Introduction

NSF International (NSF) offers a program designed to verify the proficiency of individuals performing inspections of existing onsite wastewater treatment systems. This accreditation program includes a written and a practical examination, as well as continuing education activity.

Individuals demonstrating competency in accordance with the NSF Policies for Accreditation of Onsite Water and Wastewater Inspector Accreditation Program will be designated as accredited. Their names will be published on the NSF International World Wide Web site and in the NSF Listing book, available to industry, users, regulators and other interested individuals. Accredited individuals will also have access to the NSF Mark, for use in advertising, promotional materials, and inspection reports.

Program Components

The program has six basic components:

1. Application

The application form identifies minimum information necessary to establish candidate records with NSF. The form also makes reference to documentation for submittal along with the completed application. These include (1) verification of high school diploma or equivalent, and (2) either completion of an onsite wastewater inspection training course or verification of experience performing onsite wastewater system inspections. For verification of experience, copies of five inspection reports signed and completed by the applicant, and covering a 12-month period, must be submitted.

2. Written Examination

Upon receipt of a fully completed application, a time and place for the written examination is arranged. The written examination can be administered at locations throughout the United States and Canada. Acceptable options include public libraries, colleges and universities, and other similar locations.

The written exam covers a broad range of topics relating to onsite wastewater inspections, as detailed in the Program Outline found in this Guide. The examination is open book, allowing the candidate to have full access to all materials they bring to the examination.

The examination consists of 100 multiple choice questions. Each question has only one correct answer. The applicant is allowed three hours to complete the examination. Upon completion, both the test and answer sheet are given to the proctor, who then returns both to NSF for grading. NSF will then notify the candidate of their score.

3. Practical Examination

After successfully completing the written examination, the applicant proceeds to the practical examination. This examination is administered at an existing onsite wastewater treatment system installation, and is proctored by an NSF representative. The candidate is evaluated for their ability to gather all of the appropriate information identified in the inspection checklist, properly conducting and recording a complete onsite inspection. A copy of the check-list is provided in this Guide. The candidate is expected to provide any equipment needed to complete the inspection. The candidate’s ability to operate this equipment will also be graded during the examination.

4. Ethics Statement

Another important component of the NSF Accreditation Program is the signing of an ethics statement by accredited onsite inspectors. This statement must be signed and submitted to NSF before the accreditation can be granted. In signing this statement, the applicant pledges to maintain a high level of honesty and integrity as he or she performs their evaluation activities.

5. Contractual Relationship

When the above four obligations are satisfied, the applicant and NSF enter into a contractual agreement. This agreement provides NSF with assurance that the accredited inspector will abide by program policies and provides the accredited inspector with authorization to use the NSF Accreditation Mark.

6. Continuing Education

Accredited inspectors must requalify at intervals not to exceed five years. Requalification is accomplished by successfully completing the written and practical examinations or earning sufficient requalification units (RUs) through programs and activities of continuing education. RU credits may be earned by participation in professional associations and approved training courses, as well as other activities approved on a case by case basis.

Exam Scoring

To pass the written examination, the candidate must correctly answer at least 75 percent of the test questions.
To successfully complete the practical examination, a candidate must attain an overall minimum score of 75 percent, as well as a minimum of 70 percent of the possible points in each of the treatment tank and the soil absorption system evaluations.

Following a failure of either the written or practical examination, the candidate must wait at least 30 days before retaking that examination. Following a second successive failure of either examination, an individual must participate in an onsite wastewater inspection training program prior to retaking the examination.

**Recommended References**

The following references will be helpful in preparing for both the written and practical examination.


