



Livingston County Department of Public Health  
Environmental Health Division

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# Minimum Requirements for Alternative On-Site Sewage Treatment Systems

Prepared June, 2006  
Revised October 21, 2016

**Alternative On-Site Sewage Treatment Systems**  
*Minimum Requirements for Site Suitability, Design,  
Construction, Operation and Maintenance*

**Preface**

This minimum requirement document was developed by the Livingston County Department of Public Health (LCDPH). The minimum requirements contained in this document have been developed for countywide application of alternative methods of sewage treatment. This is a working document and modifications may be made as deemed necessary by the LCDPH.

**MINIMUM REQUIREMENTS FOR  
ALTERNATIVE ON-SITE SEWAGE TREATMENT SYSTEMS**

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**I. ALTERNATIVE ON-SITE SEWAGE TREATMENT SYSTEMS**

**A. General Information**

1. Plans prepared by a Michigan registered engineer, registered sanitarian, or a professional approved by the Livingston County Department of Public Health (LCDPH) are required for alternative treatment systems. In addition to the following details, the plan shall include a legal description of the property, a benchmark established on the property and a general site plan including buildings and their uses.
2. Alternative treatment systems are generally recommended for sites that do not meet the minimum criteria set forth for conventional systems by the Livingston County Sanitary Code. **However, alternative treatment systems are NOT viable options for every site. Some sites unfortunately may be unsuitable for the construction of a home.**
3. The type of alternative treatment system must be first approved by the LCDPH. Please refer to the six (6) criteria established by the Livingston County Sanitary Code Board of Appeals, dated October 15, 2003 (Appendix A), last updated June 27, 2007.
4. Alternative treatment systems are required to have a continuous maintenance agreement with a qualified firm for the life of the system. A copy of the agreement will be provided to the LCDPH. The alternative treatment system deed restriction and permit agreement (Appendices C & D) shall be recorded with the Livingston County Register of Deeds and a copy of the recorded documents submitted to the LCDPH.

**B. General Definitions**

**Alternative Treatment System:** A treatment and dispersal system which is not a conventional system and provides for an equivalent or better degree of protection for public health and the environment than a conventional system.

**Approved:** A written statement of acceptability issued by the local health officer or the department.

**Basal Area:** The effective in situ soil surface area available to transmit the treated effluent from the sand fill media into the original receiving soils.

**Conventional System:** An on-site sewage treatment system consisting of treatment only with a septic tank or tanks and a subsurface soil absorption system with distribution of the effluent to subsurface soil trenches or an absorption bed.

**Cover Material:** The material used to cover absorption trenches or bed systems, usually selected on its availability, cost, and ability to support vegetation and transfer oxygen.

**Distribution Cell Area:** The area within the soil absorption trenches or bed where the effluent is distributed into the soil below. This area is normally considered the interface between the stone (or stone-less distribution product) and the native soil or fill below.

**Final Treatment System:** System constructed of trenches or an absorption bed located after the alternative treatment device which disperses the treated effluent to the soil.

**Effluent:** Liquid discharged from a septic tank or other on-site sewage system component.

**Excessively Permeable Soils:** Soil that contains a high percentage of coarse to very coarse sands (2.0 mm and larger) and often including fine gravels and/or cobbles. Water passes through the soil very rapidly (i.e., soil permeability < 3 min/in), and internal free water is very rare.

**Geo-textile Fabric:** Non-woven geotextile fabric. Less than 2 oz/yd<sup>2</sup>, 10# minimum tear and 8# minimum puncture.

**Green Belt Area:** The area measured horizontally down slope from the edge of the final treatment system which is maintained undisturbed prior to, during, and after construction so as not to impede lateral movement of effluent.

**High Groundwater Elevation:** The uppermost part of the soil or underlying material that may be saturated with water for a significant length of time during wet periods of the year. The term includes perched and apparent conditions that are seasonally saturated for a time period in excess of two weeks or permanently saturated.

**Hydraulic Loading Rate:** The volume of effluent that can be applied per unit time per unit area of infiltrative surface, e.g., gallons per day per square foot (gpd/ft<sup>2</sup>). The hydraulic loading rate varies based upon soil texture, structure and effluent strength.

**Hydrostatic Test (Static Water Test):** A performance test conducted on-site to determine that the septic tank and pump chamber are watertight.

**Influent:** Wastewater flowing into an on-site sewage system component.

**In Situ Soil:** Soil present in the undisturbed natural or original position.

**Limiting Layer:** High groundwater elevation, soils with an expected permeability above 200 minutes/inch, or bedrock.

**Maintenance Provider:** An entity certified by the manufacturer or distributor to test, evaluate, and maintain proprietary alternative treatment systems. This term may also be used

to describe those individuals or companies that are approved by the LCDPH to service non-proprietary treatment systems.

**Off-site Remote Monitoring:** A web-based monitoring system that allows for detecting, diagnosing, recording and reporting fault conditions with the alternative treatment system. It will remotely monitor maintenance activities and provide immediate alarm conditions via telemetry device that communicates with a database through an existing telephone line or wireless connection. The database information will be accessible for viewing at any time by the LCDPH on a secure website.

**Operating Permit:** A permit issued by the LCDPH for the purposes of assuring proper operation and maintenance of the alternative treatment system.

**Original Grade:** The natural land elevation which exists prior to construction.

**Permeable Soil:** Soils with a textural classification, according to the U.S. Department of Agriculture Soil Conservation Service classification system, of silt loams and some silty clay loams that are well structured with expected permeability less than or equal to 200 minutes/inch.

**Permeability:** The ability of soil to transmit liquids through pore spaces in a specified direction, e.g., horizontally or vertically.

**Pressure Distribution:** A system of small diameter pipes uniformly distributing effluent throughout a trench, bed or chamber.

**Pump Chamber:** A watertight tank or compartment following the septic tank or other pretreatment process which contains a pump, floats and volume for storage of effluent.

