

# Training Manual for Private Inspection/Evaluation Assessments

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Wastewater systems are inspected or evaluated for real-estate transactions by licensed individuals.

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## **General Introduction and Purpose**

The Missouri Department of Health and Senior Services' (DHSS) Onsite Wastewater Program (Program) licenses private individuals to inspect or evaluate onsite wastewater treatment systems (systems). These systems may have (1) existed prior to the construction standards effective date of January 1, 1996, (2) have been permitted according to state or county standards since January 1, 1996, or (3) have been exempt from permit requirements due to acreage.

The purpose of an inspection/evaluation is to assess the current function of a system under normal operational conditions for real estate transactions. The inspector only has a reporting obligation. The results of the assessment report should not be misinterpreted to conclude that any deficiency noted is a violation of state law. However, the system may be found in violation if the local health authority receives a complaint from an aggrieved party or adjacent property owner that the system presents a nuisance, or imminent health hazard. The local health officials would conduct an investigation to determine whether a violation exists.

The information in an inspection/evaluation report should be used as a tool for individuals to make an informed decision regarding the current condition of the system. Deficiencies noted may indicate a need for increased maintenance to keep the system functioning properly. It must also be clear to all parties that the assessment report does not impede the real-estate transaction from continuing.

### **Licensed Inspector's Responsibilities**

A licensed inspector's role is to report the condition of the system on the day of the assessment, which is not a regulatory function. Comments should not be written on the forms stating that the system is in violation of state law or local ordinance. Violations are generally not enforceable through real-estate assessments. However, if the authority receives a complaint from a neighbor or aggrieved person, the system may be found in violation and the owner will be required to bring the system up to current standards.

The client must be informed that repairs done on the system may require permits by the local or state authorities. Also, if recommendations for repairs are made, inform the owner they are not obligated to hire the inspector or anyone they represent to perform the work.

### **Onsite Wastewater Program's Responsibilities**

The role of the Program is to provide training and license private individuals to carry out the function of assessing systems for real-estate transactions. The focus of the licensing process is to assure the use of standardized practices, by state trained, competent, and knowledgeable people assessing the systems. Program staff will provide technical assistance regarding procedures and interpretation of inspection reports.

Complaints received against an inspector will be reviewed to determine whether administrative action should be considered.

### **Types of Assessments**

Inspections and Evaluations are the two methods authorized to assess components and the current operation of a system for real-estate transactions by DHSS licensed Inspectors. **Permitted systems shall not be assessed within six (6) months of installation as the permitting authority will have records.**

On the day of the system assessment, the tank(s) **must** be exposed to allow access to visually inspect the internal components. If the tank and all internal components are not accessible the inspector must indicate that as a deficiency. Although not required, it is recommended the tank be pumped for complete observation.

*Note:* On a report, **Asterisks (\*)** indicate items most critical to the long-term operation of the system. Critical items should not be ignored and may indicate the potential for a nuisance and/or public health risk.

## **Inspections**

An inspection provides a comprehensive assessment of the functionality of a system and all accessible components on the day of assessment based on current Missouri's Minimum Construction Standards and does not guarantee long-term functioning of the system.

A system, whether permitted or exempt from permitting, must be **in operation for at least six (6) consecutive months** prior to performing an inspection. Generally a new system will require time for normal biological processes to develop in the tank and soil treatment area. It is typically not expected that a system will malfunction within six months of installation, if best design practices and construction standards were adhered to. A complete inspection, after the system has been in operation for six (6) months or more, is the only assessment that can determine whether a system meets inspection criteria.

### Re-Inspection

A re-inspection may be performed after deficiencies have been corrected. Only the inspector who performs the original inspection can re-inspect the work performed. If a different inspector is hired, they must perform a separate complete inspection.

## **Evaluations**

An evaluation consists of assessing the tank(s) components and setback distances, including any signs of past or present system malfunction, not the functionality of the system as a whole. Evaluations do not indicate that the system meets inspection criteria. This kind of assessment is not as comprehensive as the inspection, and does not include a hydraulic test (HT). An HT must not be performed with an evaluation; however, a small volume of water (up to 50 gallons) should be introduced to confirm all plumbing fixtures are connected to the system. One-dose cycle shall be introduced to any media filter treatment unit to assure proper performance.

