

How to Monitor A Non-Standard Septic System

WLS-014

❖ **Purpose:** This handout addresses the process for monitoring a non-standard septic system as required by the Sonoma County Non-Standard Septic System Monitoring Program. The property owner is required to monitor the non-standard septic system twice a year during the months of March and October, representing the wet and dry times of the year. Routine monitoring will help ensure the longevity of the septic system. A Self Monitoring Form, specific to the system, will be mailed directly to the property owner prior to March and October.

Background: The Regional Water Quality Control Board allows the County to permit non-standard septic systems, provided a program is in place to monitor the performance of these systems. Examples of these systems include: mounds, at-grades, standard trench distribution systems, sand filters, drip systems, and pre-treatment units. To enter into the monitoring program, the original non-standard septic system applicant must have executed an Easement Deed and Agreement which is binding on current and future property owners. The purpose of the Easement Deed and Agreement is to allow County and State officials to enter the property for the purpose of monitoring the system.

General Instructions: The following instructions address the minimum items that the property owner should be observing during a monitoring inspection. The Self-Monitoring Form should be completed as the observations are being made. Non-standard septic systems vary by type and date of installation and may not include all the items addressed in these instructions. When the form is completed, a copy should be maintained by the property owner and the original mailed to the Permit and Resource Management Department (PRMD).

Performance Wells: See sample monitoring form on Page 5

Purpose:

Performance wells aid in evaluating the performance of a non-standard septic system. They are usually three or four inch diameter perforated pipes with a lid or cap located near the ground surface. The performance wells may be protected by a small round box, but do not mistake the boxes over the purge valves or adjusting valves for the performance wells. The number of performance wells vary with each system, however, there should be at least one located up-slope of the system, several in or around the system, and at least one or two below the area of the system. The performance wells located 25 feet downslope of a system are used as a sampling location in order to evaluate the effectiveness of the sewage treatment. The up-slope well is considered to be the background reading and is used to compare to the downslope wells. Performance well locations can be found on the plot plan for the septic system, which can be viewed at PRMD, or with the consultant who designed the system.

Performance wells indicate whether the necessary separation to ground water is being maintained for proper sewage treatment or whether a biomat is forming within the soil which slows down vertical permeability. Within a mound or sand filter system, they indicate whether a biomat is forming at the gravel/sand interface or at the sand /soil interface. Within an at-grade system, they indicate whether a biomat is forming at the gravel/soil interface.

Section A Instructions: Monitoring Wells, see sample monitoring form on Page 5.

The number of performance wells vary for each non-standard septic system. The Self-Monitoring Form includes spaces for the documentation of up to ten performance wells. The system being monitored may have more or fewer than ten wells. Sketch the layout of the system on the back of the Self-Monitoring Form locating and numbering each performance well. In the appropriate location on the Self-Monitoring Form, measure and record the distance in inches **from ground level down** to the top of any water in the performance well. If there is no water in the performance well, indicate "dry" for that particular well. It is very important to keep a copy of the system diagram and numbered performance well locations for future use.

Sonoma County Permit and Resource Management Department

2550 Ventura Avenue ❖ Santa Rosa, CA ❖ 95403-2829 ❖ (707) 565-1900 ❖ Fax (707) 565-1399

Control/Alarm Box With and/or Without Timers (Sections B, C, D) See sampling monitor form on Page 5

Purpose:

The control/alarm box contains the breakers and fuses serving the pump, control floats and alarms. It also contains the dose counter which is used to calculate the average amount of water in gallons per day discharged to the septic system. Each system is designed for a maximum number of gallons per day and this maximum should not be exceeded. Exceeding this maximum may cause the system to fail. The instructions for completing Sections C and D pertaining to these gallons per day are found below.

Section B Instructions: Control/Alarm Box (with or without timers) see sample monitoring form on Page 5.

1. The dose counter indicates the accumulated number of doses to the system since installation. Some systems utilize a timer instead of a dose counter (see Alarm Boxes With Timers below).