**Reserve Area:** An area of land with site conditions deemed suitable for the installation of a replacement system upon failure of the initial system.

**Sand Fill:** Sand texture is defined as a soil sample containing between 90% and 100% of sand size particles. Particle size for medium to coarse sand ranges between 0.25mm and 1.0mm. There should be <1% clay sized particles and a maximum of 10% silt sized particles. Percentages of these constituents in the soil sample are calculated through a sieve analysis.

**Sanitary Sewage:** Water and contaminants discharged from sanitary conveniences, including bathroom, kitchen, and household laundry fixtures of dwellings, office buildings, industrial plants, commercial buildings, and institutions. Commercial laundry wastes and industrial and commercial processes are not considered sanitary sewage.

**Septic Tank:** A pretreatment receptacle intended to be watertight that receives the discharge of sanitary sewage from a building sewer or sewers, and which is designed and constructed to separate settleable and floating solids from the liquid, store and digest organic matter prior to discharge of the liquid to the final treatment system.

**Soil Mottling** (also known as redoximorphic features): Spots or blotches of contrasting colors, such as, but not limited to, gray or brown or gray and brown colors in close proximity, that are formed in the soil matrix by the processes of reduction, translocation, and oxidation of iron and manganese compounds in soils that have been periodically saturated.

**Slowly Permeable Soil:** Soils with a textural classification, according to the U.S. Department of Agriculture Soil Conservation Service classification system, of silt loams, and some silty clay loams that are well structured with expected permeability above 200 minutes/inch.

**Soil Compaction:** An increase in the soil bulk density and a decrease in soil porosity, by the application of mechanical forces to the soil which results in a soil that is less permeable. Soils with high clay content are more easily compacted than sandy soils.

**Timer-Controlled System:** A pressure distribution system where the pump run events (time on and off) are controlled by a programmable timer and can be adjusted as desired.

**Uniform Distribution:** A method of distribution which results in equal distribution of the effluent throughout the distribution network. This will help assure a vertical unsaturated flow regime.

**Vacuum Test:** A performance test conducted on-site to determine that the septic tank and pump chamber are watertight.

**Vertical Separation:** The total depth of unsaturated soil that exists between the infiltrative surface of a distribution cell and a limiting layer.

## **II. SITE CRITERIA**

### **A. Parcel Size**

1. Isolation distance from the final treatment system area to lakes, streams, or rivers shall be a minimum of 100 feet (ft.).
2. No part of an alternative system may be installed within a 100-year flood plain. No part of an alternative system may be installed within 5 ft. to any easement (utility, road right of way, etc.).
3. Area for at least one replacement final treatment system must be available on new construction unless otherwise approved. The initial and replacement area must include a greenbelt area down gradient of the active system (50 ft.) and equal the length of the active system. The greenbelt area must be included within the parcel; it cannot encroach onto neighboring properties. The

greenbelt area must be located in a continuous undisturbed area and must be kept in vegetation without being disturbed, compacted or constructed upon.

**B. Topography**

1. The chosen area for the final treatment system having less than 3%–4% slope shall utilize a mound design utilizing the loading rates from Appendix F.
2. Slopes greater than 30% will not be considered for alternative system design construction.

**C. Minimum Soil Conditions**

1. Estimated permeability rate of not less than 200 minutes per inch shall be required in the upper 18 inches of naturally occurring soil.
2. Groundwater table shall be determined by soil mottling. There shall be a minimum of 18 inches of non-mottled natural soils in the upper soil horizons of the proposed final treatment system area. There shall be 6 inches or more of soil without mottling below the “A” horizon (topsoil).
3. **Filling to create the required isolation distance from the seasonal high water table is NOT acceptable.** Site suitability is based on the naturally occurring soil structure and profile.
4. No evidence of past filling activities or soil compaction by way of vehicular travel or any other means shall exist.

*Note: Refer to Appendix B for Isolation Distance Requirements for Alternative On-Site Treatment Systems*

**III. COMPONENTS FOR THE ALTERNATIVE TREATMENT SYSTEM**

**A. Septic Tank before Pre-Treatment**

1. A minimum 1,500 gallon two-compartment septic tank(s) or equivalent shall be required for homes with less than 5 bedrooms.
2. All tanks shall be watertight with precautions taken for anti-buoyancy. Both septic tank and pump chambers shall be tested and certified to be watertight.

Testing and certification must be performed on-site, by the tank manufacturer or design engineer, and the septic tank and pump chambers must be in place. Hydrostatic test or vacuum test may be utilized to determine if septic tanks and pump chambers are watertight; refer to Appendix G.

3. An effluent filter shall be required on the outlet of the last compartment of the last septic tank with the handle extended to within 12 inches of the top of the riser.
4. Watertight, securable risers to grade are required for all openings in septic tank. The minimum riser size shall be determined by the manufacturer.
5. Septic tanks, dosing chambers and/or alternative treatment devices shall not be placed within natural swales or other areas of natural water movement.
6. The septic tank, pump chamber and/or alternative treatment device shall be placed on a stable, level surface. A minimum of 4 inches of sand or granular bed overlaying a firm and uniform base is required. Backfill in uniform layers less than 24 inches thick. Backfill material should be free of any large stones (greater than 3 inches) or other debris. Sites with silty soils, high water table or other poor bearing characteristics must have specifically designed bedding and bearing surfaces to prevent settling.

**B. Dosing Chamber (when needed)**

1. Schedule 40 Polyvinyl Chloride (PVC) pipe shall be used between the tank(s) and the dosing chamber.
2. A separate watertight dosing chamber (minimum capacity of 500 gallons) shall be installed and shall be tested to be watertight. Testing shall be performed on-site, and the dosing chamber shall be in place; refer to Appendix G. Watertight, securable risers to grade are required for all openings in pump chamber. The minimum size of the riser shall be determined by the manufacturer.
3. Pump size and make shall be determined by the design consultant and included on the plans submitted to the LCDPH.
  - a). All electrical components and connections must be inspected in accordance with state or local codes.
4. Timers/control panels appropriate to the design of the system shall be installed. Timers/control panels are used to assure proper functioning of the mechanics of the system. A low level off control shall also be installed. Alarms shall be on a separate circuit from the pump. Control panel must be capable of providing off-site remote monitoring (see definition) 24 hours a

day, 7 days a week by the manufacturer/distributor and the certified maintenance provider as warranted by the type of treatment unit used.