Hoover, Michael T., et al. *Onsite Wastewater System Operation and Maintenance (Operator’s Guide TRPMCD11).* (Available through the National Environmental Training Center for Small Communities; 1-800-624-8301)


Riordan, James, M. *Septic System Checkup: The Rhode Island Handbook for Inspection.* (Available online at [www.state.ri.us/dem/regs/water/isdbook.pdf](http://www.state.ri.us/dem/regs/water/isdbook.pdf) or through the Rhode Island DEM Office of Technical Customer Assistance, 1-401-222-6822)

National Small Flows Clearinghouse Pipeline Publications (All available through National Small Flows Clearinghouse, 1-800-624-8301):

**Summer 1995, Vol. 6, No. 3**

*Septic Systems-A practical alternative for small communities*

**Winter 1996, Vol. 7, No. 1**

*Home Aerobic Wastewater Treatment: An Alternative to Septic Systems*

**Summer 1996, Vol. 7, No. 3**

*Wastewater Treatment Protects Small Community Life, Health*

**Spring 1997, Vol. 8, No. 2**

*Lagoon Systems Can Provide Low-Cost Wastewater Treatment*

**Summer 1997, Vol. 8, No. 3**

*Sand Filters Provide Quality, Low-Maintenance Treatment*

**Fall 1997, Vol. 8, No. 4**

*Basic Wastewater Characteristics*

**Spring 1998, Vol. 9, No. 2**

*Inspections Equal Preventative Care for Onsite Systems*

**Summer 1998, Vol. 9, No. 3**

*Constructed Wetlands: A Natural Treatment Alternative*

**Additional Reading**


USEPA Decentralized Systems Technology Fact Sheet: Septage Treatment/Disposal (EPA 832-F-99-068)

USEPA Decentralized Systems Technology Fact Sheet: Mound Systems (EPA 832-F-99-074)

USEPA Decentralized Systems Technology Fact Sheet: Low Pressure Pipe Systems (EPA 832-F-99-076)

USEPA Storm Water Technology Fact Sheet: Sand Filters (EPA 832-F-99-007)

USEPA Wastewater Technology Fact Sheet: Intermittent Sand Filters (EPA 932-F-99-087)

USEPA Water Efficiency Technology Fact Sheet: Incinerating Toilets (EPA 832-F-99-072)

USEPA Water Efficiency Technology Fact Sheet: Composting Toilets (EPA 832-F-99-066)
Program Fees

2009 Fee Schedule (Subject to change)

1. Application and written exam fee - per individual $95

2. Practical examination - per individual $395

3. Annual accreditation fee - per individual (applied January 1 of the first year following accreditation) $195

Questions/Comments

For questions or comments please contact Sharon Steiner in the program office at (734) 827-6846 or via e-mail at steiner@nsf.org. You may also visit NSF International on the World Wide Web at www.nsf.org.
NSF Onsite Water & Wastewater Inspector Accreditation Program
Application for Accreditation

To be completed by applicant: Date: ________________

1. Name: □ Mr. □ Mrs. □ Ms. □ Dr
   (Name and address as it is to appear in published Listing)
   
   Company Name: ____________________________________________
   Address __________________________________________________
   City ___________________________ State/Country: ___________ Zip Code: ______
   Telephone: ___________________ Fax: __________________________ 800: ______

2. Home Address: _______________________________________
   City: ___________________________ State/Country: ___________ Zip Code: ______
   Telephone: ___________________ E-mail address: ____________________

   Please circle the method(s) that can be utilized to relay information to your company.
   It is the responsibility of the client to notify NSF of any changes.
   E-mail        Facsimile       Standard Mail

3. Qualifications (check and attach)
   • Proof of high-school diploma or equivalent; and
   • Written evidence of one year active field experience conducting onsite inspections OR completion of a training course.

4. A check in the amount of $95.00 (USD) is enclosed for the non-refundable application and written examination fee. Charges for the practical examination will be invoiced and paid prior to the exam. Charges for Accreditation services must be paid along with the signing of the "Contract for Accreditation Services," which will be executed upon satisfactory completion of all requirements for accreditation.