**This limited type of assessment is to be performed only when one or more apply:**

- System not in use for six (6) consecutive months.
- Property vacant more than 60 days.
- Access not obtained to soil treatment system on neighbor's property.
- New or replacement of system on exempt property within six (6) months of installation.

### Soil Survey

The soil survey is used in an evaluation to provide general soil information within a defined area. A soil survey also reports on possible soil limitations such as a water table being within the upper five foot (5 ft.) of a soil profile, and suitability of permeable soils. It is not intended to be site specific, however, it is generally expected that evaluated areas within a certain distance will have similar soil characteristics. Site specific soil morphology reports provide more accurate soil information.

## Assessment Procedures

### Step 1: Contact the Property Owner or Representative

- a. Interview the property owner or representative to obtain information regarding the location, vacancy/use and history of the system. Verify system components are on site. If components are off site, get permission to enter property to assess components. This information is vital to provide an accurate and complete assessment of the system.
- b. Be sure that the property owner, occupant, or their representative is aware of the day and approximate time that the assessment will be conducted.
- c. If available, obtain a copy of any permitting information from the property owner, representative, or administrative authority.
- d. Ask whether multiple structures are connected to the system. If so, calculate the daily flow to verify the total amount is 3,000 gallons or less. Flows systems with daily flows greater than 3,000 gallons, surface discharging systems, and lagoons that serve anything any structure other than a single-family residence are under the jurisdiction of the Missouri Department of Natural Resources (DNR) and cannot be assessed based on regulations set forth by the Missouri Department of Health and Senior Services.
- e. Request that the area be mowed and excessive vegetation, brush, old vehicles, trash piles and are removed prior to the site visit. This will assure any surfacing effluent that could be masked by excessive vegetation or other obstructions will clearly be visible.
- f. Check that a water source is available within the home to perform the required water sample when appropriate, and ensure that electrical power is turned on to the property.
- g. Advise the property owner to limit their water use the day of and the day after the inspection in the event that an HT is performed.
- h. Inform the property owner that the sewage tank(s) access covers must be exposed for a complete internal assessment to be performed. If the tank is not accessible an assessment cannot be conducted.
- i. Document the current weather conditions for the period within forty-eight (48) hours prior to the inspection/evaluation, specifically relating to conditions effecting soil wetness, which may have an effect on the current function of the system.

### Step 2: Conduct Site Visit

- a. Be aware of the effects that wet weather conditions have on the proper operation of the system. An assessment conducted after a heavy rainfall could make it difficult to determine if the soil treatment system is functioning properly or will accept an additional volume of water due to excessive soil saturation. If weather conditions cause excessive wetness in the soil treatment area, it is advisable to reschedule the assessment.
- b. In some cases, there are multiple signs of malfunctions. Document observations as completely and accurately as possible and use the comment section on the forms if needed.

- c. Provide a sketch of the site and system on the *Site Diagram* form.

### **Step 3: Assess the Treatment Unit**

- a. Locate all treatment components, including the septic tank, aerobic treatment unit bio media treatment unit, wetland, and pump tank(s), etc.
- b. Refer to the appropriate treatment unit checklist form for each unit and complete the form(s).
- c. Remove the manhole cover and inspect the internal components as described on the assessment form(s). If components cannot be observed, inform the owner that the condition of components cannot be determined, and it is considered *unacceptable*.
- d. Verify all wastewater (including gray water) is plumbed to the system.
- e. If the tank is pumped prior to or during the assessment, make sure the water level is at the normal operating depth prior to performing the HT (for inspections only).