5. A quick union disconnect shall be installed in the riser of the dosing chamber to remove the pump if necessary. This shall be located within 12 inches of the top of the riser.
6. Consideration for a weep hole may be necessary depending on the distance between the dosing chamber and the final treatment distribution system. If a weep hole is not installed, the discharge pipe should be installed below the frost line with a check valve in the discharge line.

#### **IV. DESIGN CRITERIA FOR ALTERNATIVE SYSTEM**

##### **A. Alternative System Sizing**

1. Daily Wastewater Flow - Design Estimates
  - a). Residential: For design purposes an allowance of 150 gpd/bedroom is required. This figure provides an adequate factor of safety necessary to promote satisfactory long term function of the alternative treatment system.

##### **B. Alternative Treatment System Construction**

1. Installation Standards
  - a). Install in accordance with manufacturer's specifications.
  - b). Take into account cold climate conditions, and provide insulation measures to prevent freezing.
2. Sub-Grade Preparation/Construction
  - a). The alternative treatment device shall be placed on a minimum 4 inches of sand or granular material to stabilize and level unit (See #6 under Septic Tank before Pre-treatment).

##### **C. Final Covering**

1. No portion of the alternative treatment device shall be covered by soil or any other structure unless approved by the Health Officer. This is to ensure proper maintenance of unit.

2. The final grade adjacent to the alternative treatment device shall slope to promote positive drainage away from the alternative treatment device. The area shall be graded to shed surface water around the alternative treatment device and prevent ponding.

**D. Plan Submittal Checklist**

1. All plans submitted to the LCDPH must include at a minimum the items found in the plan submittal checklist (Appendix E).

**V. FINAL TREATMENT- ALTERNATIVE TREATMENT SYSTEM EFFLUENT**

**A. Loading Rates**

1. The traditional method of sizing a soil-based dispersal system area is based on appropriate hydraulic loading rates for site-specific soil characteristics, as shown in Appendix F. The system design must allow for soil hydraulic loading rates as shown in Appendix F. The soil hydraulic loading rates shall be determined by the USDA soil texture and structure of the infiltrative surface or the most limiting soil texture as described in Appendix F.
2. The soil hydraulic rates in Appendix F are not the only factors that must be considered in determining the acceptability of a design and layout of a soil-based dispersal system. Additional factors that must be considered in evaluating groundwater mounding potential include ground slope, available soil infiltrative depth above restrictive layers, and established high groundwater elevation. In general, the potential for groundwater mounding will increase with the volume and rate discharged.

**B. Designated Final Treatment Area**

1. Once a designated final treatment area has been identified, barriers to prevent equipment traffic over the absorption and greenbelt areas shall be provided to prevent damage to the upper soils during pre-construction. Before issuance of a permit, it must be demonstrated that the final treatment area (both active and reserve) has been properly protected from disturbance. **Absorption areas that are damaged prior to installation will void the On-site Sewage Disposal permit issued by the LCDPH.**
2. A greenbelt area extending 50 ft. down gradient of this system and under the ownership of the applicant must be available. The greenbelt area must be

located in a continuous undisturbed area and must be kept in vegetation without being disturbed, compacted or constructed upon.

**C. Final Treatment Construction**

1. Trench construction is recommended and preferred over drainbed construction.
2. A minimum of 24 inches shall be required from the seasonal high water table or limiting soil texture to the bottom of stone.
3. Seasonal high water table shall be determined by soil mottling.
4. If utilizing a drainbed for final treatment, the system shall be pressurized to achieve equal distribution.
5. Prior to covering trenches or drainbed, a 2 inch minimum layer of straw or approved light-weight geo-textile fabric shall cover the top of the stone.

**D. Observation Ports**

1. An observation port or ports shall be appropriately placed to evaluate the performance and condition of final treatment (Appendix H).

**E. Finish Grade of Final Treatment Area**

1. Finish grade shall place approximately 6–12 inches of permeable soil over the system. The berm slopes shall maintain a minimum of 4 to 1 slope.
2. A grass cover over the final treatment area is necessary as soon as possible. If system is constructed after September 15<sup>th</sup>, a vegetative cover must be provided. Cover may consist of sod, mulch, straw or other suitable material to stabilize area and prevent freezing.

**F. Moratorium**

1. A moratorium on alternative treatment system installations will exist between November 1 and April 15 without express written approval from the LCDPH and the design consultant.
2. Installation of the alternative treatment system sewage disposal system is limited to certain dry times of the year as approved by the LCDPH and design

consultant. The issuance of a sewage disposal permit does not guarantee the septic system can be installed to correlate with occupying the dwelling.

**G. Contractor Responsibility**

1. It shall be the contractor's (installer's) responsibility to obtain all necessary inspections from both the design consultant and the LCDPH as construction proceeds. Refer to the approved engineer plans and the LCDPH permit.
2. The contractor shall be licensed and bonded with the LCDPH, and for a proprietary treatment system, be a certified installer by the manufacturer of alternative system prior to construction.

**H. Design Consultant Certification**

1. The design consultant shall provide the LCDPH with written certification that the installed wastewater treatment system was constructed in accordance with the approved design.

**I. General Completed Site Considerations**

1. Any field tile shall be kept at a distance away from the system of 20 ft. up gradient and 50 ft. down gradient.
2. Consideration shall be taken in the design project for an appropriate area to discharge non-sewage wastewater (eaves trough, water softener, sump pump, etc.). Non-sewage wastewater shall not discharge into or near septic tanks, alternative treatment systems or final treatment system.
3. No sprinkler systems shall operate in the septic or greenbelt areas.
4. Seeding of final treatment area must be done without compaction of soils.

