

How to Create, Customize, and Save Your SWMOR-Alt

General Information about the Spreadsheets

The Surface Water Monthly Operating Report for Alternative Technologies (SWMOR-Alt) is for public water systems that produce drinking water from surface water or groundwater under the direct influence of surface water using alternate technologies. The EPA's Long Term 2 Enhanced Surface Water Treatment Rule (LT2) defines the alternate technologies that can receive credit for removal or inactivation of pathogens.

As you work with the SWMOR-Alt spreadsheets, you will find many features that make it easier for you to use. The following general information will help you use the spreadsheets.

An Excel spreadsheet is also called a workbook which is made up of separate worksheets. After you open the workbook, you will find a series of tabs at the bottom of the screen. Each of these tabs identifies one of the worksheets in the workbook. When you click on one of these tabs, the tab will change from gray to white and the program will take you to the worksheet for the pages shown on the tab.

Because the SWMOR-Alt is an electronic file, we have been able to place many instructions and comments directly in the two spreadsheets. Those electronic comments will help you immediately while you are completing the form.

“We” and “You” in This Guide

“We” as used in this guide refers to the Texas Commission on Environmental Quality—specifically, the TCEQ's Water Supply Division.

In this guide, “you” means the person who must sign the SWMOR or SWMOR2 each month. Under the rules, this person must be the certified surface water treatment plant operator who is responsible for the daily supervision of the plant.

CUSTOMIZING YOUR SWMOR SPREADSHEET

In this chapter, we go through the steps you need to complete to customize the SWMOR, SWMOR-Alt, and SWMOR2 spreadsheets for your specific plant. Although some specific steps for customizing your spreadsheet depend on which one you are using, the process is very similar for all three of the monthly reports, so the instructions are given together in this chapter.

ATTENTION SWMOR2 USERS

The SWMOR2 is customized in exactly the same way as the SWMOR. Although we wrote Chapter 9 to help you fill out the SWMOR2 report, we did not repeat any of the information presented in Chapter 2. Therefore, you will need to read this chapter even if you are using the SWMOR2 spreadsheet.

1.1 CREATE YOUR SWMOR MASTER FILE

The first time you use one of the three SWMOR spreadsheets, you will enter the data that will customize it for your plant. After customizing the spreadsheet once, and saving the customized master file, you will not need to do this step again unless there are changes to your plant.

FILE MANAGEMENT

If you don't have a system for saving electronic files, you should decide how you are going to save your data before you get too far. We recommend that you create a series of special folders (or subdirectories) so that you will know where all your MOR records are stored. Several plants have found the following file structure (shown in **Figure 1.1**) to be useful.

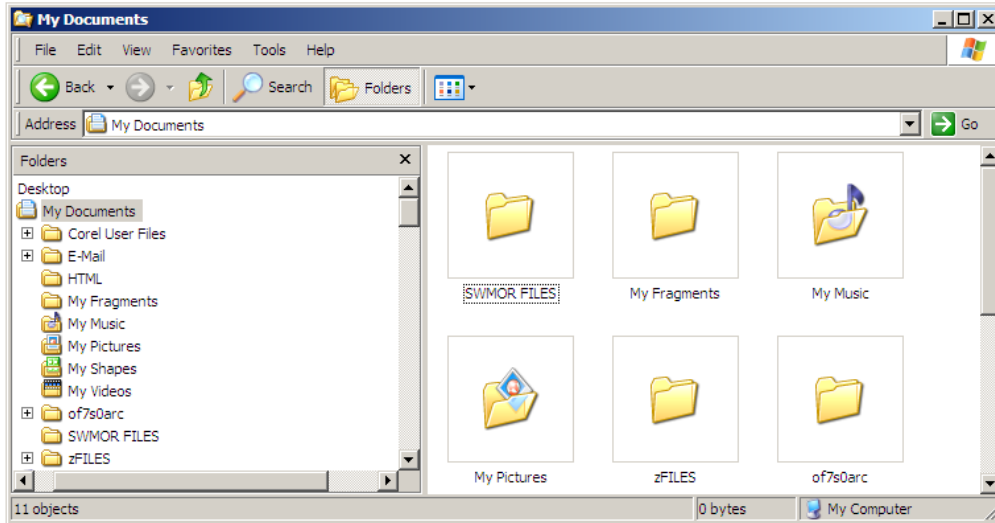


Figure 1.1. Sample File Structure

Backing Up Your Data

Depending on which of the SWMOR spreadsheets you are using, each of your monthly reports will require between 2.5 and 4.2 Megabytes of storage space on your hard drive. Although you will be able to store many months of data on your hard drive, you should always save a backup copy of the file somewhere else. Computer hard drives have been known to crash, taking data with them! You must maintain a copy of each monthly report for at least three years. We recommend that you back up each monthly report on a CD-ROM, or at least keep a printed copy of each report in your files.

Enable Content? Yes!

When you open the SWMOR file, a Microsoft Excel Security Warning notification will pop up just below the Ribbon bar at the top of the window. The purpose of this warning is to let you know that the workbook you are opening contains macros.

Figure 1.2 shows the Security Warning bar and the **[Enable Content]** button which you must click.

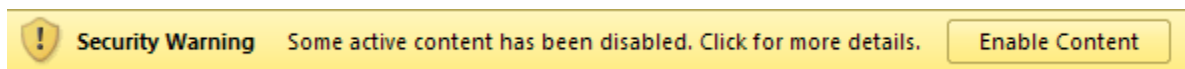


Figure 1.2. Security Warning notice and Enable Content button

For the spreadsheet to run properly, you must click the **[Enable Content]** button every time you open the spreadsheet or include your SWMOR subdirectory in your list of “Trusted Locations.”

WARNING ABOUT MACROS

Macros are programs that will automatically execute when you open a file. Unless you are absolutely sure that you have obtained the file from a reliable source, you should be very wary about enabling a spreadsheet macro because hackers can hide computer viruses in the macro. If you have any doubts, scan the spreadsheet with an up-to-date anti-virus program.

1.2 THE CUSTOMIZE MOR DIALOG BOX (SWMOR-ALT ONLY)

Attention SWMOR and SWMOR2 users

The **Customize MOR** dialog box is only used in the SWMOR-Alt spreadsheet. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 2.3.

If you are using the SWMOR-Alt spreadsheet, the **Customize MOR** dialog box allows you to bypass the rest of the dialog boxes if you have already created a customized master file for your plant and the plant has not changed since the master file was created. As **Figure 1.3** shows, this dialog box contains default answers to two questions.

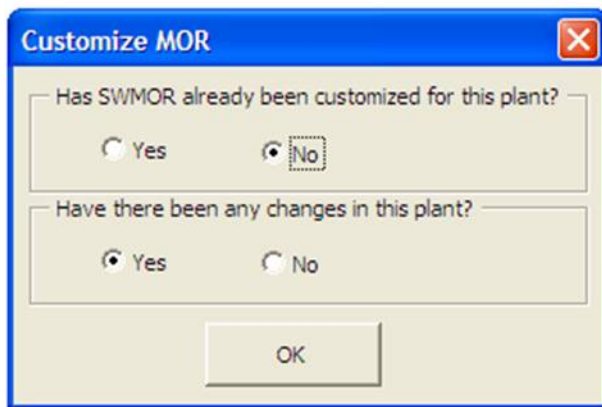


Figure 1.3. The Customize MOR Dialog Box

The default values for the two parts of this dialog box, in order, are:

- **[No]**, which indicates that the SWMOR-Alt has not been customized for your specific plant

- [Yes], a customized file has been created for your plant but something has changed since you created the customized master file.

