

Commonwealth of Pennsylvania
Department of Environmental Protection
October 10, 2008

SUBJECT: April 2008 Surface Water Sampling Results – Bishop Tube Site

TO: File

FROM: Dustin A. Armstrong
Project Officer
Environmental Cleanup
Southeast Regional Office

The Department collected surface water samples from Little Valley Creek in the vicinity of the Bishop Tube Site on April 14, 16 and 17, 2008. This memorandum is intended to briefly summarize the results of the sampling event.

Introduction

The Bishop Tube Site is located at 1 Malin Road, in East Whiteland Township, Chester County, PA. A site location map is attached as Figure 1. The Bishop Tube site was used for the manufacture of stainless steel tubes from the mid-1950's until the late-1990's. Little Valley Creek runs north through the former Bishop Tube property, east of the manufacturing buildings. After crossing under Lancaster Avenue (Rt. 30) the stream turns eastward crossing under PA Routes 401 and 29. In this area the stream receives contributions from a number of tributaries and springs. Groundwater, which has been contaminated by the Bishop Tube site, flows generally toward the east-northeast from the source property. The lateral extent of groundwater contamination has not been fully delineated, but modeling suggests that contaminants may discharge to Little Valley Creek well downstream from the source.

Purpose

Surface water sampling and analysis was performed at the site to follow up on sampling events performed in 1994, 2003 and 2004. These earlier events had revealed elevated concentrations of the primary site contaminant at Bishop Tube, trichloroethene (TCE) and its daughter products in samples from Little Valley Creek from the site, downstream to the former Worthington Steel property east of PA Rt. 29. This sampling event was intended to follow-up these earlier sampling activities, and to assess current conditions in the same area.

Additionally, the Department is concerned about the potential for impacts to indoor air due to vapor intrusion (VI) resulting from contaminated groundwater affected by the Bishop Tube site. In addition to areas near the source of the contamination (i.e. the former Bishop Tube property), areas near groundwater discharges are also potential areas of concern with respect to the VI pathway. The Department sampled selected springs and seeps in addition to stream sampling. Descriptions of sample locations (and references to past samples) are listed in Table 1.

Methodology

All samples collected in April 2008 were analyzed by the Department's Laboratory in Harrisburg for volatile organic compounds. Stream samples collected on the former Bishop Tube property were also analyzed for chloride and fluoride. All spring/seep samples were analyzed for dissolved gases (ethane, ethene, propane, and methane), and chlorinated solvent attenuation parameters and fluoride.

Volatile organic compounds were analyzed by BOL under the VOA1 suite code. Dissolved gases were analyzed under the BOL's "METH" suite code and attenuation parameters were analyzed under the BOL's 214 Standard Analysis Code. Table 4 lists the analytical parameters included in the METH and 214 analyses. Fluoride was added to the analytical parameters requested for this sampling event, because of its historic presence as a groundwater contaminant at the site.

Analytical Results

Analytical results are summarized in Table 2, attached to this memo. A historical comparison of data from selected locations is included in Table 3. Analytical report data sheets have been placed in the regional site file (Tech Reports).

Concentrations of the primary contaminant of concern (TCE) were detected in all Little Valley Creek samples with the exception of SW-1 and SW-2 in the April 2008 sampling event. The sample collected at the Norfolk Southern Railroad bridge (SW-5) was the most contaminated sample from Little Valley Creek in April (44.2 ug/l). The data suggest that the site drainage swale entering Little Valley Creek is a major contributor to the elevated concentration of TCE detected at SW-5. A sample collected from the swale (SW-4) contained TCE at 71.3 ug/l. As in past sampling events, contaminant concentrations were significantly lower in downstream locations.

The Department collected a sample (SP-1) north of the site from a culvert discharge the south of Malin Road. The discharge is believed to originate at a spring located on the north side of Malin Road. Low levels of chlorinated solvents were detected in sample SP-1. The concentrations of VOCs detected in SP-1 do not indicate that the VI pathway is of significant concern at this spring. The source of these detections cannot be determined, based on this single sample.

Overall, comparison of data gathered in 2008 seems to indicate a downward trend in VOC concentrations within Little Valley Creek. However, due to limited data and the potential for seasonal variation, it is difficult to determine if this may be a result of flow conditions or a downward trend in regional groundwater contaminant concentrations.