**VI. MAINTENANCE INSTRUCTIONS, SERVICE CONTRACT AND ALTERNATIVE TREATMENT SYSTEM DEED ADDENDUM**

**A. Maintenance Instructions**

1. The design consultant shall provide the homeowner with written instructions (owner's manual) for the operation and maintenance of the proposed sewage treatment system.

2. Off-site remote monitoring (see definition) may be required for the alternative treatment system 24 hours a day, 7 days a week for the lifetime of the system, depending on the type of alternative system installed.

**B. Service Contract**

1. Prior to final approval of the permit to install a wastewater system, the homeowner is required to enter into a minimum one (1) year maintenance contract with a certified maintenance provider (*certified by manufacturer or distributor*) to test, evaluate, and provide required maintenance on the alternative wastewater treatment system on an annual basis.
2. The contract must provide for a minimum of an annual inspection of septic tank and monitoring of sludge level to determine when pumping is necessary, cleaning of the effluent filter, inspection of pump chamber, amperage draw reading on pump during operation, flushing of the distribution network, and inspection and evaluation of the alternative treatment system.
3. The consultant or maintenance provider shall submit a report to the Homeowner, Distributor and/or Manufacturer and the LCDPH of their findings of the annual inspection and maintenance visit(s).
4. A copy of the one (1) year maintenance contract shall be provided to the LCDPH prior to final approval of the permit to install the wastewater system. The contract shall have the signatures of the homeowner and the maintenance provider, and a copy of the receipt of the final contract shall be required.
5. The maintenance contract shall be renewed after the one (1) year period with the existing maintenance provider, or a new contract shall be started with another qualified maintenance provider, along with an Operation Permit from the LCDPH. A maintenance contract is required for the life of the system and is necessary to assure the proper operation and maintenance of the on-site wastewater treatment system. A copy of the renewed or new contract shall be submitted to the LCDPH when the operating permit is renewed.
6. If the maintenance provider of record is terminated by either party, the maintenance provider shall notify the LCDPH within 10 days of such termination. The homeowner shall then provide the LCDPH within 30 days of such termination a copy of a contract with another certified maintenance provider that will maintain the treatment system.

**C. Alternative Treatment System Deed Addendum**

1. An alternative treatment system permit agreement must be filed with the Livingston County Register of Deeds, with a copy provided to the LCDPH, before a permit to install the wastewater system will be issued. (*Refer to Appendix C*).
2. Prior to completion of the septic permit, an alternative treatment system deed restriction must be filed with the Livingston County Register of Deeds, with a copy provided to the LCDPH. (*Refer to Appendix D*).

**D. Required Permits**

1. A replacement permit is required for any alteration, extension or replacement to the alternative treatment system in accordance with Section 301.05 of the Livingston County Sanitary Code.

**E. Right of Entry**

1. The LCDPH reserves the right to return to the home site to review, test and/or obtain samples to monitor the overall maintenance of the system.
2. The LCDPH reserves the right to observe the maintenance program selected by the design consultant to maintain proper treatment of the waste.

**F. Disclaimer**

1. The LCDPH reserves the right to require special restrictions in addition to those listed herein to ensure that an adequate sewage treatment system is installed. These restrictions may be determined on a site specific basis.

## **APPENDIX A**

Minimum Standards for Proprietary  
Advanced Wastewater System Approval

## Minimum Standards for Proprietary Advanced Wastewater System Approval for Marginal Sites in Livingston County

- 1) The product must be tested according to the product standards and testing protocol established by the National Sanitation Foundation (NSF) in the *NSF Standard No. 40 Residential Wastewater Treatment Systems*, July 2000 or subsequent versions. The testing may be performed by the NSF or another independent approved testing facility. Other independent field studies or evaluations of working systems may also be considered in addition to minimum standard certification to determine if the product performs according to the certification standards.
- 2) At the discretion of the Livingston County Department of Public Health (LCDPH), depending on the complexity of the treatment system, the product shall have capabilities for off-site remote monitoring 24 hours a day, 7 days a week by the manufacturer, distributor and maintenance provider. Off-site Remote Monitoring is a web based monitoring system that allows for detecting, diagnosing, recording and reporting fault conditions with the alternative system. It will remotely monitor maintenance activities and provide immediate alarm conditions via telemetry device that communicates with a database through an existing phone line or wireless connection. The database information will be accessible for viewing at any time by the LCDPH on a secure website. The database shall also provide a section that lists the current maintenance provider's name, date maintenance contract began and date contract expires. If and when a contract expires the maintenance provider and manufacturer shall notify the LCDPH. **Ultimate responsibility of contract expiration or termination is that of the manufacturer.**
- 3) The **manufacturer** is responsible to submit electronically standardized Operation and Maintenance (O & M) reports for each site on an annual basis to the LCDPH. O & M reporting shall be conducted for the life of the system. Failure to submit the reports on a timely basis may result in discontinuance of product acceptance in Livingston County.
- 4) The **manufacturer** must demonstrate the following:
  - They are a viable company with proven technical expertise in the wastewater industry and capable of providing assurance of product reliability and backing in the event of poor product performance.
  - Replacement parts are readily available for mechanical components of the product.