If either of these conditions apply, just click on the [OK] button and the spreadsheet will execute the macros that allow you to create or update your customized SWMOR-Alt master file. However, if neither of these conditions apply, you can skip the rest of the macros by changing the answers to the two questions.

- If you have already created the customized master file for this plant, click on [Yes] button to change the answer for the first question from [No] to [Yes].
- If you have already created the customized master file for this plant and no changes to the plant have been made since that customization, click on [No] button to change the answer for the second question from [Yes] to [No].

If you select [Yes] for the first question and [No] for the second question, and click [OK] button, then the macro will skip all the following dialog boxes, so that you can start recording daily operation data on the SWMOR-Alt as described in Chapter 3. Otherwise, you have to finish the rest of the dialog boxes to customize the SWMOR-Alt file to your plant.

1.3 FILL OUT THE PLANT PARAMETERS DIALOG BOX

The next dialog box, **Plant Parameters**, will prompt you for the information needed to begin customizing the SWMOR spreadsheets for your plant. This dialog box is shown below in **Figure 1.4**. For the spreadsheet to run properly, you must complete the box. As you enter data in the dialog box, you may use the <Tab> key to move to the next cell, or data entry spot, and the <Shift> + <Tab> keys to move back to the previous cell.

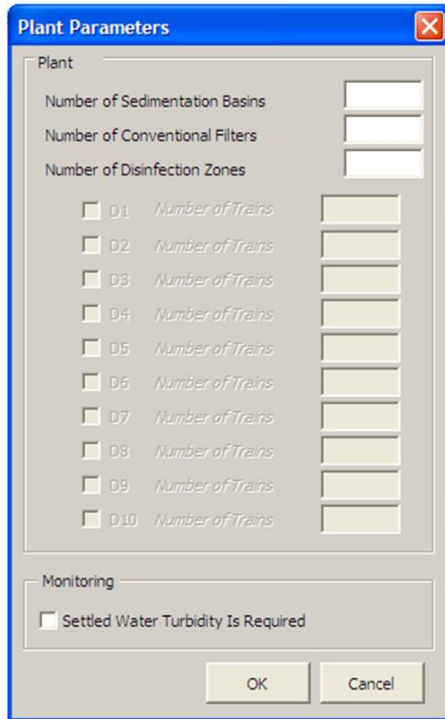


Figure 1.4. Plant Parameters Dialog Box

Most of the information that you need to enter in the **Plant Parameters** dialog box (like the number of filters at the plant) relates to the layout of your plant. The other information (like number of disinfection zones) comes from the CT study approval letter, the letter(s) that approve the design of your plant and, if you have an approved exception to one or more of our design requirements, the exception approval letter.

Number of Sedimentation Basins

Enter the total number of sedimentation basins and clarifiers at your plant.

Number of Filters

Enter the total number of filters at your plant. If you report that you have two filters, the SWMOR will ask you to confirm that you have a turbidimeter on the effluent of each filter (see **Figure 1.5**). If you do have individual filter effluent (IFE) turbidimeters on both filters, click on the **[Yes]** button and continue entering data. If you do not have IFE turbidimeters on both filters, click on the **[No]** button.

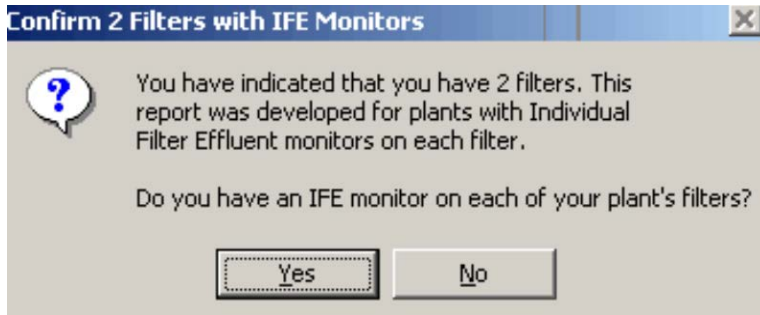
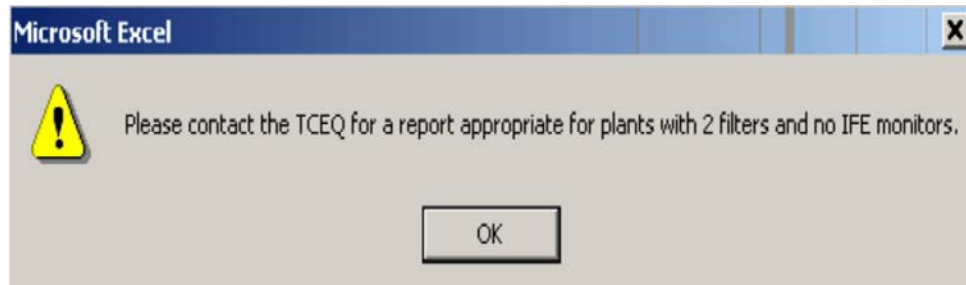


Figure 1.5. Two-Filter Confirmation for SWMOR

IMPORTANT

If the answer to the question in the confirmation dialog box as shown in Figure 2.5 is “No,” it means that you should use SWMOR2 instead of SWMOR or SWMOR-Alt. Once you click on the [No] button, the instruction message box shown below will pop up. You have to click on the [OK] button before the macro will finish running. This macro adds a watermark to each of the worksheets stating “You have indicated that your plant has two filters but no IFE monitors. Therefore you must use the SWMOR2 spreadsheet. Contact the TCEQ for a copy of that report.” Although the spreadsheet is still functional, the watermark will be printed out on every page when you print the report and the report will not be accepted by TCEQ. You should immediately close the spreadsheet without saving any changes and use SWMOR2 instead.



Number of Disinfection Zones

Your CT study approval letter will describe the disinfection zones and treatment trains that exist at your plant. The disinfection zones are numbered; for example, zones will be numbered D1, D2, and so on. Enter the total number of disinfection zones that are defined in your plant’s CT study approval letter. If the letter no longer accurately describes your disinfection zones or if you want to change the disinfection zones, you need to submit a new CT study for our review.

Number of Trains

After you enter the number of disinfection zones at your plant, hit **[Enter]** and the **Number of Trains** cell will pop up beside each of the zones you have at the plant. If there is more than one train in a zone, your CT approval letter will identify each train with a letter as a suffix, for example, if disinfection zone D1 contains three trains, the trains will be identified as D1A, D1B, and D1C. For each disinfection zone, enter the number of treatment trains defined in your plant's CT study approval letter.