List of Attachments

- Figure 1 – Site Location Map
- Figure 2 – Sample Location Map
- Figure 3 – Source Area Sample Location Map
- Table 1 – Sample Location Descriptions
- Table 2 – Surface Water Sampling Results
- Table 3 – Data Comparison – Selected Points
- Table 4 – Chlorinated Solvent Attenuation Parameters

Enclosures

cc: Mr. Buterbaugh
Mr. Sheehan
Mr. Patel
Mr. Garg
East Whiteland Township

TABLES

Table 1
 Bishop Tube / L. Valley Cr. Sampling
 April 2008
 Sample Location Information

<u>Stream/Trib Location</u>	<u>Proposed Designation</u>	<u>Former Designation</u>		<u>Rationale</u>
		<u>2003</u>	<u>2004</u>	
Amtrak Bridge	SW-1	SW-1	NS	
At SMP 3	SW-2	NS	NS	SW and Sed. sampled by Baker for FS in Oct. 2006
At SMP 1	SW-3	NS	SW-1(June)	SW and Sed. sampled by Baker for FS in Oct. 2006
Site Drainage Swale	SW-4	NS	SE-1 (June)	Assess contribution of swale discharge
Norf. Southern Bridge	SW-5	SW-3	SW-3	Immediately downstream of source property
Below Rt 30	SW-6	SW-4	NS	In-stream evaluation
Deerfield parcel mid	SW-7	SW-6	NS	In-stream evaluation
Below Rt 401	SW-8	SW-8	NS	In-stream evaluation
Above WW Spring	SW-9	SW-9	SW-6	Assess contribution of spring discharge
WW Park	SW-10	SW-10	NS	In-stream evaluation
Above Morehall Trib	SW-11	NS	NS	Upstream sample to assess influence of large tributary
Morehall Trib	SW-12	SW-14	NS	Assess influence of large tributary
Above Norwood Spring	SW-13	SW-15	NS	Upstream sample to assess contribution of spring discharge
Below Norwood Spring	SW-14	SW-16	NS	Assess contribution of spring discharge
<u>Spring/Seep Location</u>				
On-site Seep	SE-1		SE-1 (Aug.)	Also sampled by Baker for FS in Oct. 2006
Malin Hall Spring	SP-1	NS	NS	Potential intermittent contribution
People's Light Seep	SE-2	NS	SE-2 (June)	Past sample revealed suspected discharge
Norwood Spring	SP-2	SP-4A/B	NS	Known TCE discharge

Notes:

NS -Not Sampled

SMP - Stream Monitoring Point (Well)

WW - Winding Way

Table 2
Bishop Tube/L. Valley Cr.
Surface Water Sampling Results Summary
April 2008

<u>Stream/Trib Location</u>	<u>Designation</u>	t-Butyl alcohol	Tetrachloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Bromodichloromethane	1,1-Dichloroethane	MTBE	cis-1,2-Dichloroethene	1,1,1-Trichloroethane	Chloroform	Acetone	Trichloroethene	1,1-Dichloroethene	Fluoride	Chloride		
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l		
Amtrak Bridge	SW-1	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.62	nd	nd	nd	nd	43		
At SMP 3	SW-2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.37	38		
At SMP 1	SW-3	nd	nd	nd	nd	nd	nd	nd	3.2	0.63	nd	nd	14.9	nd	0.83	37.9		
Site Drainage Swale	SW-4	nd	nd	1.3	2.6	nd	1.8	1.2	99.2	33.6	Q	nd	2.4	J	71.3	2.5	1.04	33.4
Norf. Southern Bridge	SW-5	nd	nd	nd	nd	nd	nd	0.45	19.6	7.3	nd	nd	44.2	nd	1.16	37.6		
Below Rt 30	SW-6	5.1	B	nd	nd	nd	nd	nd	9.7	7.8	nd	2.5	B	38.7	nd	1.17	39.6	
Deerfield parcel mid	SW-7	nd	nd	nd	nd	nd	nd	nd	1.7	1.1	nd	nd	6	nd	NS	NS		
Below Rt 401	SW-8	3.6	B	nd	nd	nd	nd	nd	1.2	1	nd	nd	3.1	nd	NS	NS		
Between 401 & WW Park	SW-9	4	B	0.69	nd	nd	nd	0.69	0.64	0.82	nd	nd	0.96	nd	NS	NS		
WW Park	SW-10	nd	0.6	nd	nd	nd	nd	nd	0.56	1.3	nd	nd	1.2	nd	NS	NS		
Above Morehall Trib	SW-11	nd	1.8	nd	nd	nd	nd	nd	0.9	5.2	nd	2	J	5.6	0.66	NS	NS	
Morehall Trib	SW-12	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	NS	NS		
Above Norwood Spring	SW-13	nd	0.6	nd	nd	nd	nd	nd	0.49	J	1.8	nd	2.7	B	1.7	nd	NS	NS
Below Norwood Spring	SW-14	nd	0.85	nd	nd	nd	nd	nd	0.47	2.9	nd	2.5	B	2.8	nd	NS	NS	
<u>Spring/Seep Location</u>																		
On-site Seep	SE-1	nd	nd	0.49	J	14.1	nd	5.8	2.6	19.3	2.1	nd	8.7	B	1.4	0.59	5.7	46.4
Malin Hall Spring	SP-1	8.9	B	nd	nd	0.68	0.67	nd	nd	0.63	2.2	nd	nd	0.52	nd	36.9		
People's Light Seep	SE-2	nd	3.3	nd	nd	nd	4.4	nd	15	23.8	1.2	nd	17.9	1.6	0.23	185		
Norwood Spring	SP-2	nd	7.2	Q	nd	0.43	J	4.2	nd	4.2	26.6	Q	nd	26	Q	3.6	nd	118
<u>QC Samples</u>																		
Trip Blank	Trip Blank	7.2	B	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	NS	NS		
Trip Blank	Trip Blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	NS	NS		