The **manufacturer** shall be able to provide the following:

- Educational material in both written and digital format that provides the homeowner with basic knowledge of the treatment system and the importance of the **do's and don'ts**.
  - Assurance that continued consultation and service will be provided in the event that the distributor should fail to meet required oversight or in the event the distributor should go out of business.
- 5) The **manufacturer** must demonstrate the capabilities of providing adequate training and certification of distributors, installers and maintenance providers. The

manufacturer must also be conveniently available for consultation both on and off site. The manufacturer shall provide assurance plans that:

- a. Oversee that their maintenance providers are responding to alarms and any service calls in a timely manner.
  - b. Oversee/monitor the activities of their certified installers, distributors and maintenance providers to assure proper installation and maintenance are being performed.
  - c. Provide written procedures on how installers and maintenance providers are “certified” to perform said duties on the product. Manufacturer shall also have in place a policy to rescind “certification” of any installer or maintenance provider that is unable to maintain the standards set forth by the manufacturer.
  - d. Provide annual audits of the distributor(s) to assure compliance with customer services, training for both installers and maintenance providers, troubleshooting and product performance. Once the annual audit is completed the manufacturer shall provide an annual report to the LCDPH on the audits conducted within Livingston County.
- 6) The **manufacturer** will also be responsible for annual sampling on working systems randomly chosen from each service provider to confirm product is performing to the certified standards. These results can be included in the annual report to the LCDPH. In the event the product is not providing consistent results, the manufacturer shall provide an after action plan documenting the problem(s) and how it shall be corrected. Failure to provide the annual report, sampling data and any after action plans may jeopardize the LCDPH approval.
- 7) The **manufacturer/distributor** must obtain written acceptance for use by the MDEQ in accordance with Act No. 288 of the Public Acts of 1967, R560.424, “Alternative Methods of Sewage Treatment and Disposal”. The LCDPH will be responsible for requesting MDEQ approval to allow the technology for use in land divisions. MDEQ review will not be requested until all conditions under these criteria have been adequately addressed.

The LCDPH reserves the right to update and amend these requirements as deemed necessary by the Livingston County Health Officer. Failure to meet and maintain these requirements may result in product acceptance being revoked in Livingston County.

The LCDPH shall review applications for use of packed filter bed systems and or other pretreatment systems and determine if their use is in compliance with these minimum standards. The use of pretreatment systems is also contingent upon the site strictly meeting with the minimum standard for building sites as established by the LCDPH.

Livingston County Sanitary Code Board of Appeal approved March 5, 2003

Updated by Board of Appeals October 15, 2003

Updated by Livingston County Health Officer June 6, 2006 (Revisions to Minimum Standard #2)

Updated by Livingston County Health Officer January 4, 2007 (Included “electronically” to #6)

Updated by Livingston County Sanitary Code Board of Appeal June 27, 2007 consensus to expand on Manufacturer’s responsibility.

## **APPENDIX B**

### Isolation Distance Requirements for Alternative On-Site Sewage treatment Systems

**LIVINGSTON COUNTY DEPARTMENT OF PUBLIC HEALTH  
 REQUIREMENTS FOR ALTERNATIVE TREATMENT SYSTEM  
 ISOLATION DISTANCE FOR SINGLE FAMILY HOMES**

Feature [a]	To Final Treatment (feet)	To Alternative treatment unit, Septic Tank, Dosing Tank (feet)
Private Wells	50	50 [b]
Surface Waters	100	50
Drainage Swales	50	50
Water Lines	10	10
Building Foundations:		
-With footing drains:		
up-gradient of system	25	10
down gradient of system	50	10
-Without footing drains	25	10
Property Lines:		
-up-gradient of system	10	10
-down gradient of system	50	10
Storm Drains	50	25

**Notes:**

[a] The final treatment, as used in the table above, includes the greenbelt area.

[b] The force main from the dosing tank to the septic tank shall be isolated a minimum of 50 ft. from wells and surface waters.

\*For parcels less than one (1) acre in size, subdivisions or site condo developments use these setbacks as well as those found in MDEQ Administrative Rules for **“On-Site Water Supply and Sewage Disposal for Land Divisions and Subdivisions (R 560.401 to R 560.428)”**.

## **APPENDIX C**

### **Permit Agreement for Alternative On-Site Treatment Systems**

STATE OF MICHIGAN
LIVINGSTON COUNTY DEPARTMENT OF PUBLIC HEALTH

PERMIT AGREEMENT
Alternative On-Site Sewage Treatment System

In the matter of: Property located at
Livingston County, Michigan

Property Owner(s):
Husband and wife
Married man/married woman
Single man/single woman

Property Owner(s) Mailing Address:

This Agreement, made and entered into this \_\_\_ day of \_\_\_, 20\_\_\_, by and between the Livingston County Department of Public Health, 2300 E. Grand River Ave., Howell, Michigan (hereinafter referred to as the "LCDPH" or "Health Department") and the above-named Property Owner(s) (hereinafter referred to as the "Property Owners"), who own the Property located at \_\_\_, Section \_\_\_, \_\_\_ Township, Livingston County, Michigan (hereinafter referred to as "Property"), hereby stipulate and agree as follows:

- 1. The legal description of the Property located at \_\_\_, Section \_\_\_, \_\_\_ Township, Livingston County, Michigan is as follows:

Livingston County, Michigan

Tax ID# \_\_\_\_\_

- 2. The Health Department shall issue a permit to allow the Property Owners to install an alternative on-site sewage treatment system on the Property under the conditions set forth below in accordance with the LCDPH's Sanitary Code and the Manufacturer's installation criteria. Failure of the Property Owners to comply with these conditions may result in immediate vacation of the Property, no re-occupancy without approval of the LCDPH, and commencement of legal proceedings (Sec 303, Livingston County Sanitary Code).
3. The Property Owners shall record a Deed Restriction with the Livingston County Register of Deeds and provide proof of recordation to the LCDPH.
4. The Property Owners shall have installed on the Property and alternative on-site sewage treatment system by a certified installer as determined by the Manufacturer and LCDPH.
5. The Property Owners further acknowledge that the on-site treatment system is an alternative/unconventional system. Due to the mechanical nature of the alternative systems, failure to properly operate and maintain the system greatly increases the likelihood of failure, therefore potentially creating a public health nuisance. The Property Owners assume the risk associated with the operation of the alternative on-site treatment system.
6. Once the system is approved, the Property Owners agree to contractually provide lifetime operation and maintenance ("OM contract") of this treatment system by a qualified (as determined by the Manufacturer of the alternative on-site sewage treatment system and LCDPH) maintenance provider.