### **Step 4: Assess the Soil Treatment System and Surrounding Area**

- a. Before water is introduced into the system, first conduct a thorough walk over the soil treatment area.
- b. If the location of the soil treatment area is suspected to be off site, walk the boundaries of the property and make observations for obvious signs of a malfunctioning system. Do not trespass on neighboring property. Obtain permission from the neighbor to cross their property for further assessment if necessary. If access to a neighbor's property cannot be obtained, and it is believed that the system is on that property, indicate in notes that the location of the soil treatment system is suspected to be off site. **Do not perform an HT** and conduct an evaluation.
- c. Look for wet spots or spongy soil, discharge pipes, tall grass/weeds, black areas where no vegetation will grow or where growth is uneven etc. These could be obvious signs of past or current malfunction.
- d. Determine whether surfacing effluent is flowing onto the property from an adjacent property. This could potentially be investigated by the administrative authority if the owner contacts them to file a complaint.
- e. Turn-up pipes and yard boxes will help with locating the absorption field for pressure dosed conventional systems and advanced distribution systems such as a low-pressure pipe systems and subsurface drip dispersal systems.
- f. If accessible, the distribution box needs to be assessed for water tightness and even distribution of effluent.

### **Step 5: Perform a Hydraulic Test (HT) (Inspections only)**

The purpose of the HT is to determine the capability of both the treatment unit and the soil treatment system to handle a water load. Before performing an HT, it is extremely important to know if the system has been in use for at least six (6) consecutive months to determine whether the test may be performed. During an HT the inspector must be able to examine the plumbing configuration and have access to all fixtures that use water. Access must be available to the interior of the treatment unit in order to determine the effect of water usage on the unit. It may be necessary to introduce a dye element into the tank to trace flows and check for leakage.

- a. Determine whether to use dye prior to the HT. (*See Step 6 for instructions*)
- b. Systems must be in operation for a period of at least six (6) consecutive months to perform an HT. **Do not perform Hydraulic Test, on homes vacant more than 60 days.** Results from an HT performed on properties vacant more than 60 days, may provide inconclusive and inaccurate information.
- c. Systems serving properties that have been vacant more than 60 days must be back in operation for six (6) consecutive months to perform the HT.
- d. After thoroughly assessing the soil treatment area and tank, introduce water to determine whether the system can accept the prescribed hydraulic load.
- e. For **conventional systems** introduce water at the following rates.

**RESIDENTIAL:**

1. Homes presently lived in and homes vacant up to 30 days.
  - a) 1-2 bedroom 120 gallons
  - b) 3 bedroom 180 gallons
  - c) 4 bedroom 240 gallons

Add 60 gallons of water per each additional bedroom. Water should be introduced at a rate of approximately 5 to 10 gallons per minute. **All sewage tanks must be at normal operating levels before the HT is performed.**

2. Homes vacant 31 days up to 60 days
  - a) Introduce 1.5 times the water volumes listed above.

**COMMERCIAL:**

3. Businesses in operation or closed for up to 30 days.

Refer to Table 2A-Quantities of Domestic Sewage Flows in the *Missouri Laws Accompanied by Department of Health and Senior Services Rules Governing Onsite Wastewater Treatment Systems* (also called “The Green Book”) to calculate daily flow. Also available on our website at:

[http://health.mo.gov/living/environment/onsite/pdf/onsite\\_ref\\_book.pdf](http://health.mo.gov/living/environment/onsite/pdf/onsite_ref_book.pdf) .

- a) Introduce a water volume of one-half (1/2) the daily flow from all fixtures up to a maximum of 500 gallons of water.
4. Businesses vacant 31 days up to 60 days
  - a) Introduce 1.5 times the calculated water volume.
- f. For **alternative systems** on a home or business, use enough water for one dose cycle. For homes vacant 31-60 days, introduce 2 dose cycles.
- g. Large volumes of water should not be run through ATU’s.
  1. Run approximately 50 gallons of water from a water source through the ATU. Note any observations.
  2. To complete the HT, introduce the remaining water volume by way of bypassing the ATU.