Notes:

NS - Not Sampled

nd - Not Detected

J - Compound detected below reporting limit (est. result)

B - Compound detected in a lab blank

Q - Result is an average of multiple runs

Table 3
 Bishop Tube/L. Valley Cr
 Data Comparison - Selected Points
 April 2008

	Creek at NS Railroad Br.			Below Rt. 30 Culvert			Below Rt. 401 crossing		
year	2001	2003	2008	1994	2003	2008	1994	2003	2008
units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1,1,1-Trichloroethane	18	17	7.3	13	11	7.8	2	ND	1
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	0.64	ND	4	0.23	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	14	19.6	9	8.9	9.7	ND	0.82	1.2
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether (MTBE)	ND	6	0.45	2	4.4	ND	36	1.6	ND
Tetrachloroethene	ND	0.57	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	56	55	44.2	90	44	38.7	8	2.7	0.96
Vinyl chloride	ND	0.23	ND	ND	ND	ND	ND	ND	ND
Designation	SW-01	SW-3	SW-5	ST-4	SW-4	SW-6	ST-3	SW-8	SW-8
Reference	Baker (2002)			BWQ (1994)			BWQ (1994)		

Notes:
 ND - Not Detected

Table 3
 Bishop Tube/L. Valley Cr
 Data Comparison - Selected Points
 April 2008

year	Norwood' Spring				Creek Below 'Norwood Spring'		
	1989	1994	2003	2008	1994	2003	2008
units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
1,1,1-Trichloroethane	110	26	24	26.6	ND	2.1	2.9
1,1-Dichloroethane	3	2.2	1.6	4.2	ND	0.37	ND
1,1-Dichloroethene	12	12.4	8.2	3.6	0.9	0.27	ND
1,2-Dichloroethene (total)	9	4.9	5.5	4.2	0.6	0.39	0.47
Bromodichloromethane	ND	ND	ND	0.43	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether (MTBE)	ND	0.5	ND	ND	1	ND	ND
Tetrachloroethene	11	7.2	5.1	7.2	0.5	0.49	0.85
Trichloroethene	180	105	130	26	9.1	18	2.8
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND
Designation	SP-1	ST-7	SP-4A	SP-2	ST-8	SW-16	SW-14
Reference	NUS (1990)	BWQ (1994)			BWQ (1994)		

Notes:

ND - Not Detected

Table 4
 Bishop Tube / L. Valley Cr.
 April 2008
 Attenuation Parameters

Parameter	Ref. Method	BOL Test #	Bottle	Preservative	Holding Time	Container Lid ID	SAC	Rationale
<i>Inorganics</i>								
Sulfide	BOL/Dionex	00745	125 ml HDPE	NaOH pH>9	7 days	"S"	214	Electron donor
Alkalinity	SM 2320B	00410	500 ml HDPE *	Unpreserved	14 days	None		Aquifer conditions
Sulfate	EPA 300.0	00945			28 days	None		electron acceptor
Nitrate		00620			48 hours	None		electron acceptor
Nitrite		00615			48 hours	None		Electron donor
Chloride	00940	28 days			None	Daughter product of chlorine		
TOC	SM 5310C	00680	2 x 40ml VOA	H2SO4 pH<2	28 days	"TOC" - outer NaIq.		carbon/energy source
Iron	EPA 200.7	01045A	125 ml HDPE **	HNO3 pH<2	6 months	"M"		Electron donor
Manganese		01055A			"M"	Nutrient		
<i>Organics</i>								
Methane	RSK-175	NA	2 x 40ml VOA	Unpreserved	14 days	NA	METH	electron donor
Propane								electron donor
Ethane								degradation product of ethene
Ethene								degradation product of VC