7. The Property Owners shall be responsible to renew an "operating permit" from LCDPH on an annual basis, and pay the associated fee. As part of the "operating permit" process, the Property Owners shall be required to document to LCDPH that an OM contract has been executed for the current annual period.
8. If the Property Owners fail to renew their "operating permit," LCDPH shall provide the necessary inspections of the system by a qualified OM provider and charge the Property Owners for this service plus an additional fee for non-compliance.
9. If the Property Owners do not renew the "operating permit" for a period of two consecutive years, the on-site sewage treatment system shall be considered in non-compliance, for which the Property Owners shall be guilty of a misdemeanor and subject to civil penalties of up to \$1,000 for each violation or day that the violation continues (Sec. 303, Livingston County Sanitary Code).
10. Term: This Agreement shall be permanent and run with the land and shall be assigned to future owners of the Property unless the Property is connected to a public sanitary sewer.

IN WITNESS WHEREOF, the authorized representatives of the parties hereto have fully executed this instrument on the day and year first above written.

**PROPERTY OWNERS:**

_____	By: _____	_____
Date	(print name)	Signature
_____	By: _____	_____
Date	(print name)	Signature

SUBSCRIBED AND SWORN to before me, a Notary Public, this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by:  
\_\_\_\_\_

\_\_\_\_\_, Notary Public  
 State of Michigan, County of \_\_\_\_\_  
 Acting in the County of \_\_\_\_\_  
 My Commission Expires: \_\_\_\_\_

**LIVINGSTON COUNTY DEPARTMENT OF PUBLIC HEALTH**

By: \_\_\_\_\_  
 Area Sanitarian (print name) Signature  
 Date: \_\_\_\_\_

SUBSCRIBED AND SWORN to before me, a Notary Public, this \_\_\_\_ day of \_\_\_\_\_, 20 \_\_, by:  
\_\_\_\_\_

\_\_\_\_\_, Notary Public  
 State of Michigan, County of \_\_\_\_\_  
 Acting in the County of \_\_\_\_\_  
 My Commission Expires \_\_\_\_\_

**After recording, please return to:**  
 Livingston County Department of Public Health  
 Environmental Health Division  
 2300 E. Grand River, Suite 102  
 Howell, MI 48843

Drafted by:

Timothy M. Perrone  
Cohl, Stoker, Toskey & McGlinchey, P.C.  
601 N. Capitol Avenue  
Lansing, MI 48933  
(517) 372-9000

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**APPENDIX D**

Deed Restriction for Alternative  
On-Site Sewage Treatment System

## DEED RESTRICTION

\_\_\_\_\_, (husband and wife; married man/married woman; single man/single woman) (herein after referred to as "Property Owners") and currently residing at \_\_\_\_\_, own property commonly known as \_\_\_\_\_ Township, Livingston County, Michigan, (hereinafter referred to as the "Property") and legally described as:

\_\_\_\_\_  
\_\_\_\_\_  
Tax ID#: \_\_\_\_\_  
\_\_\_\_\_ Township, Livingston County, Michigan.

The Property Owners have entered into an alternative on-site sewage treatment system **PERMIT AGREEMENT** (copy attached as Exhibit A and incorporated by reference) with the Livingston County Department of Public Health, 2300 E. Grand River Ave., Howell, Michigan (hereinafter referred to as "LCDPH" or "Health Department"), in order to install an alternative on-site sewage treatment system on the property.

Purpose: The purpose of this Deed Restriction is to ensure that the alternative on-site sewage treatment system on the Property is properly operated and maintained by the current and future Property Owners so as to not create a public health concern or nuisance due to failure of the treatment system; to meet the minimum sewage system requirements suitable for an on-site sewage system; and to provide notice to future owners that such restrictions run with the land in order to prevent a public health concern or nuisance on the Property.

### Description of Restrictions:

1. The Property Owners shall record this Deed Restriction with the Livingston County Register of Deeds and provide proof of recordation to the LCDPH.
2. The Property Owners shall have installed an alternative on-site sewage treatment system in conformance with the LCDPH's Sanitary Code and the manufacturer's installation requirements.
3. The Property Owners agree to contractually provide lifetime operation and maintenance ("OM contract") of this treatment system by a qualified (as determined by LCDPH and the Manufacturer and/or Distributor of the alternative on-site sewage treatment system) maintenance provider.
4. The Property Owners shall be responsible to obtain/renew an "operating permit" from the Health Department on an annual basis. The Property Owners shall be assessed a fee for the operating permit as determined by LCDPH. The fee will cover costs associated with tracking and monitoring compliance. As part of the "operating permit" process, the Property Owners shall be required to document to the Health Department that an OM contract is in place. The OM contract shall specify that the Manufacturer and/or Distributor shall be responsible for reporting to LCDPH. If during the year the Property Owners secure an OM contract with a different qualified provider, a copy of that agreement must be provided to LCDPH within 30 days of signing the agreement.
5. The Manufacturer and/or Distributor shall be responsible to provide the LCDPH with documentation completed by the OM provider regarding inspections conducted during the permit year. OM providers shall complete inspection forms as provided by LCDPH.
6. If the Property Owners fail to renew their "operating permit," the LCDPH shall provide the necessary inspections of the system from a qualified OM provider, and charge the Property Owners for this service plus an additional fee for non-compliance. As provided by LCDPH Sanitary Code (Sec 100.03), the Property Owners shall provide access to the property for the physical inspection of the alternative on-site sewage treatment system, to ensure that a condition that jeopardizes public health does not exist.

7. If the Property Owners do not renew the "operating permit" for a period of two consecutive years, the sewage treatment system shall be considered in non-compliance for which the Property Owners shall be guilty of a misdemeanor and subject to civil penalties of up to \$1,000 for each violation or day that the violation continues (Sec 303, Livingston County Sanitary Code).
8. The Property Owners shall be required to connect to a public sanitary sewer system when it is available, as defined by Public Act 368 of 1978, as amended.
9. Term: This Deed Restriction is permanent and shall run with the land, and is fully applicable and enforceable upon all future owners of the Property unless the Property is connected to a public sanitary sewer.