- h. Water added to the system for well sampling should be accounted for when determining the flow for the HT; this is to minimize the possibility of a hydraulic overload to the system during the assessment. It is suggested that a method of verification on the amount of water used when performing a system inspection be put into practice and noted on the report.
- i. During the test, watch how influent enters the tank. Determine if the water level rises above operating level at the outlet of the tank. For example, observe whether water is slow draining, or backs up into the inlet pipe.
- j. If influent floods the tank, stop all sources of flow as quickly as possible. Document this condition and make accurate notes regarding what was observed.
- k. In the case of a straight discharge pipe, the inspector only needs to identify that there is a direct connection from the system to the discharge pipe. Adding dye in this situation might be appropriate. Do not assume that a pipe to the surface is connected to the system as some pipes could be associated with a curtain drain, roof gutter spout, basement or garage floor drains, or foundation drain. Be sure that what is reported is accurate. Referring to those as a straight discharge pipe would be inaccurate.
- l. To perform an HT on a **shared system** it should be determined that easements are in place to ensure access to the system. Whether it is the tank or the field, the inspector must have complete access to the system. When two structures share a field, the HT must be performed based on the criteria for the individual structure that is inspected. For example, if there are two (2) separate three-bedroom homes connected to the same system, and one home is to be inspected, run the amount water required for one home that is for sale. Then write comments that the system is shared which might affect the results. Do not increase the HT volume by a factor of 1.5 when the house has been vacant for 31-60 days if the other home is occupied because the system will continue to be in operation by the neighboring home. If the other home is vacant, then you will increase the flow of the HT by a factor of 1.5 because the system has not been in use by either home.

## Step 6: Dye Testing

- a. **Be conservative.** When a system is not functioning properly, there are likely obvious signs relating to current and past functioning of a system.
- b. Prior to dye test, contact a Department of Natural Resources (DNR) Geological Survey Program at (800) 361-4827 regarding the location, date and time of test. This is to ensure that no other tests are being conducted in the area that may interfere with DNR ground water tracing results.
- c. Be aware of the effects that bleach in a system will have on the dye element. A high concentration of chlorine can create a false reading by dissipating the dye.
- d. It is important to correctly interpret and understand the results obtained by performing a dye test. Observing dye after a dye test is normally a good indicator that there is a hydraulic connection between the tank and the soil surface near the soil treatment system, the lake, pond or stream, or a discharge pipe.
- e. An **alternate dye test** may be performed on properties that meet **all** of the following requirements:

1. Vacant more than 60 days;
2. When the system is situated on a lot that does not meet the required setback distances; and
3. The property is adjacent to a lake or stream.

The purpose for this alternate test is to rule out any direct connection to the body of water and the soil treatment system when the lot size appears to be too small. Apply no more than the total volume for 0-30 days. **The alternate dye test is only valid for the above-mentioned situation and cannot be used for any other reasons.**

### **Step 7: Assessing a Private Wellhead and Water Sampling**

- a. An assessment of the above-ground wellhead construction must be performed, and a water sample taken from a private drinking water source any time a wastewater system assessment is conducted. A private drinking water sample is not taken if the system is not assessed. **Do not sample public drinking water sources or any water supply system serving 8 or more connections.**
- b. Wellhead construction standards only apply to drilled wells. Inspect the above ground construction of the wellhead using the form for well construction. Other private drinking water sources (e.g. a bored well, sand point well, lake or stream and cistern) of water must have a sample taken without performing a construction assessment.
- c. Bypass water softener or disinfection units if possible when sampling.
- d. A [drinking water sample](#) should be taken from the point of consumption. This is to ensure that the water supply pipes between the well and the point of consumption are represented by the sample.
- e. If chlorine is detected in the water supply do not sample and mark *unacceptable*. Excessive chlorine residual in a sample cannot be submitted for analysis.
- f. If the results of the water sample returns positive for bacteria, advise the client that the well should be chlorinated and re-sampled one (1) week after chlorination. Two (2) consecutive samples taken one (1) week apart must be satisfactory after [disinfection for the water supply](#) to be considered suitable for drinking. **It is not the inspectors/evaluators responsibility to disinfect the well.**
- g. **Only** the inspector who performs the initial sample may take the subsequent re-samples if needed. A different inspector will need to perform the entire inspection/evaluation process with their signature on the report, including all forms associated with it.
- h. If a satisfactory sample cannot be achieved, there may be a problem with the wellhead construction (such as a cracked wellhead, unscreened vent, etc.), or a direct connection with the wastewater system itself. There are a number of factors that may affect well water quality. Recommend that the owner consult a licensed well driller or water treatment company for additional information.

