

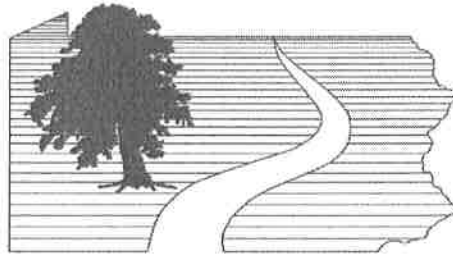
APPENDIX B

ON-LOT SEWAGE SYSTEM SURVEY OF THE TAYLORSVILLE AREA

**On-Lot Sewage
System Survey**
of the
Taylorsville Area

*Situate in
Upper Makefield Township, Bucks Co., PA*

Prepared by



**Penn's Trail
Environmental, LLC**

21 E. Lincoln Ave. - Suite 160

Hatfield, PA 19440

Phone: (215) 362-4610

Fax: (215) 362-4620

www.pennstrail.com

May 31, 2013

PTE#1356

Introduction

Penn's Trail Environmental, LLC was contracted by Upper Makefield Township to conduct a survey of existing individual sewage disposal systems in the immediate vicinity of Taylorsville Road, Washington Crossing Road and General Washington Memorial Boulevard (PA Route 532). The survey area had been identified by the Bucks County Department of Health (BCDH) as an area with malfunctioning on-lot disposal systems (OLDS) due to a variety of factors, including: the buildings' constructions predating the PA Sewage Facilities Act, relatively small lot sizes to meet standard isolation distances and variable soil conditions.

Detailed Scope of Services

This sewage system survey was contracted to be completed as a review of properties within the targeted community for indications of malfunction of the respective sewage disposal systems. The survey assessed potential surface malfunctions or groundwater contamination, both conditions presenting a public health concern. The survey included a review of BCDH files for component details of the sewage system serving each parcel or documented system problems and an inspection of each participating property for visible or olfactory indications of system malfunction by a PA-certified Sewage Enforcement Officer with more than 35 years of experience. Visible indicators of system malfunction would include effluent on the ground surface, areas of erosion, soggy areas, and/or areas of distressed or lush vegetation. Olfactory indicators would include identifiable sulfidic sewage odors.

A raw water sample was also collected from each participating property to assess whether the groundwater aquifer had been impacted by sewage systems contributing to groundwater recharge prior to proper treatment of the effluent.

User Reliance

Penn's Trail Environmental, LLC has completed the sewage needs survey according to the terms of our contract with our client and acknowledges that Upper Makefield Township may rely on the findings provided in this report in conjunction with a pending update its Official Act 537 Sewage Facilities Plan as required by the PA Department of Environmental Protection and subject to the extent of our Professional Liability/Errors and Omissions insurance coverage (E&O).

The texts, materials, and results presented are considered proprietary and confidential information that may not be used in whole or in part without authorization of the contracted parties.

Location of Survey Area

The sewage system survey was designed to include the area of Taylorsville Road, Washington Crossing Road and General Washington Memorial Boulevard (PA Route 532). A total of 36 parcels were targeted to have been included in the survey. The municipality had sent three certified-mail notices to each of the property owners requesting participation in the survey. Twenty-one property owners authorized site inspections to be conducted for indications of sewage system failure and water samples to be collected and analyzed for coliform bacteria and nitrate-nitrogen (N) as indicators of sewage contamination of the groundwater aquifer. Fourteen owners failed to respond to the notices; one property owner declined to participate in both the inspection and water sample. One property owner, located just beyond the targeted survey area, requested to be included in the survey. Bucks County Department of Health (BCDH) records were identified for six (6) of the 21 participating properties. It should be noted that the information available from the BCDH files was of limited use because of incomplete records or the poor reproduction quality as a result of the media system (microfiche) that is used by the agency.