In order to determine if the dose counter is working, locate, press, and release the lever labeled either "auto/off/manual" or "hand/auto" located on the side of the box. When the lever is released the dose counter should increase by one. If it does not increase by one, the dose counter is not working, and a qualified septic contractor should be contacted.

2. The control/alarm box usually has an alarm which can be audio, visual, or both. If the system does not have an audio or visual alarm, check "N/A" in the appropriate space on the monitoring form.

To determine if the alarms are working, press the lever or button labeled "test" or "alarm test". If the audible or light alarms are not working, contact a qualified septic contractor.

Section C Instructions (without timer): Dose counter reading, see sample monitoring form on Page 5.

1. Enter the current dose counter reading and the date the reading is taken in the appropriate boxes on the Self-Monitoring Form (see example on Page 4).
2. Enter the previous dose counter reading from the previous Self-Monitoring Form and the date it was recorded. If this information is not available, leave that portion of the form blank or contact PRMD Well and Septic staff in the non-standard systems program at (707) 565-1691 to obtain the reading.
3. Subtract the previous reading from the current reading to obtain the doses over that period of time. Write this number in the "Number of doses" box.
4. Determine the number of days that have elapsed between the two monitoring dates. Write this number in the "Number of days" box.

Section D Instructions (without timer): Average gallons per day, see sample monitoring form on Page 5.

1. To obtain the average gallons per day pumped to the septic system, divide the number of doses by the number of days to obtain the number of doses per day. The gallons per dose for your septic system can be found located at the upper right portion of your Self-Monitoring Form. In addition, gallons per dose is printed on the Operational Permit for the non-standard septic system and is also located on the plans for the system.
2. Multiply the gallons per dose by the number of doses per day to obtain the gallons per day. Compare these gallons per day to the gallons per day the system is designed for. The designed gallons per day can be found at the upper right corner of the monitoring form, on the septic plans, or on the Operational Permit.

The system should be operating below the designed gallons per day. Operating above this design may cause the system to fail or shorten the life of the system. If the designed maximum flow is exceeded, check for plumbing leaks such as running toilets, review daily water use, and/or contact a septic contractor to assist in determining the cause for the high dose readings.

Section C, D and E Instructions (with timer):

1. The Orenco alarm box uses a timer and a scrolling LCD display. To obtain the dose numbers, use only the up/down arrows to find “D Pump Ct” (Discharge Pump Count) and “ETM” (elapsed time in minutes).
 - a. Write down the “D Pump Ct” number for the doses in the space for current dose count reading.
 - b. Write down the “ETM” in the space for current minutes/hours reading, which indicates how many minutes or hours the system has discharged to the leach field. The doses are set to last for a specified number of minutes or hours. The number of minutes or hours per dose should not change over time unless changed with approval from PRMD Well and Septic staff.
2. If the system has only an “ETM” or similar timer and no dose meter, follow these steps:
 - a. Determine the number of gallons pumped to the system. If, for example, the prior timer reading was 800 and is now 1,000, then 200 minutes, not doses, have elapsed.
 - b. Divide the number of minutes by the number of days since the previous reading (200 for example) and the answer is one minute per day. NOTE: Some timers display hours, be sure to check whether minutes or hours are displayed. See the example calculation below.

Example calculation: Number of **minutes** (200) divided by number of days (200) = 1 **minute** per day. Then multiply one **minute** per day by the designed gallons per minute*, for example 10 gallons per minute to obtain the answer of 10 gallons per day.

* The disposal rate in gallons per minute can be obtained from the consultant who designed the system, the contractor who installed the system, or from the approved septic system plans. The upper right portion of the Self-Monitoring Form includes the dose setting, not the time for the dose or the gallons per minute. It is highly recommended that the parameters of the system be reviewed with a service provider prior to scrolling through the LCD.

Instructions for drip systems (with flow meters) There may be one or two flow meters which can be found within the headworks, located within a Christy box. The flow meter on the return line reflects the gallons flushed through the system in order to clean out the lines.