5. Affidavit:
   I certify that I have read and agree to comply with the NSF Onsite Water and Wastewater Inspector Accreditation Program Policies and I am authorized to apply for my evaluation by NSF in connection with services I perform. I am further authorized to agree that I will pay NSF for any charges billed for services rendered in the evaluation and/or testing for accreditation.

6. Release of liability and indemnity agreement:
   I agree, as a consideration of, and in consideration for, being permitted to participate in the NSF International Accreditation Program and being permitted to utilize the resources of the NSF Program, its proctors and its teaching and accreditation materials, that I freely and expressly assume and accept any and all risks of injury to me or my property. (Please initial __________________________)

   I agree that I am releasing NSF International, its agents, employees, directors, officers, shareholders and insurers from any and all responsibility or liability for injuries or damages which result in any way from my participation in this Program. I agree not to make a claim against or sue NSF International or its agents for injuries or damages relating to the Program. (Please initial _________)

   I am aware that this is a release of liability and a contract between me and NSF International. I recognize and agree that this agreement is binding upon me, my heirs and assigns. (Please initial ________________)

"Contract for Accreditation Services"
I agree that I will indemnify NSF International for any and all claims for injuries or damages which result in any way from my participation in the Program. This includes claims by others against NSF International resulting from my participation in the Program. I will hold NSF International harmless from and for any such claims. (Please initial ______________________________)

I, THE UNDERSIGNED, HAVE CAREFULLY READ THIS RELEASE OF LIABILITY AND FULLY UNDERSTAND ITS CONTENTS.

__________________________________________  ____________________________  ____________________________
Signature                      Date                      Print Name and Title

Please return to: Sharon Steiner, NSF International, 789 Dixboro Rd., Ann Arbor, MI  48105
Onsite Water and Wastewater Inspector Accreditation Program
Program Outline

Onsite Wastewater

1. Key Terminology

Absorption
Aerator
Aerobic
Air bound
Airlift
Ammonia
Anaerobic
Area
Biochemical Oxygen Demand
Blinding
Chemical Oxygen Demand
Chlorination
Disinfection
Dissolved Oxygen
Domestic wastewater
Dosing chamber
Dosing siphon
Effluent
Evapotranspiration system
Fecal coliform
Flow/discharge rate (Q)
Gray water
Head

Industrial wastewater
Infiltration
Influent
Inorganic
Invert
Long term acceptance rate (LTAR)
Low pressure pipe (LLP)
Nitrate nitrogen
Nutrients
Organic
Organic nitrogen
Orifice
Pathogens
pH
Permeability
Percolation
Pressure manifold
Total Kjeldahl nitrogen
Total solids
Total suspended solids
Unsaturated flow
Wastewater

2. Basic Mathematics and Calculations

2.1. Important conversion factors:

<table>
<thead>
<tr>
<th>Multiply</th>
<th>By</th>
<th>To Obtain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acre</td>
<td>43,560</td>
<td>square feet</td>
</tr>
<tr>
<td>Cubic feet (ft³) of water</td>
<td>7.48</td>
<td>gallons</td>
</tr>
<tr>
<td>Inches of mercury (Hg)</td>
<td>1.131</td>
<td>feet of water</td>
</tr>
<tr>
<td>Pounds per square inch (psi)</td>
<td>2.31</td>
<td>feet of water</td>
</tr>
<tr>
<td>Feet of water</td>
<td>0.434</td>
<td>psi</td>
</tr>
<tr>
<td>Gallons per minute (gpm)</td>
<td>1440</td>
<td>gallons per day (gpd)</td>
</tr>
</tbody>
</table>

2.2. Important equations:

Volume of rectangular/square tank (cu. ft.) = \( l \times w \times d \) \( \text{[(length, ft.)(width, ft.)(depth, ft.)]} \]

Volume of a round tank (cu. ft.) = \( \pi r^2 \times d \) \( \text{[(3.14)(tank radius, ft)(tank radius, ft)(tank depth, ft)} \)

1 cubic foot = 7.48 gallons

Detention time (hrs.) = \( [(Q \text{ in gpd)} ÷ \text{(tank volume in gallons)}] \times 24 \text{ hrs/day} \)