IN WITNESS WHEREOF this instrument shall take effect upon full execution by the authorized representatives of the parties.

**PROPERTY OWNERS:**

\_\_\_\_\_ By: \_\_\_\_\_  
 Date (print name) Signature

\_\_\_\_\_ By: \_\_\_\_\_  
 Date (print name) Signature

SUBSCRIBED AND SWORN before me, a Notary Public, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
 by: \_\_\_\_\_

\_\_\_\_\_, Notary Public  
 \_\_\_\_\_  
 State of Michigan, County of \_\_\_\_\_  
 Acting in the County of \_\_\_\_\_  
 My Commission Expires:

**LIVINGSTON COUNTY DEPARTMENT OF PUBLIC HEALTH**

\_\_\_\_\_ By: \_\_\_\_\_  
 Date Area Sanitarian (print name) Signature

SUBSCRIBED AND SWORN to before me, a Notary Public, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
 by: \_\_\_\_\_

\_\_\_\_\_, Notary Public  
 \_\_\_\_\_  
 State of Michigan, County of \_\_\_\_\_  
 Acting in the County of \_\_\_\_\_  
 My Commission Expires:

After recording, please return to:  
 Livingston County Department of Public Health  
 Environmental Health Division  
 2300 E. Grand River, Suite 102  
 Howell, MI 48843

Drafted by:

Timothy M. Perrone  
Cohl, Stoker, Toskey & McGlinchey, P.C.  
601 N. Capitol Avenue  
Lansing, MI 48933  
(517) 372-9000

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## APPENDIX E

### PLAN SUBMITTAL CHECKLIST

In order to install a system correctly, it is important to develop overall plans that will clearly communicate how to install the system correctly. The following checklist may be used when preparing plans for review. The checklist is suggested as a general guide. Not all needed information may be included in this list. Additional information may be needed or requested to address unusual or unique characteristics of a particular project.

#### Forms and Fees

- Application form for submittal, provided by reviewing agency along with proper fees.

#### Soils Information

- Complete soil description for each soil boring described by a competent professional.
- The location of all borings and backhoe excavations must be identified on the plot plan.

#### Documentation

- Plans signed, sealed, and dated by licensed professional.
- Copy of design worksheet confirming basis of design and design calculations.
- Copy of the Operation & Maintenance (Owner's) Manual.

#### Plot Plan

- Dimensioned plans or plans drawn to scale (scale indicated on plans) with property boundaries clearly marked.
- Slope directions and percent in initial and replacement system area.
- Bench mark and north arrow.
- Setbacks and isolation distances indicated as per appropriate code.
- Two-foot contours or other appropriate contour interval within the system area.
- Location information; legal description of parcel must be noted.
- Location of any nearby existing system or well.

#### Plan View

- Dimensions for distribution cell(s).
- Location of observation pipes.
- Overall dimensions of mound.
- Pipe lateral layout, which must include the number of laterals, pipe material, diameter, length and number, location and size of orifices and orifice shields.
- Manifold and force main locations, with materials, length and diameter of each.

### Cross Section of System

- Include tilling requirement, distribution cell details, percent slope, side slope, and cover material.
- Lateral elevation, position of observation pipes, dimensions of distribution cell, and type of cover material and geotextile fabric.
- Sand fill specifications.

### Tank and Pump Information

- All construction details including cross section of tanks.
- Size and manufacturer information for prefabricated tanks.
- Notation of pump model, pump performance curve, and summary of calculation for total dynamic head.
- Notation of high water alarm manufacturer and model number.
- Cross section of dose tank / chamber to include storage volumes; connections for piping, vents, and power, pump “off” setting , pump control timer settings and volume, high water alarm setting, location of vent and riser details.
- Tank leak testing requirements.

### Detailed specifications

- Detailed specifications for all materials and equipment.
- Detailed specifications describing all phases of site preparation and construction including provisions for protection of mound areas prior to construction and testing.

### Inspections

- Inspection shall be made in accordance with requirements of the local health department. The inspection of the system installation and/or plans is to verify that the system at least conforms to specifications listed. Minimum inspections may include, but are not limited to:
  - Preconstruction Meeting (to verify proper site preparation)
  - Preparation Active Field
  - Verify Acceptable Sand Fill
  - Final/Pressure Test
  - Final Grade
  - Engineer Certification
- Affidavit signed by designer attesting to compliance with approved plans and specifications (to be submitted after final construction of wastewater system). Any modifications to the system from the original plans approved must be detailed to LCDPH.

Designer signature: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX F

### Soil Loading Rates for Infiltrative Surfaces

SOIL TEXTURE	SOIL STRUCTURE		HYDRAULIC LOADING RATE (gpd/ft <sup>2</sup> )
	SHAPE	GRADE	BOD<30 mg/L
Coarse sand, Sand, Loamy coarse sand, Loamy sand	Single grain	Structureless	1.6
Fine sand, Very fine sand, Loamy fine sand, Loamy very fine sand	Single grain	Structureless	1.0
Coarse sandy loam, Sandy loam	Massive	Structureless	0.6
	Platy	Weak	0.5
		Moderate, Strong	
	Prismatic , Blocky, Granular	Weak	0.7
Moderate, Strong		1.0	
Fine sandy loam, Very fine sandy loam	Massive	Structureless	0.5
	Platy	Weak, Moderate, Strong	
	Prismatic , Blocky, Granular	Weak	0.6
		Moderate, Strong	0.8
Loam	Massive	Structureless	0.5
	Platy	Weak, Moderate, Strong	
	Prismatic , Blocky, Granular	Weak	0.6
		Moderate, Strong	0.8
Silt Loam	Massive	Structureless	0.2
	Platy	Weak, Moderate, Strong	
	Prismatic , Blocky, Granular	Weak	0.6
		Moderate, Strong	0.8
Sandy clay loam, Clay loam, Silty clay loam	Massive	Structureless	
	Platy	Weak, Moderate, Strong	
	Prismatic , Blocky, Granular	Weak	0.3
		Moderate, Strong	0.6
Sandy clay, Clay, Silty clay	Massive	Structureless	
	Platy	Weak, Moderate, Strong	
	Prismatic , Blocky, Granular	Weak	
		Moderate, Strong	0.3