To determine the amount of effluent being discharged to the leach field:

- a. Read the flow meter on the supply line, which is displayed in gallons.
- b. If there is a second flow meter (located on the return line) subtract those gallons from the supply line's flow meter reading. This total should be written in the space for “Current Dose Counter Reading in Section C”. Replace the word ‘dose counter’ with ‘gallons’ in this section.
- c. For this method replace ‘doses’ with ‘gallons’ on the first line of Section D. Additional entries are not necessary in the second line of Section D.

Note: The LCD screen does not need to be read if the system includes a flow meter. However, comparing the actual gallons per day (flow meter readings) with the LCD display of minutes lapsed, may indicate that the gallons per minute are decreasing over time. This is a useful diagnostic tool to determine if the drip emitters are plugged, thereby reducing the flow per minute.

General Condition of the System

Please note any maintenance and/or repairs performed, and who performed them, since the last monitoring, i.e. tank pumped, alarm repaired, pump replaced, system purged & balanced.

Additional Routine Maintenance Recommendations

Diversion Valves: Diversion valves switch the effluent flow between two or more separate leach fields. Often there will be two functioning leach fields separated by a diversion valve. Switching periodically between leach fields allows the leach fields to dry out prolonging their longevity. Often the system higher in elevation or above ground is utilized during the winter months in order to achieve a separation to ground water.

A diversion valve is either manual or automatic. A manual valve will often be found within an access container made of ABS, PVC, or corrugated pipe with an access lid at the ground surface. The valve will be located after

the sump tank or after the septic tank if there is not a sump tank. An automatic diversion valve is often found within a Christy box and may consist of valve levers controlled electronically (there will be wires connected to the valves) or a number of pipes exiting from a chamber such as with the Hydrotek valve.

To determine if a Hydrotek valve is operational:

- a. Have one person activate the pump and send one dose of effluent, and have a second person observe the effluent flowing through the clear piping exiting the valve during a dose.
- b. One person sends a second dose while the second person observes the effluent. The effluent should be traveling through a different pipe. If it is not, contact a qualified septic contractor for assistance.

Electronically controlled diversion valve: To determine if it is working, first ascertain when the valve is set to open. This information should be available from the approved septic plans or from the contractor or consultant who worked on the system. If the diversion valve is set to switch between fields after every dose:

- a. Observe which valves are open during a dose, and then observe if the valves rotate during the next dose. If they don't rotate between doses contact a qualified septic contractor.
- b. If the valves are not set to rotate after each dose contact the contractor or consultant who worked on the system for assistance.

Valve boxes: Locate the valve boxes, as shown on the approved septic plans. Check to see if they are filled with dirt or effluent and remove any excess dirt. Dirt will hinder the ability to adjust the valves when purging and adjusting is necessary. Effluent may indicate that a biomat is forming on the gravel bed and that the system needs purging and adjusting.

Vegetation: Follow proper vegetation practices. Refer to [WLS-017](#), Landscape Guidelines for Nonstandard Septic Systems.

Soil cover: Fill in any holes in the leach field area with a permeable soil similar to the existing cover.

Interceptor drains: Interceptor drains are sub-surface drains used to catch sub-surface water in order to divert it around the leach field. Not all septic systems employ an interceptor drain. If one is used, the location of the interceptor drain should be on the approved septic plans. Locate the outfall and the cleanouts, and clear any obstructions. The best time to check to see if the drain is functioning is during or right after a rainfall. Water should be running out of the outfall.

Expansion area: Determine if the system has an expansion area. For any new improvements such as, structures, driveways, drainage ways, horse corrals, etc. setbacks from the expansion areas must be met. For questions, contact PRMD Well and Septic staff prior to the start of work.

Pretreatment units: Determine if the system has a pretreatment unit and review the maintenance manual for service instructions. Make sure the unit is always turned on. When properly working no odors should be present when the unit is closed. If there are odors present when the unit is closed, contact a qualified septic contractor for assistance.