Hydraulic soil loading rate (gpd/ft²) = \( \text{gallons applied per day (gpd) ÷ applied area (ft²)} \)

Pump delivery rate (gpm) = \( \text{volume pumped (gal)} ÷ \text{pump run time (min)} \)

Pump delivery rate efficiency (%) = \( [(\text{measured pump delivery rate}) ÷ \text{(design pump delivery rate)}] \times 100\% \)
3. **Program Policies**

3.1. Refer to NSF Program Policies

4. **Safety**

4.1. Safety hazards
4.2. Personal hygiene
4.3. Physical injury prevention
4.4. Confined space entry
4.5. Electrical hazards
4.6. Digging hazards
4.7. Biological hazards
4.8. Explosive or poisonous gases
4.9. Ventilation
4.10. First aid

5. **Sewage Treatment and Disposal Systems**

5.1. **General System Information - basic process operation**

5.1.1. Wastewater disposal systems (discussion of basic process and specifics of failure)

Subsurface treatment systems:
- Absorption trench systems
- Absorption bed systems
- Deep absorption trenches
- Shallow absorption trenches
- Graveless absorption systems
- Chamber systems
- Cut and fill systems
- Seepage pits

Alternative systems
- Raised system
- Mounds
- Artificially drained systems
- Sand filters
- Peat filters
- Biological filters
- Evaporation-transpiration (ET) and evaporation-transpiration absorption (ETA) systems
- Septic drip distribution
- “Clean” drip distribution
- Aerobic units

Other Systems
- Disinfection systems
- Holding tanks
• Non-waterborne systems
• Surface discharge
• Recycle/reuse systems
• Incinerating toilets
• Gray water systems

5.1.2. Description of basic processes in subsurface system function

5.1.2.1. Wastewater absorption into and through the soil
5.1.2.2. Wastewater treatment in the soil
5.1.2.3. Formation and effects of clogging mats
5.1.2.4. Effects of soil properties on wastewater loading rates
5.1.2.5. Effects of groundwater on disposal and treatment

5.1.3. Soil and site appraisal and its relationship to functioning onsite systems

5.1.3.1. Hydrologic cycle
5.1.3.2. Soil properties and characteristics
5.1.3.3. Separation requirements
5.1.3.4. Soil investigation
5.1.3.5. Soil long term acceptance rate (LTAR)
5.1.3.6. Site information, groundwater, well location and construction
5.1.3.7. Seasonal high groundwater
5.1.3.8. Landscape positioning and its relationship to functioning onsite systems
5.1.3.9. Site drainage

5.2. System Design Basics

5.2.1. General Information

5.2.1.1. Sizing of system
5.2.1.2. Absorption system location
5.2.1.3. Subsurface drainage facilities
5.2.1.4. Choice of treatment systems
5.2.1.5. Materials
5.2.1.6. Depth of system and grades of lines
5.2.1.7. Surface drainage
5.2.1.8. Groundwater infiltration

5.2.2. House or Building Sewer

5.2.2.1. Size and slope
5.2.2.2. Materials

5.2.3. Septic Tanks

5.2.3.1. Location

5.2.3.2. Design and installation

5.2.3.3. Multi-compartment tanks or tanks in series

5.2.3.4. Precast reinforced concrete tanks

5.2.3.5. Cast-in-place concrete tanks

5.2.3.6. Fiberglass and polyethylene tanks

5.2.3.7. Steel tanks

5.2.3.8. Leaking tanks

5.2.3.9. Baffles, outlet devices, effluent screens

5.2.3.10. Operation and maintenance

5.2.4. Effluent Distribution Systems and Devices

5.2.4.1. Supply lines (gravity or pressure)

5.2.4.2. Distribution devices
  • distribution box
  • drop boxes
  • dosing siphons
  • flow-divider tee
  • dual alternating dosing siphon
  • ball valve
  • tipping D-box
  • automatic distribution valve

