

**Commonwealth of Pennsylvania**  
**Department of Environmental Protection (DEP)**  
**Bureau of Water Standards and Facility Regulation**  
**Harrisburg, PA**

**Issued to:** Geomatrix, LLC  
114 Mill Rock Road East  
Old Saybrook, CT 06475  
Phone: 860-510-0730  
[www.soilair.com](http://www.soilair.com)

**Technology:** SoilAir Systems

**Classification Type:** Alternate technology

**Classification Date:** January 4, 2010

In accordance with Title 25, Chapter 73, Section 73.72, DEP has classified the SoilAir system for use as an alternate onlot sewage treatment system. This classification permits the use of the SoilAir as a treatment system within the Commonwealth of Pennsylvania for the specific purpose of restoring the absorption area performance by stimulating soil microorganisms through air injection.

#### I. Technology Description

The SoilAir system is a process by which an installed air blower moves air into the system absorption area and adjacent soil, in order to reestablish aerobic conditions and rejuvenate the absorption area. The process is used to enhance treatment efficiency and to improve hydraulic capacity, by displacing carbon dioxide, methane and hydrogen sulfide, and increasing oxygen levels in the absorption area. The process can enhance wastewater treatment by increasing the aerobic microbial population and helping to reverse diminished soil permeability caused by the effects of anaerobic bacterial metabolism. In this way, the use of the SoilAir technology may help correct a system that is determined to be failing or ponding due to an excessive anaerobic biomat accumulation condition. This technology is generally employed in repair situations, but may be used as a component in new installations. In either case, it is considered to be a permanent part of the system, and a local agency permit is required for installation.

#### II. Design Requirements

- a. Evaluation Procedure: In repair situations, in order to determine if addition of a SoilAir system may benefit a specific site, a complete evaluation of the existing system history and current condition must be completed by the site evaluator. The following information should be developed and made part of the permit for the site:
  - (1) The evaluator should complete the SoilAir Evaluation Form, available from SoilAir. This includes an assessment of the history of the property, water usage, the condition of existing sewage system components and their locations, and the soil conditions present in the location of the existing absorption area. SoilAir (and/or their designee) will provide technical assistance with the site evaluation protocol.

- (2) The completed SoilAir Evaluation Form and any accompanying documents are submitted to SoilAir for review, to determine the appropriateness of the technology for the specific location. If Soil Air determines from the information submitted that the technology may be effective in rehabilitating the existing absorption area, SoilAir will provide a letter stating this. This letter may include additional items to be incorporated into the design plan.
  - (3) A design is then prepared by the site evaluator/designer and submitted to SoilAir for review. SoilAir will evaluate the design for adequacy. If the design is deemed adequate, SoilAir will provide a letter to the site evaluator/designer stating this, as well as any operation and maintenance requirements that may be specific to the design proposed.
  - (4) The site evaluator/designer submits copies of all design and supplemental information, to the local agency SEO and to the Regional and Central Offices of DEP. The submission should include the following:
    - i. Design of the SoilAir system for the specific location;
    - ii. Copies of the SoilAir review letters;
    - iii. A plot plan of the project, showing the locations of all lot features, including the existing system, any soil test pit locations, all isolation distances, contours, etc.;
    - iv. Completed *Site Investigation and Percolation Test Report for Onlot Disposal of Sewage* (Document #3800-FM-WSFR0290A) forms for any soil evaluation pits performed, signed by the SEO;
    - v. A copy of the completed SoilAir Evaluation Form, including any attachments;
    - vi. The original permitting documentation for the existing system, if available.
- b. Construction:
- (1) A representative of SoilAir must be present at the time of both installation and start-up of the system.
  - (2) The property owner's contractor will install the technology under the supervision of a representative of SoilAir.
  - (3) Within 30 days of the installation, a representative of SoilAir shall meet with the homeowner and SEO to review the operation of the system and operation and maintenance requirements.
  - (4) Whenever possible, it is recommended that the SoilAir assembly be installed within the existing septic tank. The advantages of this installation method include facilitating accurately monitoring the tank level, ease of service, no need for additional man ways or valve boxes, and less intrusive installation.
  - (5) The technology is installed in a similar manner to installing an effluent filter. The septic tank baffle is removed and is replaced with the SoilAir unit assembly. Tank baffles integral to the septic tank must not be removed or altered, as this will compromise the structural integrity of the tank. If an effluent filter is used, a filter with an integral level switch, such as a Zabel or PolyLock filter, is preferred. When a riser pipe is required, the riser is drilled so that the airline and level switch wire are run through it. It should not be necessary to modify the septic tank or compromise its structural integrity in any manner.
  - (6) The following procedure is used to install the technology:

- i. Pump tank(s) and dewater leach field, if full or ponded;
- ii. Install SoilAir components;
- iii. Seal D-box and other potential air leaks;
- iv. Place additional top soil/cover over absorption area where significant differences in cover thickness are present;
- v. Start blower. If any gross air leaks are detected, seal any leaks;
- vi. Put smoke indicator into smoke canister;
- vii. Mark locations where smoke indicates leaks, and seal with caulk, grout, soil and/or bentonite;
- viii. Program blower for desired operation;
- ix. Check system operation in a few days, and then again in a few weeks; smoke test again, if necessary.

### III. Minimum Maintenance Standards

- a. Provision of the permit requirements for operation and maintenance to the permittee.
- b. Operation and maintenance in accordance with permit requirements.

### IV. Permitting Requirements

- a. An SEO who has successfully completed an appropriate Department sponsored training course that included this specific technology, or has received review delegation in writing from the Department, may independently review the design and issue the permit for systems including components designed under this listing. All other system proposals under this listing must be submitted to the Department for review and comment.
- b. An SEO may issue a permit for installation of this technology only after receiving comments from DEP for the information submitted in Section II.a.(4).

### V. Planning Requirements

Not applicable