Settled Water Turbidity Is Required

We typically require plants that have an exception to our design rules for detention time and/or surface overflow rate to monitor settled water turbidity levels periodically—usually daily. The most common reason that we require operators to monitor settled water turbidity levels is as a condition for receiving an exception to some aspect of the design rules. We also occasionally impose this requirement for other reasons. For example, we sometimes require plants to conduct settled water monitoring as part of a mandatory Corrective Action Plan (CAP). If your plant does not have one of these exceptions or CAPs, we still recommend that you monitor settled water turbidity levels daily.

If we do not require you to run these tests, you should leave the box empty even if you routinely monitor settled water turbidity levels. If we have required your plant to monitor settled water turbidity, you must place a check mark in the **[Settled Water Turbidity Is Required]** box. To place a check in the box, place the cursor on top of the box and then press the left click button on your mouse. If you have done this correctly, a check will appear in the box.

Figure 1.6 shows an example of the **Plant Parameters** dialog box as it would be completed for a plant that must monitor settled water turbidity. The entries indicate that the plant has two sedimentation basins and six filters. The figure also shows that this plant has three disinfection zones, each of which has only one treatment train. Finally, the figure indicates that the plant has been required to monitor settled water turbidity levels for some reason.

Figure 1.6. Plant parameters dialog box

Once you have entered the last piece of data in the **Plant Parameters** dialog box, click on the **[OK]** button. At this point, you will be able to enter the rest of the information from your CT study approval letter into the **Disinfection Process Parameters** dialog box.

IMPORTANT

If you click on the **[OK]** button, the SWMOR spreadsheets will execute the macro that updates appropriate cells on **P.2-Turbidity Data**, **P.3-Filter Data** and **P.4&5-Disinfection Data** worksheets. Since this update process can take quite some time, you should press the **[Cancel]** button if the **Plant Parameters** dialog box already properly describes your plant.

BE PATIENT

If you do need to change the information about your plant, it may take up to two minutes for this **[OK]** button's macro to finish running (or longer, depending on your plant's design and/or computer). In general, do not click buttons or type while you are waiting for the program to perform a calculation or run a macro.

1.4 FILL OUT THE DISINFECTION PROCESS PARAMETERS

The next dialog box, **Disinfection Process Parameters**, will prompt you for the information needed to continue customizing your SWMOR. You must complete this dialog box for the spreadsheet to run properly. As you enter data, you may use the **<Tab>** key to move to the next cell or data entry spot, and the **<Shift> + <Tab>** keys to move back to the previous cell.

Figure 1.7 shows a blank **Disinfection Process Parameters** dialog box. As the figure indicates, the dialog box is divided into two sections: **Residual Disinfectant** and **Approved CT Study Parameters**. You must complete both sections of the dialog box or the SWMOR spreadsheets will not work properly.

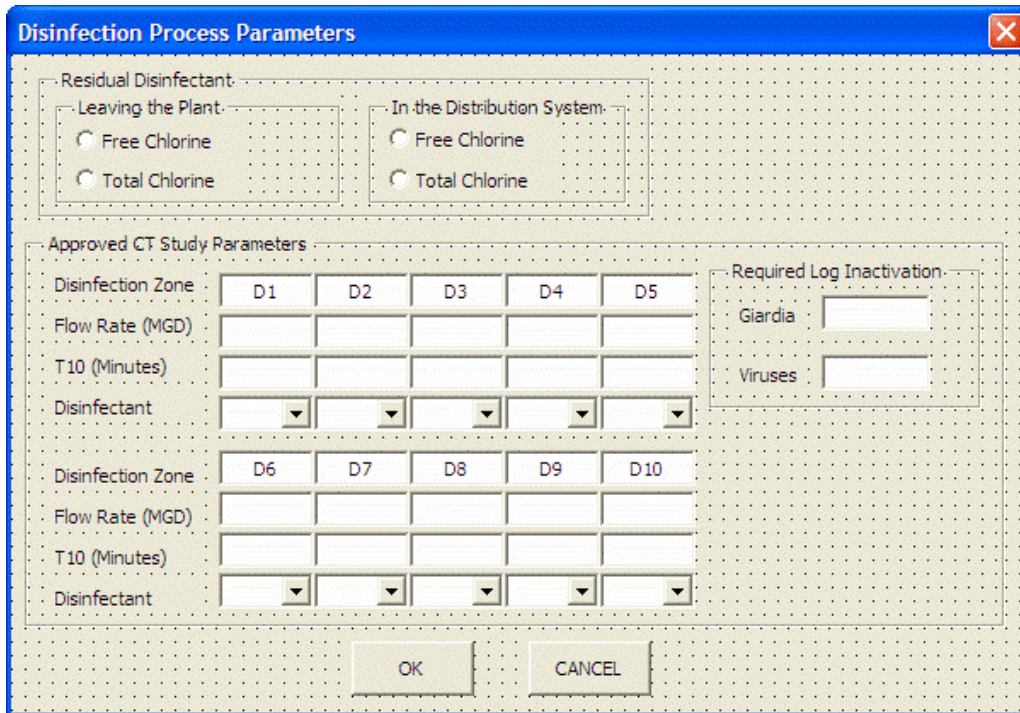


Figure 1.7. Disinfection Process Parameters Dialog Box

Most of the information you need to complete the **Disinfection Process Parameters** dialog box will come directly from your CT study approval letter. (See Appendix A for an example of a CT study approval letter.) The other information that you need to enter includes the residual disinfectant entering the distribution system and the residual disinfectant in the distribution system.

Once you finish filling out the **Disinfection Process Parameters** dialog box, the SWMOR spreadsheets use the information to complete parts of the **P.1-Summary** and the **P.4&5-Disinfection Data** worksheets.

Residual Disinfectant

You must fill out this area of the **Disinfection Process Parameters** dialog box based on your plant's normal operating practices. If your plant normally adds ammonia at some point in the treatment process, you must select **[Total Chlorine]** as your default disinfectant. You must select **[Free Chlorine]** as your default disinfectant if your plant does not add ammonia to the water before it leaves the plant.

Although the water leaving the plant usually contains the same disinfectant as the water in the distribution system, the SWMOR spreadsheets will not prevent you from selecting one type of disinfectant for the water leaving the plant and a different disinfectant for the water in the distribution system. However, this treatment

approach is unusual so you will get the dialog box shown in **Figure 2.8** if the two selections do not match. Click on the **[Yes]** button if you really are using two different types of disinfectants and the **[No]** button if the same type of disinfectant is present in both the water leaving the plant and in the distribution system.

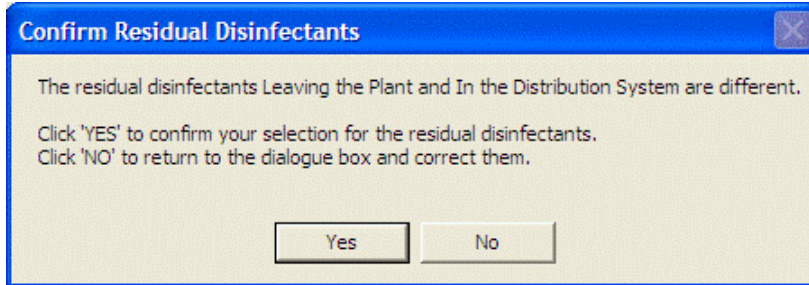


Figure 1.8. Confirm disinfectant selection dialog box

Leaving the Plant

The SWMORs use the disinfectant you select in this part of the **Disinfection Process Parameters** dialog box to set the default residual level you must maintain in the water leaving the plant.