The following parcels authorized the survey to be conducted:

- Tax Parcel# 47-15-63;
- Tax Parcel# 47-15-64;
- Tax Parcel# 47-20-9;
- Tax Parcel# 47-20-10;
- Tax Parcel# 47-20-10-2;
- Tax Parcel# 47-21-4;
- Tax Parcel# 47-21-6;
- Tax Parcel# 47-21-10;
- Tax Parcel# 47-21-12;
- Tax Parcel# 47-21-19;
- Tax Parcel# 47-21-21;
- Tax Parcel# 47-21-24;
- Tax Parcel# 47-21-25;
- Tax Parcel# 47-21-26;
- Tax Parcel# 47-22-1;
- Tax Parcel# 47-22-2;
- Tax Parcel# 47-22-3;
- Tax Parcel# 47-22-4;
- Tax Parcel# 47-22-94;
- Tax Parcel# 47-22-95;
- Tax Parcel# 47-22-96.

The owner of Tax Parcel# 47-21-3 responded to the municipal letter but did not wish to participate in the survey. The owner-signed document that was received by the municipality in response to the request is included in this report.

Survey of Participating Properties

Staff of Penn's Trail Environmental, LLC visited the participating properties on Wednesday, April 17, 2013, Thursday, April 18, 2013 and Friday, April 19, 2013. The property owners had been either contacted by telephone or a voice-message left on answering machines on Monday, April 15, 2013 in order to provide sufficient notice as requested.

In general, the survey consisted of a physical inspection of the individual parcel for visible indications of sewage system malfunction. In cases where the locations of the systems were not known, attention was paid to visible surface indicators such as circular or elongated depressions or mounded areas of soil as indications of system components. The perimeter of each property was inspected for overflow pipes or unauthorized discharges. A survey form was completed for each property and photographs were taken. These are attached to this report.

A raw drinking water sample was collected from each property. At those properties having some form of treatment (chlorination, particulate filter, carbon filtration or ultra-violet disinfection), the sample was collected from a hose bib pre-treatment. Pre-treatment sample collection was not possible at one participating property, Tax Parcel# 47-22-1. On each property, the plumbing outlet was wiped of loose deposits, flame-treated with a butane torch and the water allowed to run to waste for between five and ten minutes, depending on location and accessibility to drainage. The water samples were collected in laboratory-supplied bottlenecks, immediately labeled, stored cold on ice and delivered under chain of custody to Analytical Laboratories, Inc., a PA-certified laboratory. Each sample was analyzed for the DW1 suite of analyses which includes coliform and non-coliform bacteria, residual chlorine, Nitrate, pH, Hardness (as CaCO₃), Iron and Manganese.

The following information was developed with respect to the participating properties and is supported by the appendix for each parcel which includes: the Bucks County Health Department record, owner authorization, completed survey form, raw water analysis and property photographs:

Tax Parcel# 47-15-63

The property at 1128 Taylorsville Road was visited on April 18, 2013. The residence was tenant-occupied at the time of the inspection. The well was reported by the owner to be untreated. A water sample was collected at 11:55 from the kitchen faucet. The rear (east) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted.

Tax Parcel# 47-15-64

The property at 1130 Taylorsville Road was visited on April 17, 2013. The residence was unoccupied at the time of the inspection. A hand-dug well was observed near the southwest parcel corner. The feature was noted to be open to the atmosphere and therefore unprotected from contamination. A water sample was not collected

from the feature. The rear (east) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction, including overflow piping to the stream that roughly bisects the property. None were noted.

Tax Parcel# 47-20-9

The property at 1107 Taylorsville Road was visited on April 19, 2013. The office building was occupied at the time of the inspection. The well was treated by a carbon filter and ultra-violet (UV) disinfection unit located in the building basement. A raw water sample was collected from a hose bib prior to treatment at 14:50. The northeast area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted.

Tax Parcel# 47-20-10

The property at 1105 Taylorsville Road was visited on April 19, 2013. The office building was occupied at the time of the inspection. The well was reported by the owner to be untreated and a water sample was collected from a hose bib along the rear wall of the building at 14:25. The southeast area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. Access to the treatment tank lies beneath a steel manhole cover in the driveway/parking area. No indications of system malfunction were noted.