Drip Systems: For drip systems, refer to the maintenance manual if available. Check the approved septic plans for location of the drip system, including the headworks, located in a Christy box, and the air vent/vacuum breakers. Be sure that the headworks, and air vents are free of excess dirt. Check visible plumbing for any leaks. Check for wet areas within the system which may indicate a broken line, and if there are wet areas or plumbing leaks, contact a qualified septic contractor.

Additional information related to non-standard septic systems can be found online at the following locations:

[Guidelines for Maintaining A Non-Standard Septic System](#)

[Procedure for Purging and Adjusting a Pressure Distribution Septic System](#)

[Landscape Guidelines for Non-Standard Septic Systems](#)

[Maintenance Guidelines for Toilets on Non-Standard Sewage Disposal Systems](#)

Sample October Monitoring Form

Recommended Maintenance & Reminders:

1. Clean sump filter annually.
2. Pump septic tank every 3-5 years depending on use.
3. Purge and balance system annually by a C42 or engineering contractor familiar with these systems.
4. Switch diversion valve (if applicable) annually, or as specified on approved septic plans.
5. For those with pre-treatment units requiring sampling for analysis, see #7 on supplemental agreement, provide results to PRMD Well and Septic Section once per year for at least 2 years. Samples may be taken from sump tank.
6. Keep expansion areas unencumbered.

(A) On the back of this form, sketch a layout of your system. Please number the monitoring wells. A copy of the septic plans should be available from the designer/consultant who drew them or a plan should be available at the County for review.

Monitoring Well Information: *IMPORTANT - take readings in October ONLY*

Well number	Distance from the top of the ground to the top of the water (if dry, write "dry")	Well number	Distance from the top of the ground to the top of the water (if dry, write "dry")
1	23 inches	6	36 inches
2	22 inches	7	30 inches
3	<i>Dry (does not mean 0)</i> inches	8	inches
4	<i>Dry</i> inches	9	inches
5	<i>Dry</i> inches	10	inches

(B) Control/Alarm Box Information:

Does the system have a pump? Yes No Does Audible Alarm work? Yes No N/A
 Does the system have a Dose Counter? Yes No Does Alarm Light work? Yes No N/A
 Does Dose Counter advance in the manual mode? Yes No N/A

(C) Fill out the information below. If the alarm box has a dose counter and/or timer, just record the doses.

Current dose counter reading	1,000	Current minutes/hours reading	1,000	Today's date	10/15/07
Previous dose counter reading	800	Previous min/hr reading	800	Previous date reading	3/29/07
Number of doses	200	Number of minutes/hours	200	Number of days	200

(D) Dose Calculation:

Number of doses 200 divided by number 200 of days = 1 doses per day
 Times 100 gallons per dose* for your system = 100 gallons per day (for this specific time period)
 System is designed for: _____ gallons per day. System design flow has been exceeded Yes No ?

(E) Timer Calculation:

Number of min/hrs 200 divided by number 200 of days = 1 min/hr per day
 Times 10 gallons per min/hr* for the system = 10 gallons per day (for this specific time period).
 System is designed for: _____ gallons per day. System design flow has been exceeded Yes No ?

* Gallons per day and gallons per dose should be printed on the Annual Operational Permit, on the self-monitoring form, or on the septic plans. For those with a timer and no dose counter, the gallons per minute and minutes per dose can be found in the septic plan calculations. Make sure this reading is for the leach field, not the pretreatment unit.

General Condition of System - Note any maintenance and/or repairs performed, and who performed them, since the last monitoring, i.e. tank pumped, alarm repaired, pump replaced, system purged & balanced.

Monitored By: _____ Date: ___ / ___ / ___

Please complete this form any day within the month of October, then return to PRMD Well and Septic Section.

We suggest you keep a copy of this site inspection to complete future forms.

Our mailing address is:

County of Sonoma Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, CA 95403