In the Distribution System

The SWMORs use the information you select in this part of the **Disinfection Process Parameters** dialog box to set the default residual level that you must maintain in the distribution system.

Approved CT Study Parameters

Your CT study approval letter identifies the disinfection zones and treatment trains in your plant and describes three approved parameters for each zone and train. These three parameters are the flow rate, T₁₀, and disinfectant type. The flow rate and T₁₀ information that you need to complete this section of the dialog box are provided in a table that is usually located near the end of the letter. The information about the disinfectant normally used in each of the zones is usually located near the front of the letter where we describe the plant's general treatment and disinfection processes. (See Appendix A for an example of a CT study approval letter.)

Flow Rate (MGD)

You must enter the flow rate for each disinfection zone and train defined by your plant's CT study approval letter in the appropriate cell in the dialog box. You must enter this value in million gallons per day (MGD).

T₁₀ (minutes)

You must also enter the approved T₁₀ time for each disinfection zone/train defined by your plant's CT study approval letter in the appropriate cell in the dialog box. You must enter this value in minutes.

Disinfectant

The <Disinfectant> boxes in this section of the **Disinfection Process Parameters** dialog box contain a drop-down list that contains all of the possible disinfectants that can be used in the disinfection zone or treatment train. Use the drop-down lists to select the type of disinfectant residual maintained in each of the disinfection zones/treatment trains identified in the CT study approval letter. The abbreviations for the possible disinfectants are shown in **Table 1.1**.

Table 1.1. Abbreviations for Disinfectants.

Abbreviation	Disinfectant
FCL	free chlorine
CLO2	chlorine dioxide
CLA	chloramines
O3	ozone
O3 Cell 1	first cell ozone residual (applicable if ozone residual is measured in the first cell of the ozone reactor)
NA	the disinfection zone is not normally used

IMPORTANT

The **Disinfection Process Parameters** dialog box will not allow you to select NA for a particular disinfection zone or treatment train unless:

1. You reported NA in any of the previous zones or trains, OR
2. You reported a disinfectant residual in a previous zone or train BUT
 - a. some, but not all, of the parallel trains in this particular zone are reported as NA AND
 - b. at least one of the remaining trains in this particular zone is reported as NA.

The CT study approval letter also establishes performance standards for the disinfection process at your plant. Depending on the treatment processes for physical removal at the plant, the disinfection process is required to achieve a minimum value for the log inactivation of *Giardia lamblia* cysts and viruses.

Required Log Inactivation of *Giardia lamblia* Cysts

Enter the amount of *Giardia* inactivation that the disinfection process is required to achieve at your plant. Unless the TCEQ has established an alternative performance standard for your plant, the disinfection process must achieve a 0.5-log inactivation of *Giardia lamblia* cysts.

Required Log Inactivation of Viruses

Enter the amount of viral inactivation that the disinfection process is required to achieve at your plant. Unless the TCEQ has established an alternative performance standard for the plant, your disinfection process must achieve a 2.0-log inactivation of viruses.

Once you have entered the last piece of data in the **Disinfection Process Parameters** dialog box, click on the **[OK]** button. At this point, if you are using the SWMOR or SWMOR2 spreadsheets, the macro will finish running and create the customized spreadsheet for your plant. If you are using SWMOR-Alt, the customization process is not yet complete and further dialog boxes will appear at this point, as explained in section 2.5 through 2.10.

IMPORTANT

If you click on the **[OK]** button, the SWMOR-Alt spreadsheet will execute the macro that updates appropriate cells on **P.1-Summary** and **P.4&5 Disinfection Data** worksheets. Since this update process can take quite some time, you should press the **[CANCEL]** button if the **Disinfection Process Parameters** dialog box already properly describes your plant.

BE PATIENT

If you do need to change the information about your plant, it may take up to two minutes for this **[OK]** button's macro to finish running (or longer, depending on your plant's design and/or computer). In general, do not click buttons or type while you are waiting for the program to perform a calculation or run a macro.

When the macro that tells the spreadsheet about your plant data finishes running, the spreadsheet will be ready for you to type in your plant information and data.

Example 1-1 : Entering Data in the Disinfection Process Parameters Dialog Box

Figure 1.9 indicates how you should complete the **Disinfection Process Parameters** dialog box for the plant with the CT study approval letter in Appendix A.

Disinfection Zone	1	2	3		
Flow Rate (MGD)	1.440	0.480	0.960		
T10 (Minutes)	46.7	11.7	222.1		
Disinfectant	FCL	FCL	CLA		

Figure 1.9. Example Data Entry in the Disinfection Process Parameters Dialog Box

The plant description (page A-1) indicates that liquid ammonium sulfate (LAS) is applied upstream of the clearwells. Therefore, the treatment plant is using chloramines as a residual disinfectant. Consequently, **Total Chlorine** is selected in the **Residual Disinfectant** section of the dialog box under **Leaving the Plant** and **In the Distribution System**.

The CT study approval letter also identified three disinfection zones for the plant. The flow rate and T₁₀ values for each of the three zones that are summarized in Table 2 of the CT study approval letter 1 have been copied into the appropriate cell of the dialog box.

The plant description also indicates that there is a standby LAS injection point located just downstream of the rapid mix but, as noted previously, the primary LAS injection point is located upstream of the clearwells. Therefore, the dialog box indicates that free chlorine (FCL) is the primary disinfectant used in zones D1 and D2 and chloramines (CLA) is the primary disinfectant used in zone D3.

1.5 ALTERNATIVE TECHNOLOGIES AND LT2 (SWMOR-ALT ONLY)

Attention SWMOR and SWMOR2 users

The **Alternative Technologies and LT2 ESWTR** dialog box appears only in SWMOR-Alt. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 1.11.

The EPA adopted the Long Term 2 Enhanced Surface Water Rule (LT2) in 2006 to reduce potential health risks from *Cryptosporidium*. Under LT2, SWTPs were classified in “Bins” according to the amount of *Cryptosporidium* in their raw water. We informed you of your plant’s bin classification in a LT2 Bin Classification letter. If you can’t find your letter, contact the LT2 rule coordinator at (512) 239-4691 or <SWTPMOR@tceq.texas.gov> to get a copy.

In order to receive additional *Cryptosporidium* removal credit for any of the technologies described in this section, you must have TCEQ approval in writing. Therefore, before customizing your SWMOR-Alt to include one of these technologies, you should make sure you have a copy of the approval letter. That approval letter will contain information about what requirements we placed on the technology, and will help you customize the SWMOR-Alt correctly.