5.2.4.3. Serial distribution

5.2.4.4. Drain field laterals

5.2.4.5. Drain field lateral hole size

5.2.4.6. Drain field stone

5.2.4.7. Lateral turn-ups

5.2.4.8. Pumped systems

5.2.4.9. Pressure distribution and dosing

5.2.4.10. Large diameter pipe system

6. Sampling

6.1. Techniques to collect appropriate samples

6.2. Coliform bacteria
6.3. Ammonia nitrogen and nitrate nitrogen

6.4. Volatile organic compounds (VOCs)

7. **Inspection Procedures**

7.1. Public relations training

7.2. Safety plan

7.3. Contact local health department

7.4. Authorization form to owner - up front discussion of homeowner information and responsibilities

7.5. Checklist

7.6. Site plan

7.6.1. Reading existing plans and need for “as-built” drawings

7.6.2. Creating new plans

7.7. Inspection procedures, helpful tools, methods, etc.

7.7.1. Site evaluation

7.7.1.1. Landscape positioning in relation to onsite system

7.7.1.2. Surface water drainage and final grading

7.7.1.3. Location of well relative to onsite system

7.7.1.4. Previous use

7.7.1.5. Previous permits

7.7.2. House sewer

7.7.2.1. Leaking or damaged

7.7.2.2. Susceptible to root intrusion

7.7.3. Septic tank

7.7.3.1. Tank construction and installation

7.7.3.2. Water tightness

7.7.3.3. Baffles

7.7.3.4. Outlet devices

7.7.3.5. Tank dimensions and capacity

7.7.3.6. Flow, settling and bacterial action

7.7.3.7. Depth of water, scum and sludge layers in relation to outlet invert

7.7.3.8. Frequency of tank pumping and when was tank last pumped

7.7.3.9. Odor
7.7.3.10. Effluent quality
7.7.3.11. What to do if house has not been occupied for a period of time
7.7.3.12. Pump systems in septic tank

7.7.4. Soil Absorption System

7.7.4.1. Lift station
7.7.4.2. Drop boxes and distribution boxes
7.7.4.3. Piping
7.7.4.4. Soil
7.7.4.5. Depth below ground surface
7.7.4.6. Surface water
7.7.4.7. Soil system failure - surfacing effluent
7.7.4.8. Setbacks
7.7.4.9. System sizing
7.7.4.10. Susceptible to root intrusion

7.7.5. Alternative Systems

7.7.5.1. Sand filters
  • flow distribution
  • surface conditions
  • ponding water
  • under drains
  • pump chamber, pump, timers, floats

7.7.5.2. Mound systems
  • lift station
  • piping
  • surface water
  • water breaking out of side of mound

7.7.5.3. Aerobic systems
  • maintenance contract in place
  • odors in system
  • operation of mechanical systems
  • signs of high water level or overflow
  • solids depth in pretreatment tank
  • solids concentration in aeration chamber
  • effluent quality

7.7.6. Pump inspection
7.7.7. Cesspools
7.7.8. High groundwater or bed rock determination
7.7.9. Difficulty in locating components
7.8. Red flags indicating possible problems

7.9. Step by step inspection procedure

7.10. Varying inspection procedures

7.11. Report

7.12. Record keeping
NSF Onsite Water and Wastewater Inspector
Accreditation Program
Wastewater Treatment System Inspection Checklist

I. General Property Information: Date requested: _______

1. Inspection requested by: ________________________________
   Billing address: ________________________________

2. Property address or identification number: ________________________________

3. Weather conditions at time of inspection:
   ________________________________

Information obtained from interview:

4. Name of person interviewed: ________________________________
   Original owner: ______ yes ______ no
   Age of home (years): ______________
   Number of bedrooms: ________________________________
   Number of bathrooms: ________________________________
   Last known date of occupancy: ______________ Number of occupants: ______
   Total lot size: ________________________________
   Seasonal use only: ______ yes ______ no
   Are all wastewater facilities within the property lines? ______ yes ______ no ______ unknown

