

TRIP REPORT EAST LINCOLN HIGHWAY VALVE SITE – INFILTRATION TESTING

1.0 PURPOSE

This Trip Report presents the field data and results of double-ring soil infiltration tests conducted to support the design of a stormwater management system at the East Lincoln Highway Valve site located in West Whiteland Township, Chester County, Pennsylvania as part of the Pennsylvania Pipeline Project (PPP) for Sunoco Pipeline, LP. One shallow test (IT-A) was performed at the site. The test location is listed by coordinates (latitude and longitude) in Table 1 and shown on the attached figure.

2.0 FIELD ACTIVITIES

The infiltration test was conducted by Jim Goerdt and Jim Coffman of Tetra Tech, Inc., on October 7, 2016. The test location was positioned in the field using a handheld, WAAS-enabled GPS unit. Table 1 provides the coordinates of the test location. IT-A was located on a flat grassy area, approximately 800 feet south of East Lincoln Highway.

The infiltration test was performed in accordance with the procedure specified in the 2006 Pennsylvania Stormwater Best Management Practices (BMP) Manual. The test location was prepared with hand tools, and care was taken to minimize disturbance of the soil surface to be tested. Double-ring infiltrometers were used for testing and consisted of 10-inch diameter and 6-inch diameter sections of steel casing, each 10 inches in height. After digging to the target depth, the test surface was leveled, and loose soil and debris were removed. The rings were driven a minimum of 2 inches into the soil. The infiltration test depth is presented in Table 1.

The test location was pre-soaked for 1 hour. The test was then conducted with measurements at 10-minute or 30-minute intervals, based on the observed water level drops during the last half of the pre-soak period. Pre-soak and test information was recorded on an infiltration test data sheet; a copy of the test data sheet is attached to this report.

During the testing, the weather was sunny, approximately 60 degrees Fahrenheit, and no precipitation was observed during the time of testing. Additionally, less than 0.5 inches of precipitation was observed 24 hours prior to testing.

A hand auger was utilized to characterize the soil, determine the depth to bedrock, if encountered, and inspect for evidence of the seasonal high water table near the test area. This was completed from the ground surface down to two feet below the target infiltration test depth. Descriptions of the soil were documented on a field log, which was based on the form example in the BMP manual. A copy of the soil log is attached to this report.

3.0 RESULTS

3.1 Soil Description

Soils encountered generally consisted of a relatively deep (up to approximately 23 inches) brown (7.5YR 4/4) loamy sand topsoil/surface layer with rock fragments ranging up to large gravels. This topsoil/surface layer was underlain by a brown (7.5YR 4/4) sandy loam with rock fragments ranging up to large gravels. Bedrock was not encountered.

Seasonal high water was not observed at the testing location, nor was any mottling observed.

According to United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey data, the soil type for the test locations is mapped as follows:

- Urban Land - (UudB soil symbol) with 0-8 percent slopes; Web soil survey did not have data regarding runoff or drainage patterns.

3.2 Infiltration Tests Results

Table 1 summarizes the infiltration rate (inches per hour) calculated from the test data. Infiltration rates presented in Table 1 were calculated from the average water level drop of the last four stabilized readings measured in the inner ring.

The pre-soak test result indicated a high infiltration rate, requiring a 10 minute test cycle.


Table 1
Summary of Infiltration Test Results
East Lincoln Highway Valve
West Whiteland Township, Chester County, PA
Sunoco PPP