If you are working on SWMOR-Alt, the **Alternative Technologies and LT2** dialog box will appear after you finish the **Disinfectant Process Parameters** dialog box. The **Alternative Technologies and LT2** dialog box consists of two parts as shown in **Figure 1.10**: non-conventional treatments in your plant and compliance with LT2 in your plant.

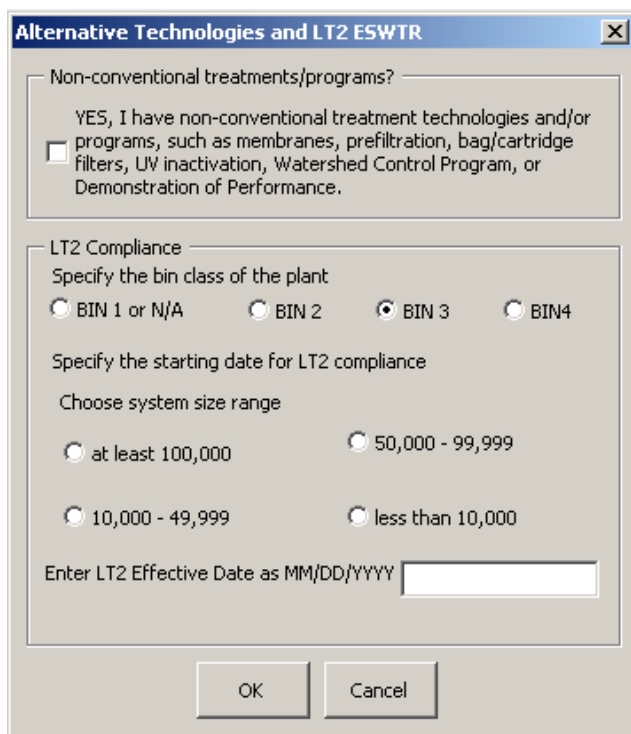


Figure 1.10. Alternative Technologies dialog box showing compliance strategies for LT2

Non-conventional treatments/programs?

If you have at least one of the following treatment systems and/or programs, click the checkbox to answer **[YES]**:

- Membrane filtration
- Prefiltration
- Presedimentation with coagulation
- Two-stage lime softening
- Bank filtration
- Bag or cartridge filtration
- Second stage filtration
- UV inactivation
- Chlorine dioxide/ozone inactivation
- Watershed control program
- Demonstration of performance

LT2 Compliance

You must specify the bin class of your plant. If you select **[Bin 2]**, **[Bin 3]**, or **[Bin 4]**, you must choose your system's population size range and enter the LT2 effective

date. If you select [Bin 1] or [N/A], the size range and LT2 effective date portion of the dialog box will gray out because it does not apply to your system.

1.6 TREATMENT TECHNOLOGIES (SWMOR-ALT ONLY)

Attention SWMOR and SWMOR2 users

The **Treatment Technologies** box appears only in SWMOR-Alt spreadsheet. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 1.11.

Based on the answers you provided in the **Alternative Technologies and LT2** dialog box, the VBA macro determines whether you need to finish the **Treatment Technologies** dialog box. As shown in **Figure 1.11**, the **Treatment Technologies** dialog box includes five categories where you can earn credits for *Cryptosporidium* removal.

Figure 1.11. Treatment Technologies

Source Protection and Management

If your plant has approved credit by a watershed control program, you must select the appropriate checkbox for [Watershed Control Program].

Pre Filtration

If your plant employs prefiltration processes, you can select appropriate checkboxes for: [Presedimentation Basin with Coagulation], [Two-stage Lime Softening], and/or [Bank Filtration].

Presedimentation Basin with Coagulation: You should check the [Presedimentation Basin with Coagulation] box if:

- you have a presedimentation basin located upstream of your primary rapid mix and sedimentation basins or clarifiers,
- all the water that you treat normally passes through the presedimentation basin before primary treatment begins, and

- you normally apply a coagulant continuously to the water as it enters the presedimentation basin.

If your presedimentation basin does not meet all three of these criteria, you should not check this box.

Two-stage Lime Softening: You should check the [Two-stage Lime Softening] box only if you have two-stage lime softening.

Bank Filtration: You should select the [Bank Filtration] box only if you have approval for practicing river bank filtration. Note, if you select [Bank Filtration], you must also enter the number of bank filters (or wells) that supply your plant. The SWMOR-Alt spreadsheet can accommodate as many as 20 bank filters so you may only enter values from 1 to 20. If you have more than 20 wells, you will need to contact us for a customized spreadsheet.

Treatment Performance

There are two ways that you can receive additional pathogen removal credit by ensuring that your plant performs extremely well: either by producing water with extremely low turbidity from each filter or by demonstrating to the TCEQ that your plant is able to demonstrate excellent performance.

Enhanced Filter (IFE) Performance: If you want to receive additional pathogen removal credit for enhanced filter performance data (that is, producing filtered water with 95% of IFE turbidity levels below 0.15 NTU, never exceeding 0.3 NTU), you should select the [Enhanced Filter (IFE) Performance] checkbox.

In order to receive any credit for granular filters, you must continuously monitor turbidity from each filter.

Demonstration of Performance: Additionally, if your plant has acquired additional credits by a [Demonstration of Performance], you should select the checkbox and enter the approved credit. Demonstration of performance covers any innovative or non-standard treatment that is not described by the specific processes described in this chapter. If you have approval for this, all the details will be in the letter.

Additional Filtration

Bag or Cartridge Filters: If you select [Bag or Cartridge Filters], you must also enter the number of assemblies, indicate if they are for primary or secondary treatment, report the maximum approved log credit you receive, and if we have approved an alternative method of continuously monitoring the performance of the individual cartridge assemblies. Please note that there is a limit of 15 assemblies allowed in the spreadsheet.

If you have granular filters with IFE monitoring, and you are claiming log removal for that granular filtration, you can add bag and cartridge downstream without continuous IFE—just monitor once a day—and you can get credit for these secondary bag and cartridge filters.

Section 6 provides detailed information about bag and cartridge filtration.

Membrane Filtration: If you select **[Membrane Filtration]**, you must indicate the type of the direct integrity test (DIT) method you use to verify the ongoing performance of the membrane units and enter the number of membrane units (racks). The next section of this guide provides the details of how to record DITs.

- Select the **[PBT]** box if you use a pressure based DIT method. That is, select this option if you measure the rate that the pressure drops in the membrane unit during a DIT test.
- Select the **[QBT]** box if you use a volumetric, or airflow, based DIT method. That is, select this option if you measure the volume of air that has to be added to the membrane unit during a DIT test.
- Select the **[MBT]** box if you use a marker-based DIT method. That is, select this option if you feed a known amount of a pathogen-sized marker (or particles) during the DIT and then actually measure the amount of marker removed by the membrane unit.

If you indicate that you use a specific DIT method, you must also indicate how many membrane units use that DIT method and what kind of indirect integrity test (IIT) method you use to continuously monitor their performance.

- The SWMOR-Alt spreadsheet can accommodate as many as 20 units for each type of DIT method so you may only enter values between 1 and 20.
- Select **[Laser Turbidimeter]** as your IIT method if you use a laser turbidimeter to continuously monitor the performance of each unit, and
- Select **[Others]** as your IIT method if you use a particle counter, particle monitor, or some other parameters to continuously monitor the performance of each unit.