FIGURES

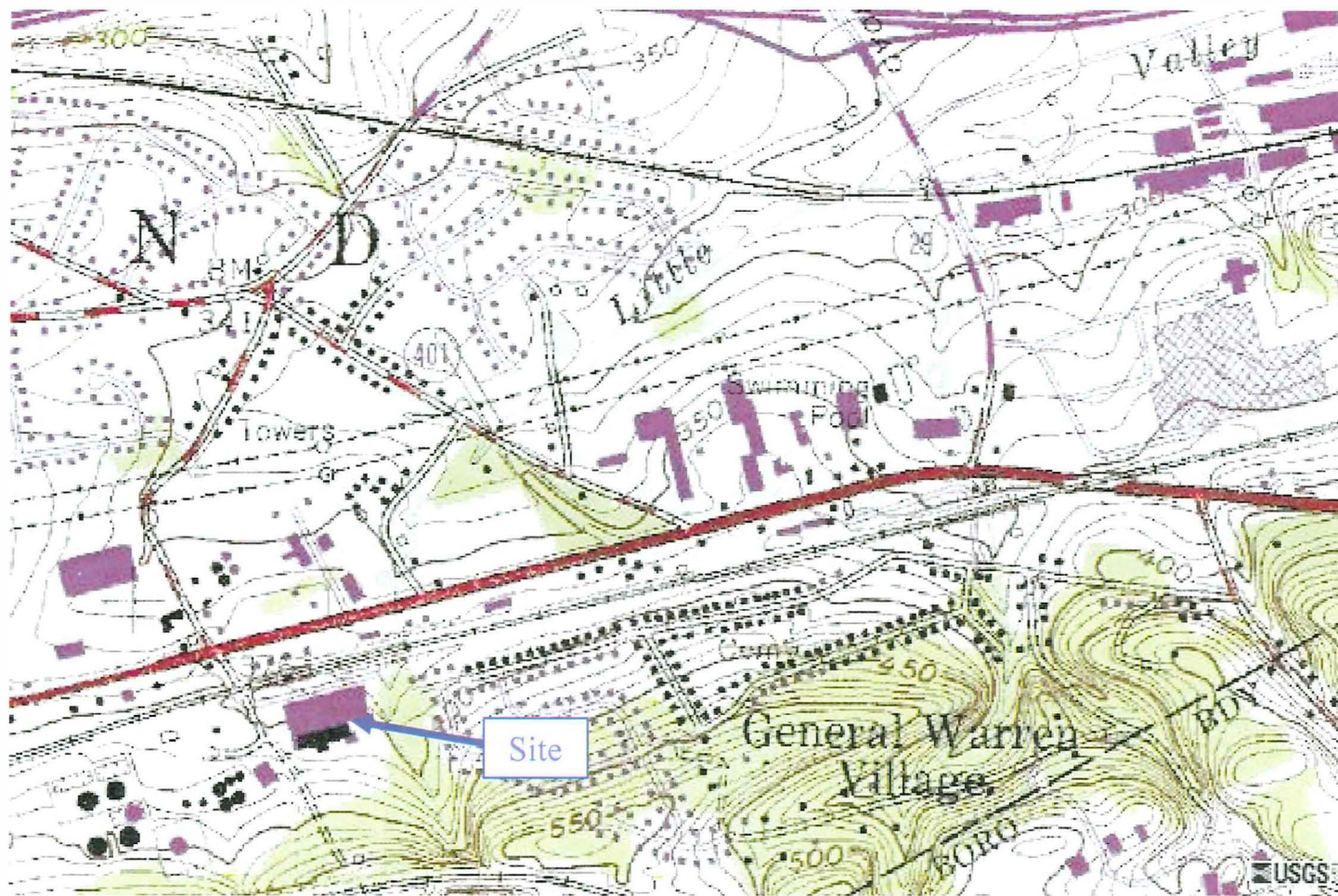


Figure 1
Bishop Tube
Site Location

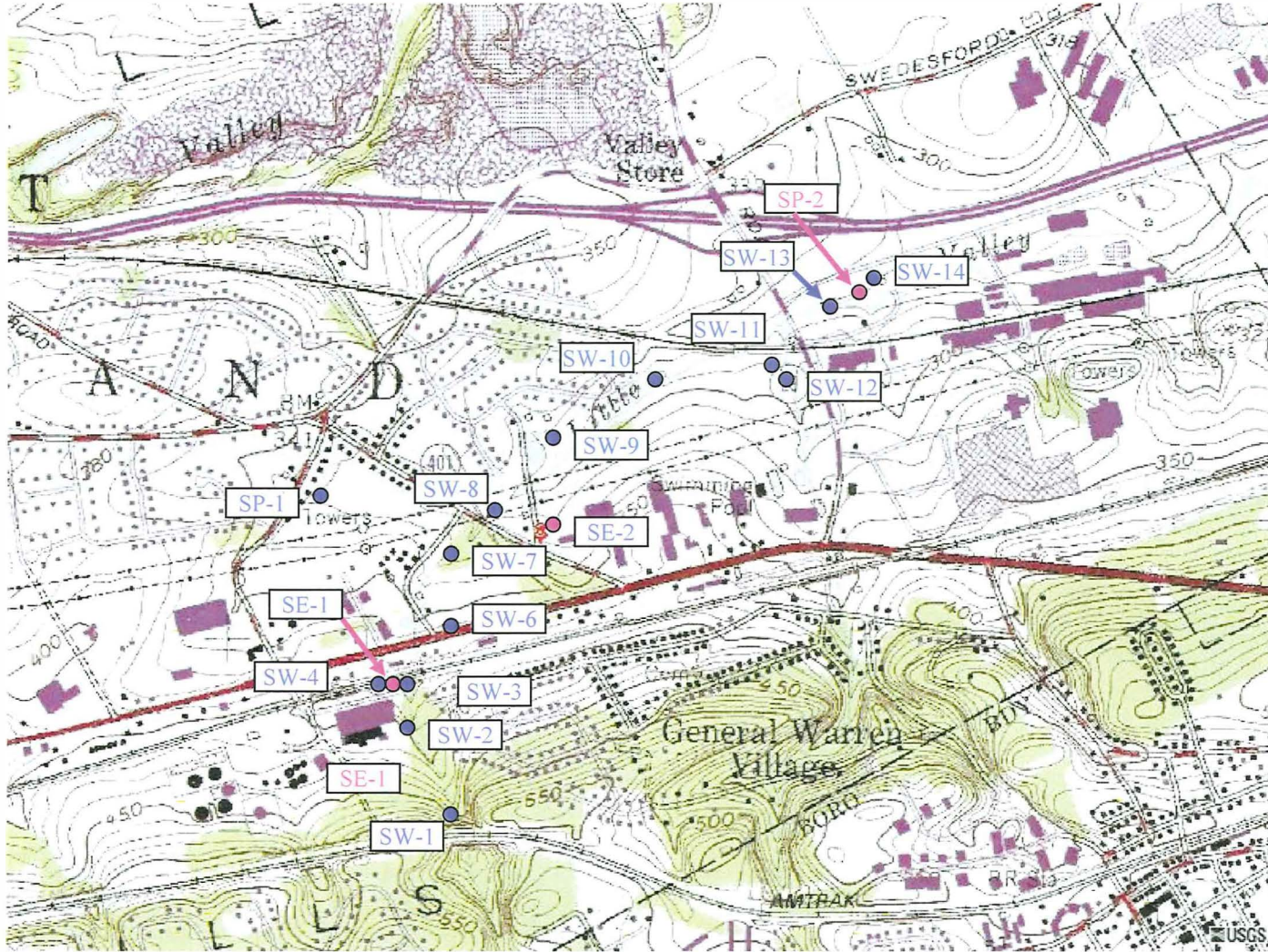


Figure 2
 Bishop Tube – Surface Water
 April 2008
 Sample Locations



Bishop Tube Site
Figure 3
Source Area Stream Samples
April 2008