Tax Parcel# 47-20-10-2

The property at 1099 Washington Crossing Road was visited on April 18, 2013. The property includes a gasoline service station that was reported to have been supported by a holding tank since its construction in 1959. Sewage is removed regularly on a monthly basis, according to the owner. The well is reported not to be treated and a water sample was collected from the sink faucet in the building office area at 11:20. The area of the property north of the building was inspected for visible indications of the existing holding tank. A feature was identified as a manhole access to the holding tank in the parking area. No indications of system malfunctioning to the surface were noted. The nature of the holding tank system requires perennial maintenance.

Tax Parcel# 47-21-4

The property at 1108 Taylorsville Road that supports Colonial Farms Gourmet Food and Market was visited on April 17, 2013. The food facility was operating at the time of the inspection. The well water supply is treated by a chlorinator located in the kitchen area of the building as a condition of BCDH licensing as a food establishment. A raw water sample was collected from a hose bib prior to treatment at 12:05. The southeast area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted. Treatment tanks are accessible to the surface and the elevated sand mound absorption area is clearly visible. Sewage generated on

site is reported to be removed by pumping on a regular basis, using the treatment tanks as a holding tank system. The elevated sand mound absorption area of the system was reported to have been removed from service as it was malfunctioning. The BCDH record indicates that a 2,000-gallon grease interceptor was installed in October 1998 as carryover of grease from food preparation activities had resulted in failure of the pressure distribution system as early as 1988.

Tax Parcel# 47-21-6

The property at 1113 General Washington Memorial Boulevard was visited on April 17, 2013. The office building was occupied at the time of the inspection. The well water supply was treated by a carbon filter located in the building basement. A raw water sample was collected from a hose bib pre-treatment at 13:00. The rear (north) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted.

Tax Parcel# 47-21-10

The property at 1098 Washington Crossing Road was visited on April 19, 2013. The office building was occupied at the time of the inspection. The well water supply was treated by a particulate filter located in the building utility room. A raw water sample was collected from a hose bib pre-treatment at 13:20. The elevated sand mound absorption area located west of the building was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted. The BCDH record indicates that the permit for installation of the elevated sand mound was issued August 26, 1986 to serve a non-residential facility. A permit was issued by the BCDH February 14, 2008 to replace the clogged absorption area and distribution system.

Tax Parcel# 47-21-12

The property at 1094 Little Road was visited on April 18, 2013. The residence was occupied at the time of the inspection. The well water supply was equipped with an UV unit located on the ground floor of the building. A raw water sample was collected from a hose bib along the rear (east) foundation wall prior to UV treatment at 14:15. The locations of the treatment tank and separate grey water system for the washing machine were provided by the owner. The north area of the property was inspected for visible indications of the sewage disposal systems or indication of system malfunction. None were noted.

Tax Parcel# 47-21-19

The property at 1077 Taylorsville Road was visited on April 17, 2013. The residence was occupied at the time of the inspection. The well water supply was equipped with a particulate filter located in the building basement. A raw water sample was collected at 14:50 from a hose bib prior to treatment by a particulate filter. The location of the sewage system was provided by the property owner. The east area of the property was inspected for visible indications of the sewage disposal systems or indication of system malfunction. None were noted. The BCDH record includes

a permit that was issued December 29, 1999 to install a replacement 1250-gallon septic tank.

Tax Parcel# 47-21-21

The property at 1088 Taylorsville Road was visited on April 17, 2013. The multi-residential property was occupied at the time of the inspection. The untreated raw water sample was collected from a hose bib near the pressure tank at 13:35. The location of the sewage system was provided by a tenant representative of the property owner. The east area of the property was inspected for visible indications of the sewage disposal systems or indication of system malfunction. None were noted. The BCDH record indicates that a sewage system was permitted in 1959 for an eight-foot diameter, 12-foot deep seepage pit. A second sewage system with a trench-design absorption area may have been permitted in 1968; the BCDH record is not clear.