Section 7 provides detailed information about membrane filtration.

Second Stage Filtration: You should select the **[Second Stage Filtration]** box if your plant employs second stage filtration. This option is primarily

intended for systems that use sequential media filters. However, under some circumstances, second-stage filtration credit may be granted for cartridge filters used in sequence with other filters.

For example, if you use a cartridge filter prior to membrane filtration, and monitor its turbidity once a day, you may request second-stage filtration credit for the cartridge filters—even though the “second” stage comes first.

Section 9 provides detailed information about second stage filtration.

Inactivation

If your plant uses chlorine dioxide, ozone, or UV inactivation processes, select the appropriate checkboxes.

You must input the amount of credit that you have requested and received approval for. If your plant’s alternative disinfection process is approved to receive, for example, 2-log inactivation of *Cryptosporidium*, and your disinfection process fails to reach that level for four or more hours, you will receive no credit for that four-hour period. Therefore, it is important that the SWMOR reflects your approved inactivation parameters.

1.7 APPROVED DIRECT INTEGRITY TEST PARAMETERS (SWMOR-ALT ONLY)

Attention SWMOR and SWMOR2 users

The **Direct Integrity Test** dialog boxes appear only in SWMOR-Alt. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 1.11.

If you selected **[Membrane Filtration]** in the **Treatment Technologies** dialog box, you should specify parameters of the direct integrity test for each membrane unit. According to your selection for the direct integrity test(s), corresponding dialog boxes will appear in order to obtain parameters of the direct integrity test. Note that the number of membrane units should not be greater than 20.

PBT DIT (Pressure-based Decay Integrity Test) Parameters

If you selected the **[PBT]** in the **Treatment Technologies** dialog box, the **Input-PBT** dialog shown in **Figure 1.12** will appear. For each unit, you have to enter the following integrity test parameters:

P_{min} (minimum initial test pressure, psi): Enter the plant's P_{min} in the column headed <P_{min}>. The P_{min} is the minimum pressure under which air can pass through a 3-µm breach in a membrane system. Thus, during an integrity test, applied air pressure should be greater than P_{min}. Note that P_{min} is referred to as P_{test} in the EPA's **MEMBRANE FILTRATION GUIDANCE MANUAL**.

LRC (log-removal credit): You should enter the log-removal of *Cryptosporidium* oocysts obtained during a challenge test for each membrane unit in the column headed <LRC>. The LRC is the maximum log-removal credit you can get from a direct integrity test. Note that LRC is referred to as LRV (log-removal value), LRV_C, or LRV_{C-Test} (log-removal value in challenge test) in the EPA's **MEMBRANE FILTRATION GUIDANCE MANUAL**.

UCL (upper control limit, psi/min): You should enter the upper control limit for the pressure decay rate for each membrane unit in the column headed <UCL>. The upper control limit is the maximum pressure decay rate that guarantees the integrity of a membrane system during a direct integrity test. That is, if the pressure decay rate obtained during a direct integrity test is greater than the UCL, the membrane system has at least one breach greater than 3 µm. Note that, in a pressure decay integrity test, the units of the UCL are psi/min.

	Pmin (psi)	LRC	UCL (psi/min)
Unit 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Unit 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Unit 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
Unit 19	<input type="text"/>	<input type="text"/>	<input type="text"/>
Unit 20	<input type="text"/>	<input type="text"/>	<input type="text"/>

OK Cancel

Figure 1.12. Conditions for the Pressure-Based Direct Integrity Test

QBT DIT Parameters (Air Flowrate Integrity Test)

If you selected the [QBT] direct test in the **Treatment Technologies** dialog box, the **Input-QBT** dialog shown in **Figure 2.13** will prompt you to enter the following integrity test conditions for each unit:

P_{min} , minimum initial test pressure, psi: You should enter the minimum pressure for each membrane unit in the column headed $\langle P_{min} \rangle$. P_{min} is the minimum pressure under which air can pass through a 3- μm breach in a membrane system. Thus, during an integrity test, the applied air pressure should be greater than P_{min} . Note that P_{min} is referred to as P_{test} in the EPA **MEMBRANE FILTRATION GUIDANCE MANUAL**.

LRC, log-removal credit: You should enter the log-removal of *Cryptosporidium* oocysts obtained during a challenge test for each membrane unit under the $\langle LRC \rangle$ heading. LRC is the maximum log-removal credit you can get from a direct integrity test. Note that LRC is also referred to as LRV (log-removal value), LRV_C , or LRV_{C-Test} (log-removal value in challenge test) in the EPA **MEMBRANE FILTRATION GUIDANCE MANUAL**.

UCL, upper control limit, L/min: You should enter the upper control limit of the air flowrate for each membrane unit in the column headed $\langle UCL \rangle$. The UCL is a maximum air flowrate that guarantees the integrity of a membrane system during a direct integrity test. That is, if the air flowrate observed during a direct integrity test is greater than the UCL, the membrane system has at least one breach greater than 3 μm . Note that, in an airflow integrity test, the units of the UCL are L/min.

	Pmin (psi)	LRC	UCL (L/min)
Unit 1			
Unit 2			
Unit 3			
Unit 18			
Unit 19			
Unit 20			

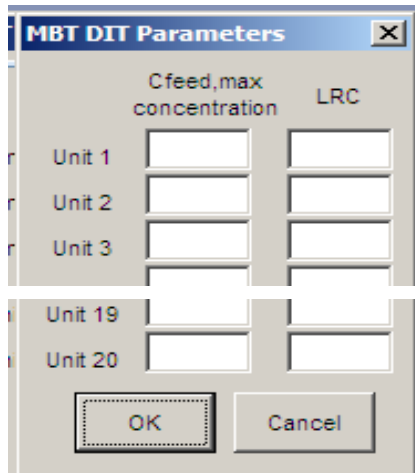
Figure 1.13. Conditions for the air flowrate-based direct integrity test

MBT DIT Parameters (Marker Integrity Test)

If you selected $\langle MBT \rangle$ in the **Treatment Technologies** dialog box, the **MBT DIT Parameters** dialog box shown in **Figure 1.14** will prompt you to enter the following integrity test parameters for each unit:

$C_{feed, max}$, maximum marker concentration in feed, mg/L: You should provide $\langle C_{feed, max} \rangle$, which is the maximum marker concentration in the feed solution. Thus, during an integrity test, the marker concentration in the feed solution should not be greater than $C_{test, max}$.

LRC, log-removal credit: You should enter the log-removal of *Cryptosporidium* oocysts obtained during a challenge test for each membrane unit in the column headed <LRC>. The LRC is the maximum log-removal credit you can get from a direct integrity test. Note that LRC is referred to as LRV (log-removal value), LRV_C, or LRV_{C-Test} (log-removal value in challenge test) in the EPA Membrane Filtration Guidance Manual.



