTACHMENT 3.

FLOW CHART FOR REPORTING FINISHED/COMBINED FILTER TURBIDITY EFFLUENT

Assistance Module 3 (DAM 3)
Completing the Surface Water Monthly Operating Report
(SWMOR) Using the Automated Reporting Form

Flow Chart for Reporting Finished/Combined Filter Turbidity Effluent



Special Notes:

The TCEQ sets six standard 4-hr periods each day: NTU 1 is midnight to 4 a.m.; NTU 2 is 4 a.m. to 8 a.m.; NTU 3 is 8 a.m. to noon; NTU 4 is noon to 4 p.m.; NTU 5 is 4 p.m. to 8 p.m.; and NTU 6 is 8 p.m. to midnight. Readings must be taken to represent each of the TCEQ's 4-hr reporting periods when the plant is producing water for any portion of the time.

Example: If the treatment plant starts up at 7 a.m. and shuts down at 5 p.m. each day, the system must set a sampling schedule to represent the treated water for the 4-hr periods from midnight to 8 a.m., from 8 a.m. to noon, from noon to 4 p.m., and from 4 p.m. to 8 p.m.

An acceptable schedule would be to take turbidity readings at 7:30 a.m., 11:30 a.m., 3:30 p.m., and 5:00 p.m. The reading taken at 7:30 a.m. would be entered in NTU 2 field; the reading collected at 11:30 a.m. would be entered in the NTU 3 field; the 3:30 p.m. reading would be entered in the NTU 4 field; and the 5:00 p.m. would be entered the NTU field, right before the plant shuts down.

Attention: The interval between the last two readings in this example is less than 4-hrs, which is acceptable in this case. <u>However, it is never acceptable for the interval between samples to be longer than 4-hrs.</u>

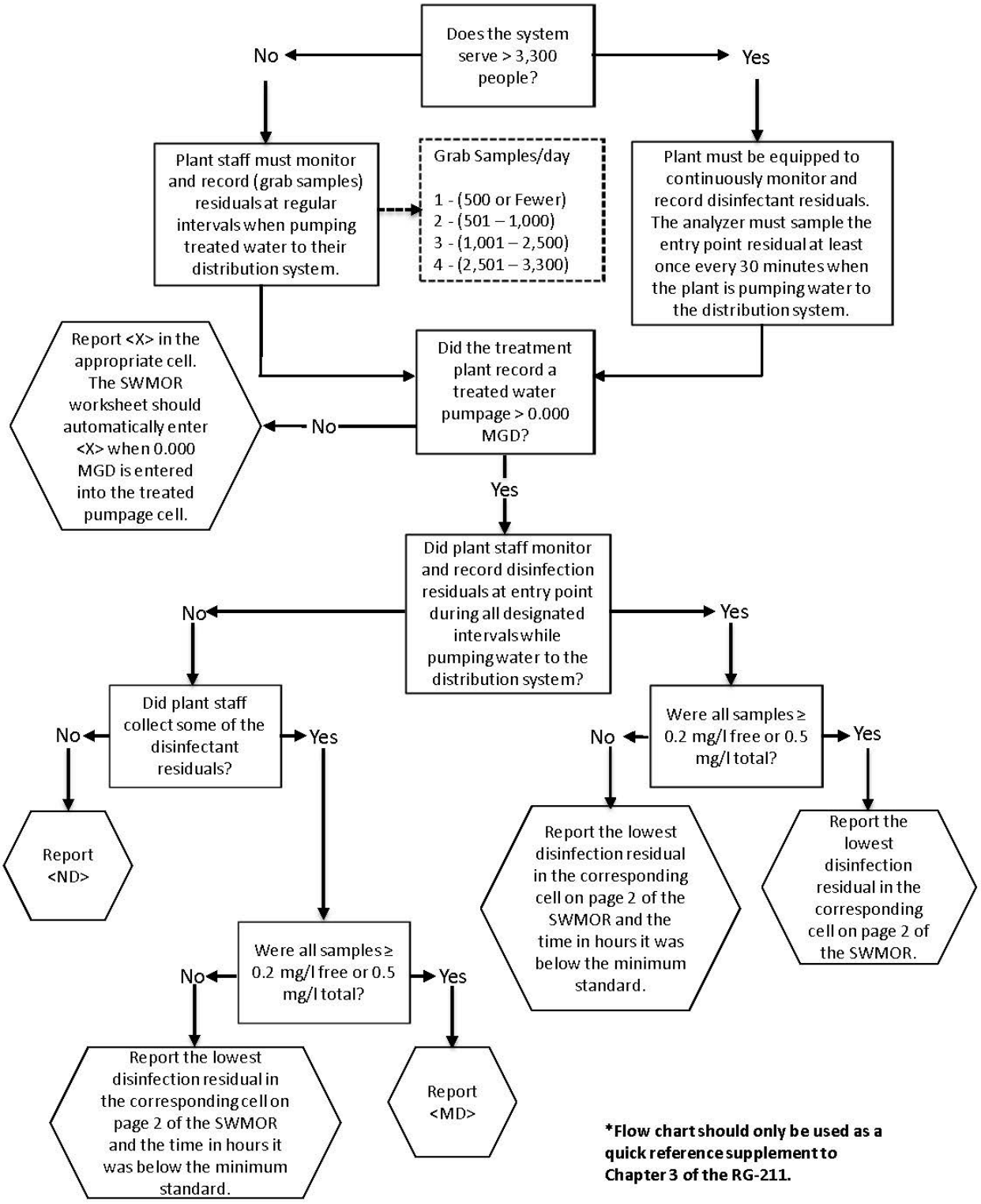
Flow chart should only be used a quick reference supplement to Chapter 3.1 of RG-211.