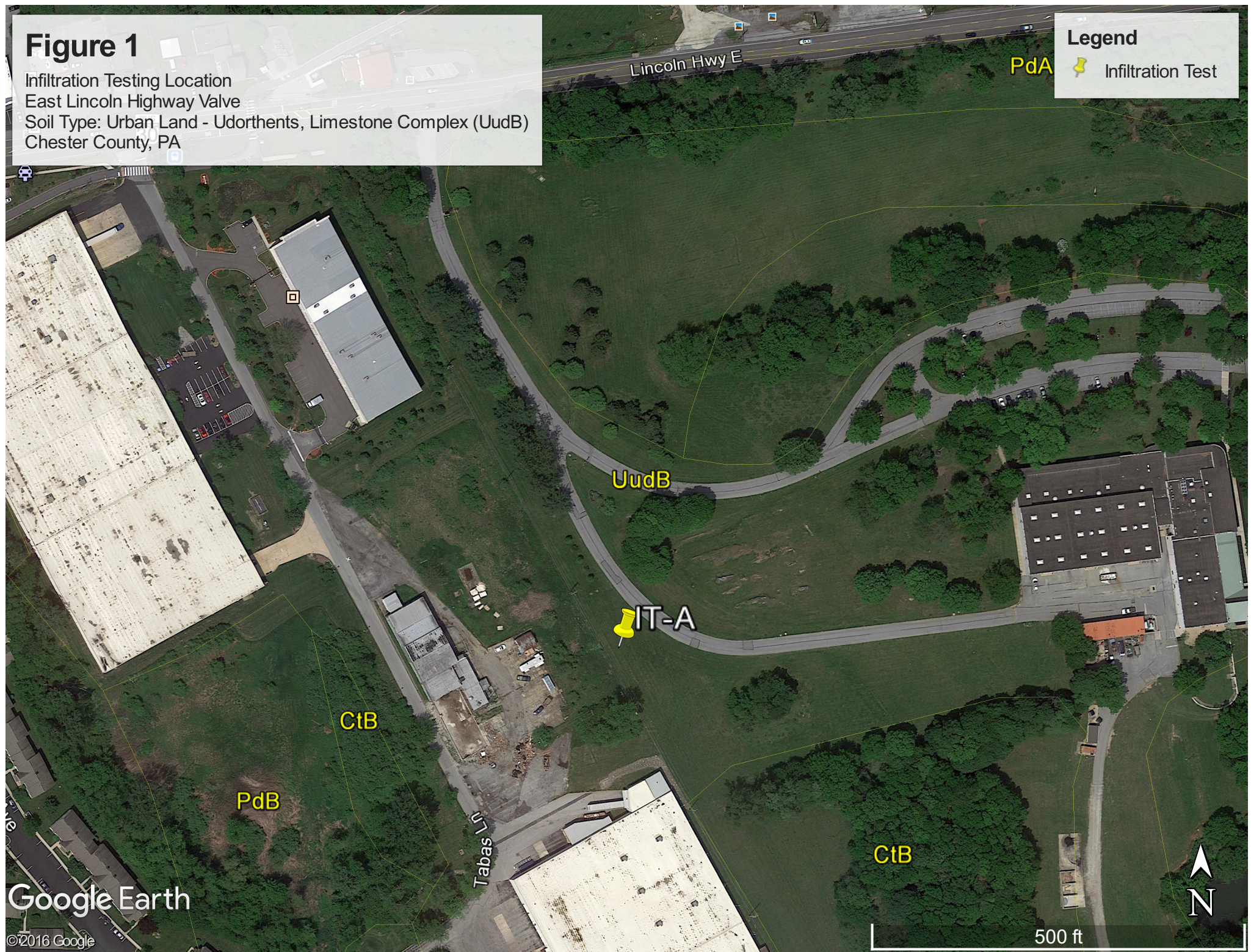
Test Location (IT-)	Location Data		Test Depth (inches)	Infiltration Test Result (inches/hour)
	LATITUDE	LONGITUDE		
IT-A	40.02707°	- 075.61652°	4	5.25

Figure 1

Infiltration Testing Location
East Lincoln Highway Valve
Soil Type: Urban Land - Udorthents, Limestone Complex (UudB)
Chester County, PA