	Cfeed,max concentration	LRC
Unit 1	<input type="text"/>	<input type="text"/>
Unit 2	<input type="text"/>	<input type="text"/>
Unit 3	<input type="text"/>	<input type="text"/>
Unit 19	<input type="text"/>	<input type="text"/>
Unit 20	<input type="text"/>	<input type="text"/>

Figure 1.14. Conditions for the Marker-Based Direct Integrity Test

1.8 UV VALIDATION METHOD (SWMOR-ALT ONLY)

Attention SWMOR and SWMOR2 users

The **UV Validation Method** dialog box appears only in SWMOR-Alt. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 1.11.

If you selected [UV] in the **Treatment Technologies** dialog box, you must complete the **UV Validation Method** dialog box as shown in **Figure 1.15**. The dialog box has two sections: **Location of UV Reactors** and **UV Reactor Validation Method**.

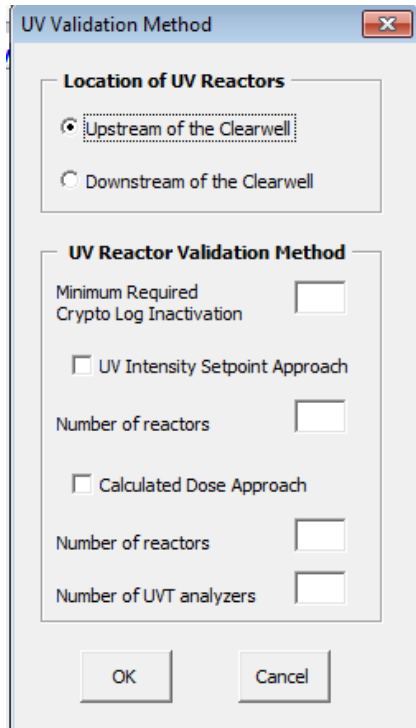


Figure 1.15. UV Validation Method Dialog Box

Location of UV Reactors

Select whether the UV reactors are [Upstream of the Clearwell] or [Downstream of the Clearwell] by clicking on the appropriate button.

UV Reactor Validation Method

To receive treatment credit, plants using UV reactors must undergo validation testing. Validation testing can follow either the UV intensity setpoint approach or calculated dose approach. Select the validation method approved for your plant and enter the number of reactors and UV transmittance (UVT) analyzers. Also, enter the approved <Minimum Required Crypto Log Inactivation> for your plant.

UV Intensity Setpoint Approach (SWMOR-Alt only)

Attention SWMOR and SWMOR2 users

The **UV Intensity Setpoint Approach** dialog box appears only in SWMOR-Alt. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 2.11.

As shown in **Figure 1.16** below, the **UV Intensity Setpoint Approach** dialog box provides space for you to enter information about validation parameters

specific to your plant. This method relies on one or more UV intensity “setpoints” that are established during validation testing to determine UV dose. The UV intensity, as measured by the UV sensors during operation, must meet or exceed the approved setpoint(s). This criterion ensures delivery of the required dose. Additionally, the reactors must operate within validated operational conditions for flow rates and lamp status. In this approach, UVT does not need to be monitored separately because the sensors account for this parameter.

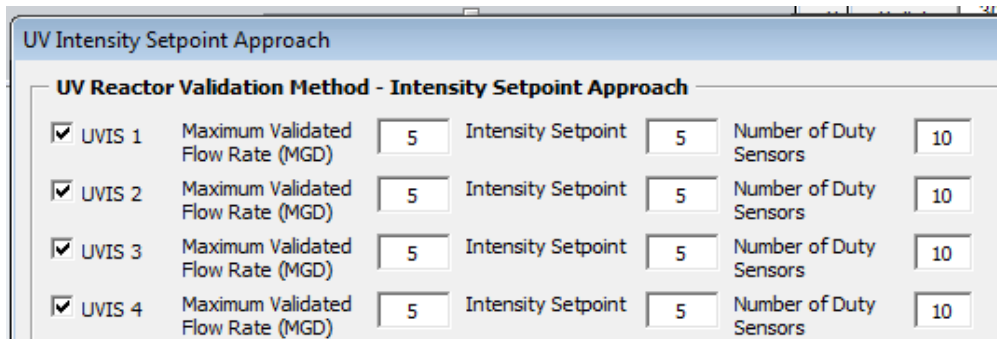


Figure 1.16. UV Intensity Setpoint Approach Dialog Box

The number of [UVIS] spaces provided depends on the number of reactors that you specified in the **UV Validation Method** dialog box. You must enter the <Maximum Validated Flow Rate> in units of MGD. Enter the <Intensity Setpoint> in units of mV/cm².

You must also enter the <Number of Duty Sensors>. The duty sensors are the on-line UV sensors installed in the UV reactors that continuously monitor the UV intensity during operation.

UV Calculated Dose Approach (CDA) (SWMOR-Alt only)

Attention SWMOR and SWMOR2 users

The **UV Calculated Dose Approach** dialog box appears only in SWMOR-Alt. If you are using the SWMOR or SWMOR2 spreadsheet, you should skip this section and proceed to section 1.11.

The calculated dose approach method uses a dose-monitoring equation to calculate an estimated UV dose. The applied UV dose is based on operating conditions such as UV intensity, flow rate, and UVT. The UV unit is calibrated during validation testing in order to determine the required dose for the target pathogen and log inactivation level.

The number of [UVCD] spaces provided in the **UV Calculated Dose Approach** dialog box (shown in **Figure 1.17**) depends on the number of reactors that you specified in the **UV Validation Method** dialog box. You must enter the <Maximum Validated Flow Rate> in units of MGD. Enter the <Minimum Validated UVT> in percent. You must also enter the <Number of Duty Sensors>. The duty sensors are the on-line UV sensor installed in the UV reactors to continuously monitor the UV intensity during operation.

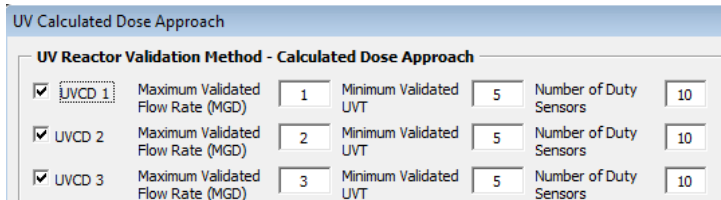


Figure 2.17. UV Calculated Dose Approach Dialog Box

1.9 IDENTIFY YOUR PLANT (ON PAGE 2 OF THE SWMOR)

After the dialog box macro describing the plant finishes running, you will need to enter additional information about the plant.

At the top of each page of the SWMOR, SWMOR-Alt, and SWMOR2 spreadsheets, you will find cells for identifying your water system and your plant. However, we have locked all of these cells except for the ones on the **P.2-Turbidity Data** worksheet. The spreadsheet has been programmed so that when you fill out the water system and plant information on page 2, that information will automatically be copied onto the other pages. When you open the spreadsheet, the program automatically takes you to the top of page 2 so that you can enter this information. **Figure 1.18** shows this part of the spreadsheet.

