

## **TRIP REPORT**

### **SINCLAIR ROAD 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 Sinclair Road Valve site located in Heidelberg Township, Lebanon County, Pennsylvania, as part of the Pennsylvania Pipeline Project (PPP) for Sunoco Pipeline, LP. One deep and one shallow test (IT-A) were performed at the site. The test locations are listed by coordinates (latitude and longitude) in Table 1 and shown on the attached figure.

#### **2.0 FIELD ACTIVITIES**

The infiltration tests were conducted by Jim Goerdts and Jim Coffman of Tetra Tech, Inc., on October 5, 2016. The test locations were positioned in the field using a handheld, WAAS-enabled GPS unit. Table 1 provides the coordinates of the test locations. Both tests were located in a relatively flat horse pasture, east of Sinclair Road.

The infiltration tests were performed in accordance with the procedure specified in the 2006 Pennsylvania Stormwater Best Management Practices (BMP) Manual. The test locations were prepared with hand tools and a mini-excavator, 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 depths are presented in Table 1.

The test locations were pre-soaked for 1 hour. The tests were then conducted with measurements at 10-minute or 30-minute intervals, based on the observed water level drop during the last half of the pre-soak period. Pre-soak and test information were recorded on infiltration test data sheets; copies of the test data sheets are 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.

Test pits were excavated near each testing location to characterize the soil, determine the depth to bedrock, if encountered, and inspect for evidence of the seasonal high water table. The test pits were identified with the corresponding infiltration test name. The test pits were machine-excavated to 2 feet below the target infiltration test depth or refusal, whichever was encountered first. Descriptions of the soil were recorded on field logs, which were based on the form example in the BMP manual. Copies of the field soil logs are attached to this report.

### **3.0 RESULTS**

#### **3.1 Soil Description**

Soils encountered generally consisted of a deep topsoil/surface layer (up to approximately 36 inches) composed of a dark yellowish brown (10YR 4/4) loamy sand with little gravel and cobble sized quartzite fragments. This topsoil/surface layer was underlain by a dark yellowish brown (10YR 4/4) sandy loam with a similar rock content as the previous layer. 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:

- Ungers Loam - (UnD soil symbol) with 15-25 percent slopes; with high runoff and is well drained.

#### **3.2 Infiltration Tests Results**

Table 1 summarizes the infiltration rates (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 results for IT-A (surface and deep) indicated high infiltration rates, requiring 10 minute test cycles.

**Table 1**  
**Summary of Infiltration Test Results**  
**Sinclair Road Valve**  
**Heidelberg Township, Lebanon County, PA**  
**Sunoco PPP**

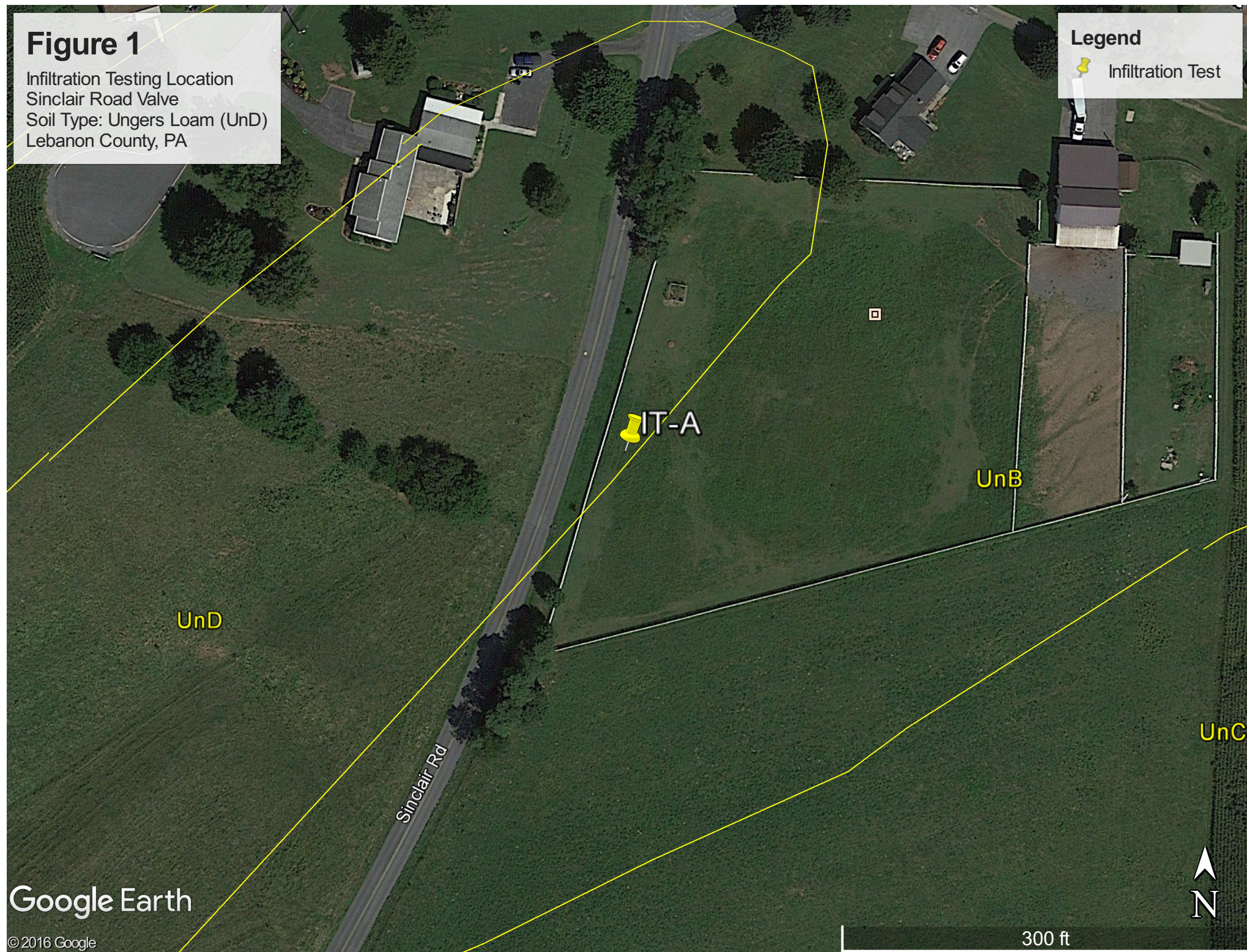
Test Location (IT-)	Location Data		Test Depth (inches)	Infiltration Test Result (inches/hour)
	LATITUDE	LONGITUDE		
IT-A (shallow)	40.2854494 °	- 076.2999613 °	4	15.19
IT-A (deep)			36	12.94