Tax Parcel# 47-21-24

The property at 1082 Taylorsville Road was visited on April 17, 2013. The office building was partially occupied at the time of the inspection. There was no treatment on the well water supply and a water sample was collected from a restroom faucet on the ground floor at 13:55. The east area of the property was inspected for visible indications of the sewage disposal systems or indication of system malfunction. None were noted.

Tax Parcel# 47-21-25

The property at 1080 Taylorsville Road was visited on April 17, 2013. The residence was not accessed at the time of the inspection as no contact had been made with the property owner. No water sample was collected. The east area of the property was inspected for visible indications of the sewage disposal systems or indication of system malfunction. None were noted.

Tax Parcel# 47-21-26

The property at 1078 Taylorsville Road was visited on April 17, 2013. The medical office in the building was occupied at the time of the inspection. The well water supply was equipped with a particulate filter and UV unit located in the building basement. A raw water sample was collected at 14:25 from a hose bib prior to treatment. The east area of the property was inspected for visible indications of the sewage disposal systems or indication of system malfunction. None were noted.

Tax Parcel# 47-22-1

The property at 1120 Taylorsville Road was visited on April 17, 2013. The office building was occupied at the time of the inspection. The well was reported to be treated by a particulate filter located in a crawl space according to the owner who requested that the water sample be collected from a hose bib along the rear wall of the building. A water sample was collected at 10:45 from the hose bib as requested by the owner. The rear (east) area of the property was inspected for visible

indications of the existing sewage disposal system or indication of system malfunction. None were noted.

Tax Parcel# 47-22-2

The property at 1118 Taylorsville Road was visited on April 17, 2013. Gabriel's II restaurant was operating at the time of the inspection. The well water supply was treated by chlorination as required by BCDH license as a food establishment. A raw water sample was collected from a hose bib prior to treatment at 11:30. The operator of the restaurant reported that the sewage system requires pumping every 3 to 5 weeks, especially following heavy rains. The rear (east) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted. The BCDH files indicate that a permit was issued October 29, 1976 for installation of a "sand-lined bed" absorption area and a Bi-A-Robi aerobic treatment unit. No aerobic treatment unit was observed during the survey.

Tax Parcel# 47-22-3

The property at 1116 Taylorsville Road was visited on April 17, 2013. The computer repair facility was occupied at the time of the inspection. The well water supply was reported by the owner not to be treated. A water sample was collected from the restroom faucet on the first floor at 11:40. The rear (east) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted during the survey. BCDH e-mail communication indicated that "intermittent surface malfunction; present system cesspool; isolation distances limiting factor (creek)" and December 14, 2012 letter regarding no potential upgrade of the sewage system to meet a proposed use based on isolation distances.

Tax Parcel# 47-22-4

The property at 1125 General Washington Memorial Boulevard was visited on April 17, 2013. The building supports a First National Bank branch and medical offices and was occupied at the time of the inspection. The well water supply was reported by the bank representative not to be treated. A water sample was collected from the kitchen faucet in the bank portion of the building at 12:30. The rear (north) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction. None were noted.

Tax Parcel# 47-22-94

The property at 1126 General Washington Memorial Boulevard was visited on April 17, 2013. The dental office in the building was occupied at the time of the inspection. The well water supply was untreated and a raw water sample was collected from a hose near the pressure tank at 10:15. The south area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction, including an overflow pipe to the adjoining canal. None were noted.

Tax Parcel# 47-22-95

The property at 1130 General Washington Memorial Boulevard was visited on April 18, 2013. A water sample was collected at 12:40 from a hose bib pre-treatment by particulate filter and UV unit. The rear (south) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction, including overflow piping to the canal along the east site boundary. None were noted. The existing system appears to be an elevated sand mound based on its convex form.