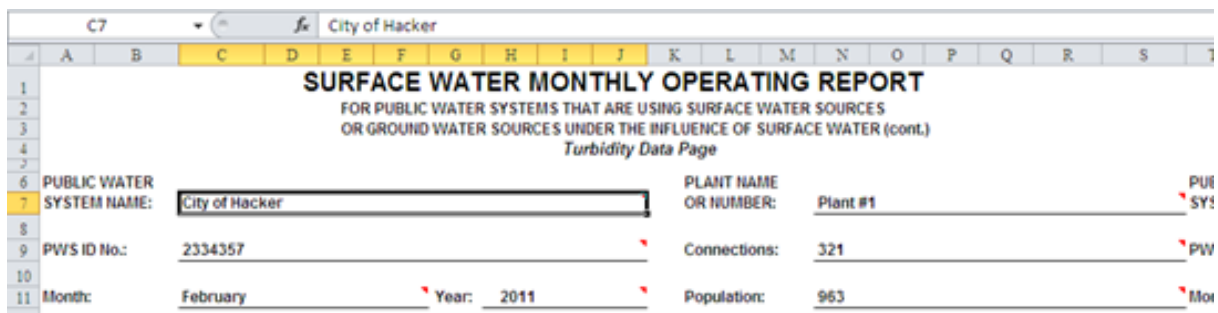


Figure 1.18. Plant Description Section of the SWMOR-Alt Spreadsheet

Public Water System Name

Enter the name of your public water system (PWS).

Plant Name or Number

If your water system has more than one treatment plant, enter the name of the treatment plant whose data is contained in this specific report. You do not have to complete this cell if your water system has only one treatment plant.

Special Case: Sometimes the trains in a single treatment plant are markedly different. In these cases, you may need to submit a separate SWMOR-Alt for each treatment train. If you think your plant should submit more than one report, call the Public Drinking Water Section at (512) 239-4691 to be sure.

PWS ID No.

Enter your water system's seven-digit PWS ID number.

1.10 SAVE YOUR CUSTOMIZED SWMOR-ALT SPREADSHEET

After you have completed the dialog boxes and entered the system information, we strongly recommend that you save a blank, master copy of the customized spreadsheet. That way, you will not have to re-enter all that data each time that you open the spreadsheet. In future months, you will be able to click on the **[Cancel]** button when the **Plant Parameters** dialog box and **Disinfection Process Parameters** dialog box open and avoid the delays that occur when running the customization macros. The only time that you will need to re-enter any of the "customized" data is when some operational or design changes are made at the plant.

NOTE

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

SWMOR_master_PWSIDNumber_PlantName

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

SWMOR2_master_PWSIDNumber_PlantName

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

Running SWMOR-Alt after You Have Customized It

You will always need to click on the **[Enable Macros]** button in the Excel dialog box when you open the spreadsheet. However, unless your plant has changed, you may

click on the **[Cancel]** button when the customization boxes open and avoid the extra delay and potential data loss that occurs when running the customization macro.

Note, if you are working on SWMOR-Alt, the **Customize MOR** dialog box will prompt you to determine whether the SWMOR-Alt file needs an update to reflect plant changes. If you select **[Yes]** for the first question and **[No]** for the second question, and click **[OK]** button, then the macro will skip all the following dialog boxes, so that you can start recording daily operation data on the SWMOR-Alt as described in other locations. Otherwise, you have to finish the rest of the dialog boxes to customize the SWMOR-Alt file to your plant.

1.11 CREATING MONTHLY FILES

You should have already customized your SWMOR-Alt (or SWMOR2), as described in the previous sections. Then, every month, you will need to create a separate electronic file for that particular month. It is best to start each month with a new file created from your original customized master file, rather than updating a previous month's file that already has data in it.

IMPORTANT

You are required to keep your SWMORs for at least three years. So, if you plan on keeping electronic copies of the SWMOR, be careful not to overwrite the file from a previous month. For this reason, it is best to start each month with a new file created from your original customized file, rather than updating a previous month's file that already has data in it.

We have added some automated features that reduce the chance that you will accidentally overwrite data from a previous month. However, this feature is not completely fail safe and it is still possible for you to lose data if you are not careful.

Enable Macros? Yes!

When the **Enable Macros** dialog box pops up, click **[Enable Macros]**. You need to enable the macros so that the spreadsheet can accurately perform its many calculations.

Plant Parameters and Disinfection Process Parameters? Cancel!

When the **Plant Parameters** and **Disinfection Process Parameters** dialog boxes pop up, click **[Cancel]**. The process you applied in sections 1.2 through 1.10 created a customized spreadsheet that describes your plant. As long as you don't

make changes to your plant (such as structural changes), you should not re-enter plant parameters when entering monthly data in order to save time and make sure that your data is accurate for the reporting month, not copied from a previous month.

IMPORTANT

As noted above, we strongly recommend that you begin each month’s report with a blank copy of your customized SWMOR. However, if you insist on using a completed report from a previous month as your starting point, you must click on the [OK] button rather than the [CANCEL] button so that the SWMOR-Alt will reset the disinfectant types to your default values.

Enter the Monthly Data about the Plant (on page 2)

After you have customized your SWMOR-Alt file to describe your plant, you need to enter the plant data at the top of the **P2-Turbidity Data** worksheet as shown in **Figure 1.19**. The spreadsheet copies whatever you type in these cells onto the other pages.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	SURFACE WATER MONTHLY OPERATING REPORT																		
2	FOR PUBLIC WATER SYSTEMS THAT ARE USING SURFACE WATER SOURCES																		
3	OR GROUND WATER SOURCES UNDER THE INFLUENCE OF SURFACE WATER (cont.)																		
4	<i>Turbidity Data Page</i>																		
6	PUBLIC WATER										PLANT NAME								
7	SYSTEM NAME: <u>Aguaville PWS</u>										OR NUMBER: <u>Schwartz Plant</u>								
9	PWS ID No.: <u>1234567</u>										Connections: <u>4,321</u>								
11	Month: <u>February</u>										Year: <u>2011</u>								
											Population: <u>13,500</u>								

Figure 1.19. Monthly Data Section of Spreadsheet

Month/Year

Use the drop-down lists to select the month and the year in which your plant collected the data.

NOTE

We have added a new feature that allows you to change the years in the drop-down list. The value of the first year in the drop-down list can be changed by changing the value shown in cell AQ2 located on the right-hand side of the **P.2-Turbidity Data** worksheet.

Connections (Community Systems)

This cell appears only on page 2 of the SWMOR. Enter the number of connections your water system serves.

You must complete this cell if your water system is a water supply corporation (WSC), municipal water supplier, or other community water system. RV parks, industrial facilities, and other noncommunity water systems do not have to complete this cell.

Population (Water Wholesalers and Noncommunity Systems)

This cell also appears only on page 2 of the SWMOR. Enter the maximum number of customers your water system serves during this reporting month.

You must complete this cell if your water system sells treated water to other public water systems or is a noncommunity water system. Community water systems that do not sell water to other public water systems do not have to complete this cell.

NOTE

The turbidity and disinfection requirements for surface water treatment plants are based on the total population served by the plant. Consequently, a system must report the approximate population that it serves through both the wholesale and retail connections that it supplies.