# Figure 1

Infiltration Testing Location  
Sinclair Road Valve  
Soil Type: Ungers Loam (UnD)  
Lebanon County, PA

Legend  
Infiltration Test





## **ATTACHMENTS**

## SOIL LOGS



TETRA TECH

Soil LogTested By: S. L. R. P. AProject: 112IC05958Project No.: 112IC05958Test Pit: J. CoffmanDate: 10/5/16

Elevation: \_\_\_\_\_

Equipment Used: tree holeGeology: SoilSoil Type: loamy sandLand Use: animal grazing (field)Weather: Sunny 70°

## Additional Comments

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"	36"	loamy sand	little gravel to cobble sized frag (quartz)	Burn-red 10R 4/4	solid no mottling	small roots top 2"	—	—	moist
A	36"	60"	sandy loam	"	Burn-red 10R 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	Photo #15 Photo #17 (back filled)
A	Dark colored, mixed mineral organic matter		Classification as Follows: Abrupt	
B	Maximum accumulation of silicate clay minerals		Clear	
C	Weathered parent material		Gradual	
R	Layer of consolidated rock beneath the soil		Diffuse	

## **INFILTRATION TEST DATA SHEETS**



# INFILTRATION TEST DATA SHEET

Tetra Tech, Inc.

PROJECT NAME: Sumoco PPP  
PROJECT NUMBER: 112IC05958

TEST AREA ID: IT-A Sinclair Rd  
PERSONNEL: J. Goerdt

TEST METHOD Double Ring Infiltrometer Percolation  
Single Ring Infiltrometer

Location Coordinates or Description:

INNER RING INSIDE

DIAMETER/HEIGHT:

OUTER RING INSIDE

DIAMETER/HEIGHT:

6"

10"

~35 feet off Sinclair Rd  
40.2854494  
-076.2999613

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

DATE(s): 10/5/16

Rain fall 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
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DEPTH OF TEST: 4"

[illegible]

# INFILTRATION TEST DATA SHEET

Tetra Tech, Inc.

PROJECT NAME: <u>Sunoco Marine E2</u>		TEST AREA ID: <u>Sinclair Rd (shaft tie in) A</u>		
PROJECT NUMBER: <u>112IC05958</u>		PERSONNEL: <u>J. Gelfman</u>		
TEST METHOD: <u>Double Ring Infiltrrometer</u> Percolation <u>Single Ring Infiltrrometer</u>		Location Coordinates or Description: <u>grass field (horse pasture), on</u> <u>slopeslope</u> <u>photo # 16</u>		
INNER RING INSIDE DIAMETER/HEIGHT: <u>6"</u> OUTER RING INSIDE DIAMETER/HEIGHT: <u>10"</u>				
PERCOLATION HOLE DIAMETER: _____ (If performing an open hole perc test)				
DATE(s): <u>10/5/16</u>		<u>Rainfall within last 24 hrs &lt; 0.5"</u>		
Distance from the bottom of the inner ring/hole to measuring point (minimum water column of 6-8 inches): <u>7"</u>				
MEASURING POINT: <u>Ring Rim</u> Indicator Mark		DEPTH OF TEST: <u>36"</u>		
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
PRESOAK DATA				
<u>1003</u>	<u>0</u>	<u>-----</u>	<u>2 1/4 gallons</u>	<u>start of presoak, 1016 refill</u>
<u>1033</u>	<u>30</u>	<u>7 2/16</u>	<u>4.1 L</u>	<u>1.8 L (4" level), 0928-ref, 111.7 L</u> <u>(4" level)</u>
<u>1103</u>	<u>60</u>	<u>6 0/16</u>	<u>3.4 L</u>	<u>1047-refill 111.7 L (4" level)</u> <u>End Pre-soak</u>
TEST DATA				
<u>1103</u>	<u>0</u>	<u>-----</u>	<u>—</u>	<u>starting test</u>
<u>1113</u>	<u>10</u>	<u>2 3/16</u>	<u>1.1 L</u>	
<u>1123</u>	<u>20</u>	<u>2 3/16</u>	<u>1.1 L</u>	
<u>1133</u>	<u>30</u>	<u>2 2/16</u>	<u>1.0 L</u>	
<u>1143</u>	<u>40</u>	<u>2 2/16</u>	<u>—</u>	<u>end of test</u>