2012 PISCES Investigation Work Plan

Richardson Hill Road Landfill - Herrick Hollow Creek

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1 Introduction/Background

Herrick Hollow Creek (HHC) is a first order, headwater stream that receives surface water runoff and groundwater from the surrounding area. The Richardson Hill Road Landfill (RHRL) sits adjacent to South Pond, which is part of a larger wetland positioned at the origin of Herrick Hollow Creek. This landfill contributes both surface water and groundwater to South Pond and the HHC stream channel and was the source of contamination to the stream prior to remediation. During its operation, the landfill received primarily municipal waste, but also contained a "pit" that received waste oils containing PCBs (Barton & Loguidice, P.C., March 2009). South Pond was first excavated in 1993 following a fish kill that was attributed to contaminants seeping from the oil disposal pit. Prior to excavation, PCB concentrations in South Pond sediments were as high as 1,300 mg/kg. Remedial investigations later revealed PCBs downstream of South Pond in HHC sediments as high as 180 mg/kg, and in floodplain soils at 24 mg/kg (USEPA 2012).

Remediation of the landfill and the adjacent stream corridor began in 2003. The landfill closure was finished in 2006 and included a landfill cap, groundwater extraction trench, and a groundwater treatment plant that treats extracted groundwater before discharging to South Pond (Parsons, August 2007). Remediation of the adjacent Herrick Hollow Creek corridor involved the removal of PCB-contaminated surface sediments from South Pond, the stream channel and its associated wetlands that included a series of beaver ponds. Restoration of the stream corridor was completed in 2004, but the remnants of Hurricane Ivan in September 2004 and another storm in April 2005 damaged the newly restored stream corridor and prompted a second attempt at restoration. The final restoration of the stream corridor was completed in 2008 (Barton & Loguidice, P.C., March 2009).

PCB concentrations in fish collected from Herrick Hollow Creek remained elevated following remediation efforts at the Richardson Hill Road Landfill. All of the fish collected in 2008 had detectable levels of PCB, ranging from 0.11 to 8.2 ppm. These concentrations were similar to those from pre-remediation sampling efforts, indicated continued impact to fish and wildlife resources, and suggested that lifting of the current health advisory (NYSDOH 2012) for the consumption of fish was unlikely. The final monitoring event occurred in 2011 and fish tissue PCB concentrations ranged from 0.03 to 0.14 ppm, much lower overall than in 2008.

2 Previous Investigations

NYS DEC aquatic biologist Tim Preddice (retired) conducted a PISCES investigation of the upper West Branch Delaware River Watershed in 2005 (Preddice 2006). The study was intended to determine the cause of elevated PCB concentrations that had been detected in river otter blood plasma samples, but only small amounts of PCBs (up to 45.6 ng AR1242) accumulated in PISCES samplers placed throughout the watershed. Although PISCES samplers had not been deployed within HHC, the 2006 report concluded that the low PCB levels throughout the

watershed suggested a successful cleanup at the RHRL, but that post-remedial monitoring should be conducted within HHC and upper Trout Creek. Subsequently, post remediation monitoring conducted in 2008 revealed elevated concentrations of PCBs in fish tissues (up to 8.2 mg/kg), indicating that biota in the vicinity of RHRL were still exposed to PCBs at concentrations that are a threat to fish, wildlife, and human health. USEPA conducted an Optimization Evaluation of the RHRL and the nearby Sidney Landfill (revised draft report dated April 4, 2012). That report acknowledged the elevated levels of PCBs found in 2008 fish samples as well as the continued presence of PCBs in South Pond sediments, although all were below the 1 mg/kg sediment cleanup number. The Optimization Evaluation Report speculated that the source of PCBs to HHC was residual contamination down gradient from the groundwater collection trench and that "[i]f PCBs from upgradient of the trench are captured, the flux of PCBs to South Pond should decrease slowly over time." Based on comments from NYSDEC, the Optimization Report provided recommendations for evaluating PCB sediment contamination in South Pond, including a PISCES study. Such an evaluation, however, was contingent on the results of the 2011 fish tissue data which were unavailable at that time. The data from the 2011 monitoring event are now available and fish tissue PCB concentrations within HHC were surprisingly low (< 0.2 mg/kg).

The conflicting results described above, coupled with the elevated PCB concentrations in biota collected in 2008 and the continued presence of PCBs in sediments, have prompted the study being proposed in this work plan.

3 Goals and Objectives

DEC believes an additional round of monitoring that includes a PISCES track-down study is critical to evaluate the effectiveness of the remedy at the RHRL and the extent of any continued PCB impacts to Herrick Hollow Creek. We are proposing to utilize PISCES to determine if PCBs are present in the water column and if so, to locate the source of PCB contamination. This information is currently lacking, in part because previous rounds of monitoring have focused on routine water sampling and analysis using EPA Method 8082 which could not rule out the presence of PCBs below the detection limit of 0.05 µg/L. There are several advantages of a PCB track-down study over the routine water column sampling that has been previously conducted. Because PISCES samplers would be exposed to the water column over an extended period, PCBs dissolved in the water column will concentrate in the solvent over time, resolving issues associated with method detection limits. Also, the relative amount of PCB that accumulates within each sampler can be used to aid in the identification of a source(s).