ATTACHMENT 4.

FLOW CHART FOR REPORTING LOWEST DISINFECTANT RESIDUAL

Assistance Module 3 (DAM 3)
Completing the Surface Water Monthly Operating Report (SWMOR) Using the Automated Reporting Form

Flow Chart for Reporting Lowest Disinfectant Residual



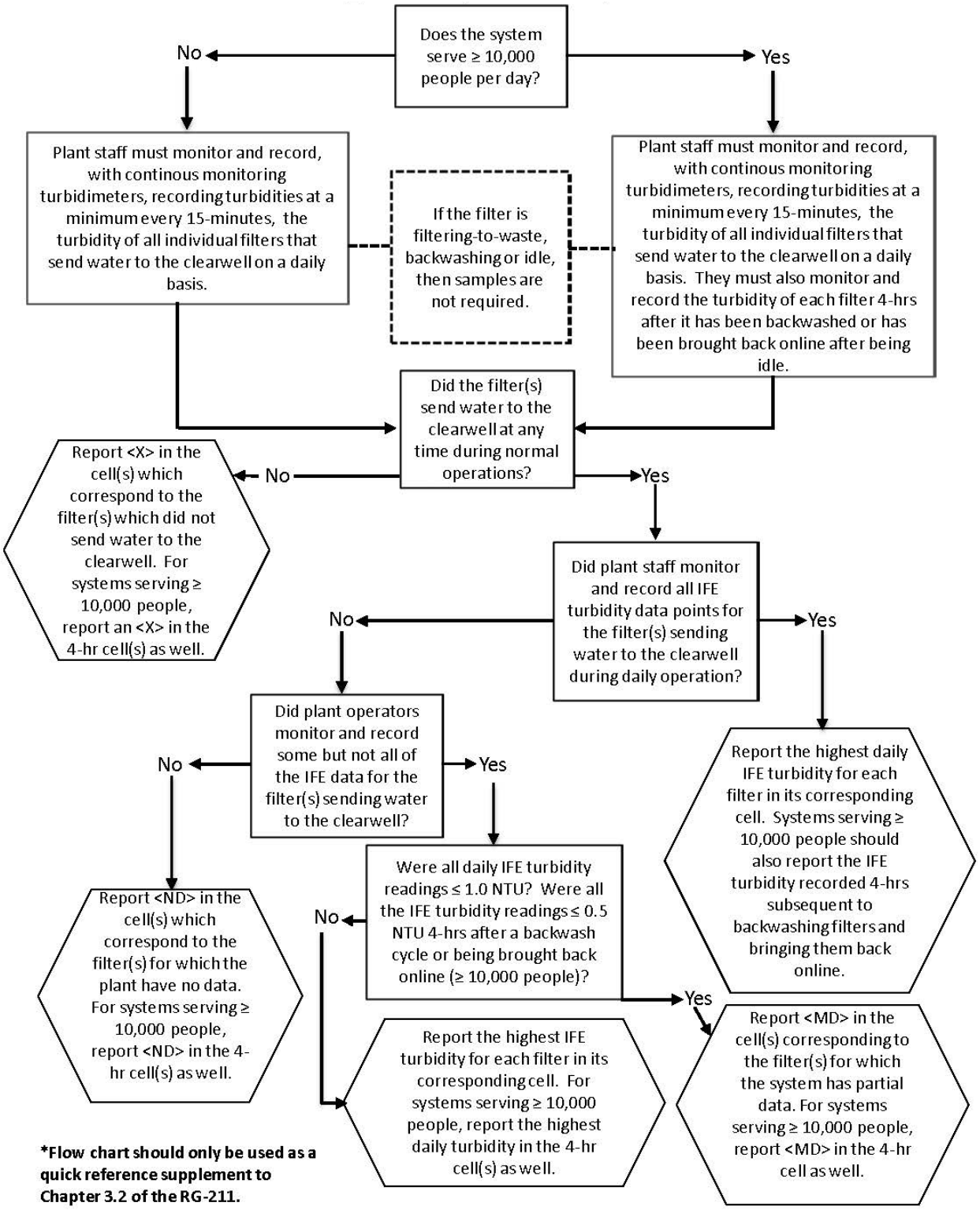
***Flow chart should only be used as a quick reference supplement to Chapter 3 of the RG-211.**