Tax Parcel# 47-22-96

The property at 1134 General Washington Memorial Boulevard was visited on April 17, 2013. While the residence appeared to be occupied, no contact was made with the property owner to allow a water sample to be collected. The rear (south) area of the property was inspected for visible indications of the existing sewage disposal system or indication of system malfunction, including overflow piping or indication of nutrient enrichment in the canal adjoining the east property boundary. None were noted.

Findings and Conclusions

The following table represents the survey results of the participating properties:

Tax Parcel	Date Inspected	System Malfunction	Well Water Sample	Coliform Bacteria*	Nitrate Concentration (mg/L)**	BCDH Record	Sewage System Type
#47-15-63	4/18/13	No	Yes	<1	4.0	No	ING
#47-15-64	4/17/13	No	No	--	--	No	ING
#47-20-9	4/19/13	No	Yes ^{2,4}	<1	2.95	No	ING
#47-20-10	4/19/13	No	Yes ⁰	<1	2.19	No	ING
#47-20-10-2	4/18/13	No	Yes ⁰	<1	3.23	No	HT
#47-21-4	4/17/13	No	Yes ³	<1	5.14	Yes	ESM/HT
#47-21-6	4/17/13	No	Yes ⁴	<1	2.18	No	ING
#47-21-10	4/19/13	No	Yes ¹	<1	5.80	Yes	ESM
#47-21-12	4/18/13	No	Yes ²	<1	2.51	No	ING
#47-21-19	4/17/13	No	Yes ¹	<1	2.29	Yes	ING
#47-21-21	4/17/13	No	Yes ⁰	<1	4.45	Yes	ING
#47-21-24	4/17/13	No	Yes ⁰	<1	2.16	No	ING
#47-21-25	4/17/13	No	No	--	--	No	ING
#47-21-26	4/17/13	No	Yes ^{1,2}	<1	2.43	No	ING
#47-22-1	4/17/13	No	Yes ¹⁽⁵⁾	<1	4.84	No	ING
#47-22-2	4/17/13	No	Yes ³	<1	4.56	Yes	ING
#47-22-3	4/17/13	No	Yes ⁰	<1	4.39	Yes	ING
#47-22-4	4/17/13	No	Yes ⁰	<1	3.16	No	ING
#47-22-94	4/17/13	No	Yes ⁰	<1	3.64	No	ING
#47-22-95	4/18/13	No	Yes ^{1,2}	<1	6.72	No	ESM
#47-22-96	4/17/13	No	No	--	--	No	ING

⁰ no treatment

¹ particulate filter

- ² UV treatment
- ³ chlorine treatment
- ⁴ carbon filter
- ⁵ water sample collected from Tax Parcel# 47-22-1 post particulate filter at owner's request
- *- <1 = not detected by test method
- ** - Nitrate MCL is 10 mg/L
- ING – unspecified in-ground absorption area (cesspool, seepage pit, trenches or bed)
- ESM – elevated sand mound
- HT – holding tank
- ** - Nitrate MCL is 10 mg/L

The physical surveys of the participating properties did not reveal visible or odor indications of malfunctioning sewage disposal systems. Three properties, the Shell gasoline service station, Gabriel's II restaurant and Colonial Farms Gourmet Food & Market, reported regular pumping of their systems. The gasoline station was reported to be served by a holding tank requiring regular maintenance. The operators of Gabriel's II reported that their system fills following heavy rains, indicating that a surface water/grading/infiltration concern may be contributing to their problem and may be addressed by a stormwater collection and diversion system. Colonial Farms reported that their elevated sand mound absorption area has been disconnected and they are using their treatment tanks as a holding tank system. The nature of the absorption area failure should be investigated and may be resolved. The gasoline service station is the only property surveyed that is serviced by a dedicated holding tank.

None of the water samples that were collected from the participating properties demonstrated coliform bacteria or nitrate-nitrogen that would indicate subsurface sewage system malfunctioning in that the effluent had not been sufficiently treated to remove the bacteriological or nitrate contaminants.

**ATTACHMENTS TO THIS REPORT AVAILABLE FOR REVIEW
AT THE UPPER MAKEFIELD TOWNSHIP BUILDING**