Legend

-  Infiltration Test



ATTACHMENTS

SOIL LOGS



TETRA TECH

Soil Log

Tested By: J. Coffman

Project: Sunoco Marine E2

Project No.: 112 IC05958

Test Pit: E. Linda (Exton) A

Date: 10/7/16

Elevation: _____

Equipment Used: hand auger

Geology: Soil

Soil Type: loamy sand

Land Use: grass area (mowed)

Weather: ptly cloudy

Additional Comments

Photo #24 * ⁷GPS coordinates of A test location: (N 40.0270⁷, W 75.616⁵²) (stored in # 080) (ETX 10 unit)

Horizon	Upper Boundary	Lower Boundary	Soil Textural Class	Type, Size, Coarse Fragments, etc.	Soil Color	Color Patterns	Pores, Roots, Rock Structure	Depth to Bedrock	Depth to Water	Comments
A	0"	23"	loamy sand	little rock frag up to 1/4" gravel.	Bwn 7.5R 4/4	solid no mottling	small roots down to 2"	—	—	moist
A	23"	27"	sandy loam	"	Bwn 7.5R 4/4	solid no mottling		—	—	moist

Horizon:	USDA Definition	Soil Textural Class	Boundary	Notes:
O	Organic debris	US Department of Agriculture Soil Conservation Service	Use depth and classification	* changed LOD resulted in about a 40 ft shift to the NE for location A (to be clear of Sunoco pipelines). LOD was moved E to fence line, then toward private drive (away from Taber Ln) * see GPS data in Add. Comments above for test loc.
A	Dark colored, mixed mineral organic matter		Classification as Follows:	
B	Maximum accumulation of silicate clay minerals		Abrupt	
C	Weathered parent material		Clear	
R	Layer of consolidated rock beneath the soil		Gradual	
			Diffuse	

Table based on: Sample soil log located on page 12 of the Pennsylvania Stormwater Best Management Practices Manual
USDA Definitions located from: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054308

INFILTRATION TEST DATA SHEETS



INFILTRATION TEST DATA SHEET

Tetra Tech, Inc.

(East Lincoln Highway side)

PROJECT NAME: Sunoco PPP TEST AREA ID: IT-A Exton
 PROJECT NUMBER: 1123605958 PERSONNEL: J. Goerd

TEST METHOD: Double Ring Infiltrometer Percolation
 Single Ring Infiltrometer

Location Coordinates or Description:
 ~20 feet E. of Parcel line
 * N: 40.02707
 * W: 75.61652

INNER RING INSIDE DIAMETER/HEIGHT: 6"/10"
 OUTER RING INSIDE DIAMETER/HEIGHT: 10"/10"

PERCOLATION HOLE DIAMETER: - (If performing an open hole perc test)

DATE(s): 10/7/16 **Rainfall within last 24 hrs < 0.5"**

Distance from the bottom of the inner ring/hole to measuring point (minimum water column of 6-8 inches): 8"

MEASURING POINT: Ring Rim Indicator Mark DEPTH OF TEST: 4"

TIME	ELAPSED TIME SINCE START OF TEST (minutes)	WATER LEVEL DROP, INNER RING OR PERCOLATION HOLE (inches)	VOLUME OF WATER ADDED AT EACH CYCLE, INNER RING (liters)	REMARKS
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PRESOAK DATA

905	-	-----	42	Start Pre Soak
935	30	3 1/16"	2L	
1005	60	2 13/16"	1.6L	End Pre Soak

TEST DATA

1005	0 (60)	-----	-	Start test
1015	10 (70)	14/16"	0.50L	
1025	20 (80)	14/16"	0.50L	
1035	30 (90)	14/16"	0.50L	End test
1045	40 (100)	14/16"	-	

* Changed location of test due to original location outside limit of disturbance

* Existing Sunoco lines running parallel w/ 4' chain link fence, approximately 36" x 3' 8" off of parcel line. NE

* Final location approx 40' from original location.