5. General observations of surrounding topography: ________________________________

Additional comments/observations:

II. Sewage Disposal System Information:

Health Permit Number __________________

Permit restrictions: ______ yes ______ no
   If yes, describe: ________________________________

Is a plan of the sewage system available? ___ yes ___ no

1. Description of complete system including all components for storage, treatment and disposal: ________________________________
   ________________________________
   ________________________________
   ________________________________

2. Water using appliances present (check all that apply):
   ___ washing machine discharged to: ____________________ Average loads/week: ______
   ___ water softener discharged to: ____________________
   ___ whirlpool bath discharged to: ____________________
   ___ spa discharged to: ____________________
   ___ garbage disposal discharged to: ____________________
   ___ dishwasher discharged to: ____________________
___ iron filter discharged to: __________________
___ hot tub discharged to: __________________
___ dehumidifier discharged to: __________________
___ other discharged to: __________________

3. Age of sewage disposal system: _______ years

4. List known repairs, including date, made to the system:

________________________________________
________________________________________

5. Is there a service agreement? _____ yes _____ no
   If so, with whom and frequency of service? _______
   List components of service agreement: __________________

________________________________________

6. Date the septic tank was last pumped? __________________

7. Is an in-house sump present? _____ yes _____ no
   Discharged to: __________________

Additional comments/observations:
III. **Sketch of System:** 8N

Show location of sewage system in relation to building it serves, reference points (roads, fences, other buildings), above ground utility lines, wells, and surface water.
### IV. Evaluation Procedures:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Located, accessed and opened tank covers on inlet and outlet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>depth of tank below grade</td>
<td></td>
<td></td>
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</tbody>
</table>

**Observed condition of the following:**

- Effluent filter
- Inlet device
- Outlet device
- Tank cover
- Liquid level
  - *Liquid depth* __________
  - *Sludge depth* __________
  - *Scum depth* __________
- Distribution line between tank and absorption system
- Condition of treatment tank(s)?
  - *water tight*?
- Diversion valve present?
  - If yes, frequency of alternation?
- Does system contain a dosing or pump tank, ejector or grinder pump?
  - If yes: Location?
- Does the pump appear to be operating properly?
- Is there a high water alarm?
- Can the alarm be activated?
- Is there any evidence of surface water infiltrating into pump chamber?
- Is there a distribution box? If yes, describe:

Depth of liquid above outlet invert __________

Is there a dosing siphon?

**Description of wastewater disposal system(s):**

**Absorption system:**

- _____ laterals; _____ # _____ bed
- Absorption area: __________ ft²
- _____ footer
- _____ # of laterals
- _____ lateral turn ups
- _____ length of laterals

Soil absorption system probed to check for excessive moisture, odor and/or effluent?

Result of investigation into soil absorption system:

- Sludge in soil absorption system?
- Liquid encountered?
- Stone black?
- Depth of cover over soil absorption system?
- Soil absorption system subject to root intrusion?
- Building sewer leaking?
- Subject to root intrusion?
Yes  No  N/A  Other observations:
___  ___  ___  Leaking fixtures and/or plumbing?
___  ___  ___  Seepage visible on lawn?
___  ___  ___  Lush vegetation present?
___  ___  ___  Ponding/standing water in aggregate?
___  ___  ___  Even distribution of effluent in field?
___  ___  ___  Does gray water discharge onto ground or into a stream?
___  ___  ___  Vegetation in or near soil absorption system?

Describe observations of water table or saturated soil conditions:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Approximate distance between water well and soil absorption system (locate on sketch of system) ______ ft.

V. Other comments/site observations:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Educational material provided to owner:  ____ yes ____ no
Type of materials:  ____________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
VI. Inspection Conclusions:

________________________________________________________________________

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Inspector’s Signature ______________________________________ Date ______________