ATTACHMENT 5.

FLOW CHART FOR REPORTING INDIVIDUAL FILTER EFFLUENT (IFE) TURBIDITY

Assistance Module 3 (DAM 3)
Completing the Surface Water Monthly Operating Report (SWMOR) Using the Automated Reporting Form

Flow Chart for Reporting Individual Filter Effluent (IFE) Turbidity



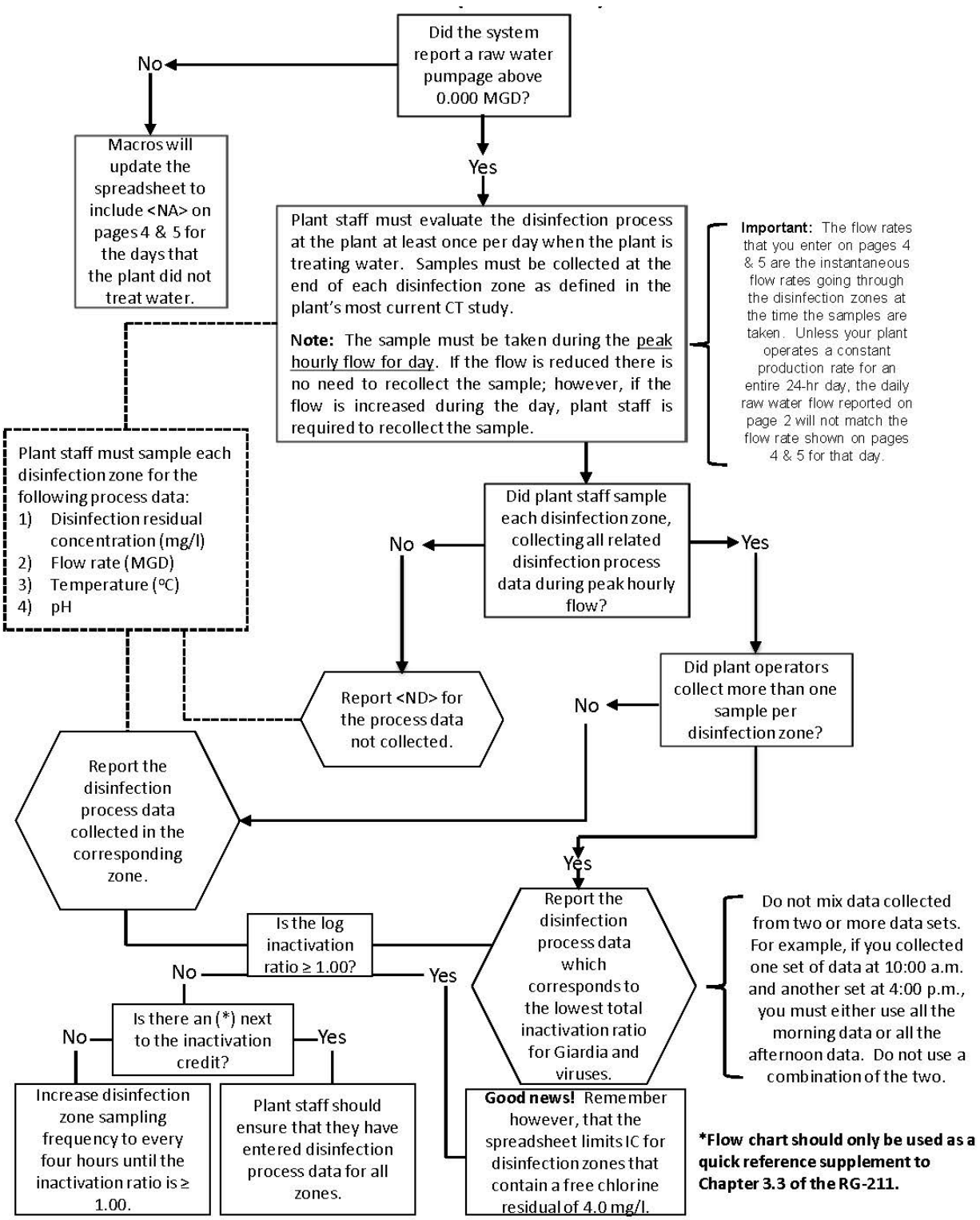
***Flow chart should only be used as a quick reference supplement to Chapter 3.2 of the RG-211.**

ATTACHMENT 6.

Flow Chart for Reporting Disinfection Performance Data on Pages 4 & 5 of the SWMOR

Assistance Module 3 (DAM 3)
Completing the Surface Water Monthly Operating Report (SWMOR) Using the Automated Reporting Form

Flow Chart for Reporting Disinfection Performance Data on Pages 4 & 5 of the SWMOR



ATTACHMENT 7. DAM 3 EVALUATION FORM

to be completed by plant staff who participated in the training activities)

Training location: _____ Date: _____

Instructor Name: _____

① Strongly Agree ② Agree ③ No Opinion ④ Disagree ⑤ Strongly Disagree

1. The agenda for this workshop accurately described the information being covered.	① ② ③ ④ ⑤
2. The information presented during the workshop was too technical or was too hard.	① ② ③ ④ ⑤
3. The information presented during the workshop was not technical enough.	① ② ③ ④ ⑤
4. The workshop covered too much information or the trainer went too fast.	① ② ③ ④ ⑤
5. The workshop covered too little information or the trainer went too slow.	① ② ③ ④ ⑤
6. The monitoring strategy developed during the workshop is useful.	① ② ③ ④ ⑤
7. The information on the Process Monitoring Form is understandable.	① ② ③ ④ ⑤
8. The training is <u>exactly</u> what we needed.	① ② ③ ④ ⑤
9. The training is valuable and will help us improve plant performance.	① ② ③ ④ ⑤
10. Our water system would be willing pay for this kind of training.	① ② ③ ④ ⑤

Questionnaire continues on the back

EVALUATION FORM, CONTINUED

Specific Suggestions:

What could we change in the agenda to improve it?

What did we not explain well enough for you to understand?

What areas did we spend too much time on?

What areas did we spend too little time on?

What are some other issues where you feel more training is needed?

What other comments or suggestions do you have?

Inside back cover

Revision table

Date	**Action**	**Comment**
November 2003	Created	Version 1
July 2013	Revised	Incorporate changes to SWMOR form
August 24, 2019	Revised	Revised to meet TCEQ accessibility standards

Thanks for participating in this Directed Assistance Module (DAM)