Source: Adapted from Tyler, 2000 – USEPA Onsite Wastewater Treatment Systems Manual

\* For BOD<sub>5</sub> > 140 mg/l, see Chapter 5

## APPENDIX G

### Watertight Testing of Installed Pre-cast Concrete Tanks

Because of the serious problems that may result from infiltration or leakage, no single field test for tanks is more important than the watertightness test. The objective of this test is to assess the entire tank for watertightness, including the concrete structure itself, tank section seams, pipe penetrations and riser connection seams, after it has been installed and all connections have been made.

Either of two tests may be used: 1). Static Water Test; or, 2). Vacuum Test. Under most circumstances, either test should adequately assess the watertightness of a tank. Vacuum testing is generally preferred because it requires a shorter test time, applied forces are equally distributed throughout the inside of the tank (during the static water test, the force on the inside of the tank increases with depth), and it affords an easier, more precise measurement of test results. The major disadvantage of vacuum testing is the somewhat specialized equipment required and the difficulty in sealing off tank access openings.

Regardless of the test employed, a thorough inspection of tank construction and installation are crucial and can often identify potential watertightness problems prior to watertightness testing.

#### **Recommended Procedure for the Static Water Test:**

1. Temporarily seal inlet and outlet pipes.
2. Fill tank with clean water to the ceiling of the tank, or 2 inches above the top of the tank inside the riser if so equipped. Allow the tank to sit undisturbed for 24 hours.
3. If there is visible leakage (water flowing or dripping in a steady stream), repair the tank, refill it and allow it to stand for one hour. No visible leakage is allowed.
4. If water is dripping or flowing in a steady stream, repair the tank and retest.
5. Condensation on the exterior of the tank due to temperature variation is not considered a failure.

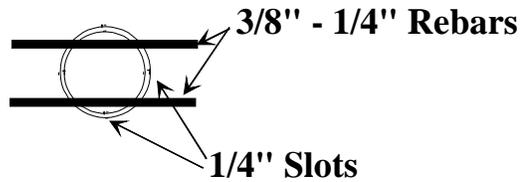
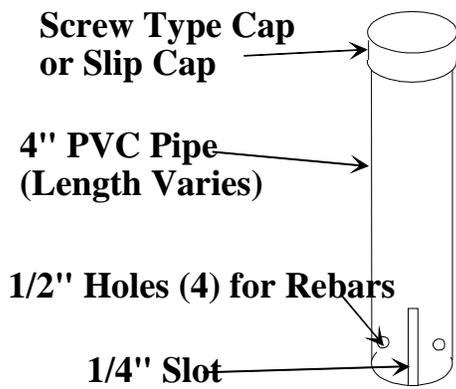
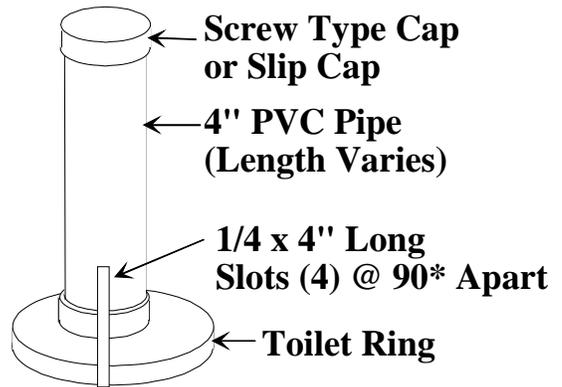
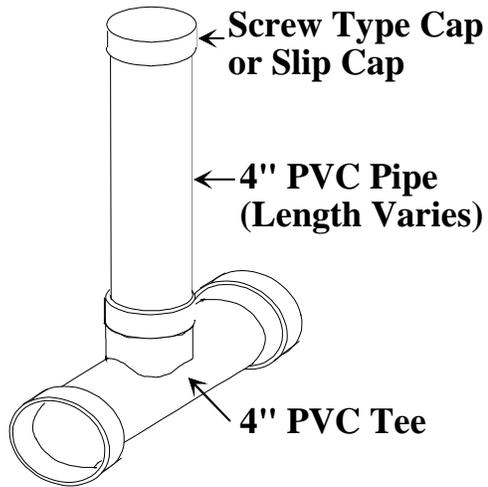
#### **Recommended Procedure for the Vacuum Test (Refer to the table below):**

1. Temporarily seal inlet and outlet pipes and access openings.
2. Using proper equipment, draw a vacuum to a minimum of 4 inches of mercury.
3. Hold vacuum for five minutes. Depending on the tank configuration, it may take some time to stabilize the vacuum level due to various factors (compression of sealant, temperature variations, etc.) It is permissible to apply vacuum until the vacuum level stabilizes at 4 inches.
4. Once vacuum is stabilized, remove the vacuum source and hold the vacuum for 5 minutes. If the tank fails the test, it may be repaired and retested. The suggested range of the gauge is 0 – 10 inches of mercury (maximum).

**WARNING:** Testing with negative pressure involves potentially hazardous conditions. It is recommended that the negative air pressure testing of concrete tanks not exceed 7 inches of mercury, which is the recognized maximum requirement for structural strength proof testing. Take precautions to minimize potential risks by incorporating safety devices that will prevent excessive vacuum levels (safety release valves, etc.)

## APPENDIX H

### Observation Port Example Details



**END VIEW (BOTTOM)**