### **Step 8: Prepare to Leave Site**

- a. When completing the assessment, clean up the area where you worked. Return the site as close to its original state as practical. Be sure that control panels are locked and in original conditions. **Be sure that all lids are secure against accidental access.**

- b. Be safe and practice good personal hygiene by washing hands and keeping them away from your face. Disinfect and wipe off equipment used in performing an assessment.

### **Step 9: Complete All Applicable Assessment Checklist Forms**

- a. Complete all applicable assessment forms including the *Site Information* form.
- b. Summarize all findings of your assessment on the *Assessment Results* form.
- c. Make sure that water samples are submitted to a certified lab within the required time (for private well samples). Results must be included on the report.
- d. **Copies of the reports must be submitted to DHSS, the local administrative authority, the requesting party and the property owner.**

### **Inspection/Evaluation Checklist Review**

These forms have been designed and formatted for quick entry of information and to be used as a checklist during an inspection or evaluation. All questions are written to have a *Yes* response if current state minimum standards are met for that particular system component. When any system component criteria does not meet state standards and *No* is marked, the system as a whole does not meet the inspection/evaluation criteria.

**Site Information Form:** Everything on this form must be completed except the latitude and longitude information. The Program would like to acquire the latitude and longitude information if available; however, it is not a requirement.

**Facility Information Section:** The *Type of Facility* must be completed, and the number of bedrooms reported must not be less than the number reported on the real estate listing. Report all other information in this section if available.

**System History Section:** Information in this section may be completed based on the interview of the property owner, or their representative.

**Licensed Inspector Signature Section:** The printed name and signature is required on the OWTS *Assessment Results* form. The license identification number issued by DHSS must also be on the form. Each assessment report should have a unique identifiable job number that you create. For example, it can be a series of numbers beginning with 100 or the client's last name and date. Do not make the number too long or so cryptic that you cannot remember whose report it is.

**Assessment Results Form:** The type of assessment must be indicated by checking the appropriate box.

**Water Supply Section:** The construction standards of the water supply section of the assessment form is for private wells only. The water sample results is for all private wells regardless of construction standards. A separate checklist form must be completed for all private wells. Re-sampling after a bad sample is at the option of the property owner.

**OWTS Components Section:** This section has a number of tank/treatment options which indicates an individual form for each OWTS component. There may be a combination of boxes checked. The separate individual checklist form will provide details of the assessment any possible deficiencies that may affect the operation of the system. This section also has a variety

of dispersal options with a separate checklist form for additional information.

**OWTS Assessment Results Section:** This is the last part of the assessment form which summarizes the overall results from the checklist forms. The information is based on the condition of the system at the time of assessment.

*Minimum Setback Distances* - It is not expected that the inspector will know the exact boundaries of the property however every effort should be made to determine the approximate location of the property lines based on information provided from the property owner or their authorized representative. In addition to this answer being reported, a more detailed checklist form must be completed.

Whichever type of assessment is performed (inspection or evaluation), the overall results of the OWTS meeting the criteria is noted here. Additional forms are to be completed which will provide additional information. The type of deficiency found is noted here (if applicable).

**Submission of reports** (within 30 days of completion) must be submitted to DHSS by:

- 1) Electronically to: [OnsiteProgram@health.mo.gov](mailto:OnsiteProgram@health.mo.gov)
- 2) Mail to: **Missouri Department of Health and Senior Services, Onsite Wastewater Program, PO Box 570, Jefferson City, MO, 65102**

If you have any questions, contact the Onsite Wastewater Program at (573) 751-6095 ext. 5.