We are also proposing another round of fish tissue sampling to determine whether elevated fish tissue concentrations in 2008 are indicative of an ongoing source. PCB concentrations in fish appeared to have declined according to data collected in 2011 by USEPA. It remains unclear whether the 2011 results are an anomaly or if the results indicate actual improvements, possibly due to residual PCBs being flushed from the system. We are also proposing sampling of surface sediments throughout Herrick Hollow Creek. Limited sediment sampling in South Pond has also indicated continued PCB impacts, but sampling beyond this area not been done since the remedy was completed.

4 Strategy and Actions

4.1 Proposed Methods:

4.1.1 PISCES Sampling:

To determine whether PCBs continue to impact Herrick Hollow Creek, and if so, to determine more definitively the source of PCBs to Herrick Hollow Creek, PISCES samplers will be deployed in and around Herrick Hollow Creek (nine locations) and also Trout Creek (two locations). Hassett-style PISCES samplers will be utilized for this study, although bag samplers will also be considered for use. PISCES sampling will be conducted in accordance with the procedures described in *Contaminant Track-down With PISCES, Standard Operating Procedures* (Preddice 2007). At each sample location, two (2) PISCES samplers will be affixed to an anchor block with polypropylene rope for a total of twenty-two (22) samplers. Prior to deployment, each sampler will be carefully prepared, filled with the appropriate amount of solvent (either Hexane or TMP depending on the sampler used). A spiking solution will then be added, and the samplers will be sealed. The PISCES samplers will then be carefully suspended in the water column and left in place for a period of fourteen (14) days. The samplers will be retrieved in accordance with the 2007 SOP protocol and will then be transported to the NYS DEC laboratory at the Hale Creek field station for analysis.

PISCES samplers will be placed in pairs at the locations depicted on Figure 1 and as described below.

Sampling Site	Location Description
PISCES #1	Groundwater Treatment Plant (GWTP) outfall
PISCES #2	Sediment Trap 1
PISCES #3	South Pond (NW quadrant)
PISCES #4	South Pond (SW quadrant)
PISCES #5	HHC logging road crossing
PISCES #6	Sediment Trap 2
PISCES #7	Beaver Pond
PISCES #8	Downstream reach (project side)
PISCES #9	Downstream reach (just beyond RHR culvert)
PISCES #10	Trout Creek upstream of confluence with HHC (at intersection of Pine Swamp Road and Teed Road)
PISCES #11	Trout Creek downstream of confluence with HHC (at Peggy Switch Road overpass)

4.1.2 Fish Tissue Sampling

To complement the PISCES study described above, fish tissue and sediments from Herrick Hollow Creek will be collected subsequent to the retrieval of the PISCES samplers. Fish will be collected using a combination of seining and electrofishing using a backpack unit. Fish sampling locations will be consistent with the six (6) locations from the two previous sampling events conducted in 2008 and 2011 by Amphenol and USEPA respectively. Two (2) additional locations will be added within Trout Creek, one above and one below its confluence with HHC.

Target species have been selected based on anticipated availability and to be consistent with those collected during previous sampling events which yielded pumpkinseed (*Lepomis gibbosus*) from South Pond, creek chub (*Semotilus atromaculatus*) from each sample location, and brook trout (*Salvelinus frontinalis*) from the two most downstream locations. An attempt will be made to obtain five (5) forage fish samples and five (5) brook trout (or pumpkinseed from South Pond) samples per location for a total of eighty (80) samples. Based on previous sampling events, the actual number of samples collected could be as low as one sample of each target species per location for a total of sixteen (16) fish tissue samples. All of the samples will be handled in accordance with NYSDEC *Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis*, October 2002. Creek chub, pumpkinseed and small (<6-inch) brook trout samples will be prepared for whole body analysis whereas larger (>6-inch) brook trout will be prepared as a standard fillet for human health assessment. Samples will be composited only when necessary to achieve the minimum required sample mass of 10 grams. If compositing is necessary, it will be done within species and by grouping similar sizes of fish within each composite. Fish samples will be transported to the NYS DEC laboratory at the Hale Creek field station for analysis.

4.1.3 Sediment Sampling

A WILDCO® Petite Ponar® Grab, 6" x 6" will be used to collect sediments from the 0-6 inch depth interval within fine-grained sediment deposits. Samples will be collocated with the 8 fish sampling locations, provided fine grained sediment deposits can be found. Three additional sediment sample locations will be added in the vicinity of South Pond for a total of eleven (11) samples. The additional three locations will be as follows: 2 samples will be collected within the wetland immediately up-gradient from South Pond and 1 additional sample will be collected within South Pond.

4.2 Anticipated Schedule

September 25, 2012 - Deploy PISCES samplers

October 10-11, 2012 – Retrieve PISCES samplers, collect fish and sediment samples, and submit samples to labs

October - ?
Await sample results

? – January 2013
Report writing (anticipate 2 months)

February 2013
Circulate draft report (1 month)

March 2013

- Write final report incorporating comments (1 month)
- Completed report expected March 31, 2012

5 Resources and Constraints:

5.1 Staff

Several Department staff will be needed to implement this work plan. It is anticipated that PISCES deployment and retrieval as well as fish tissue and sediment sampling will be accomplished by utilizing staff within the NYSDEC Bureau of Habitat, primarily the Natural Resource Restoration Unit and PISCES program staff out of the Rome field station. Document review and/or some oversight may include USEPA, DEC Bureau of Habitat, and staff from other divisions within the DEC, specifically DER and OGC. The analyses of PISCES and fish tissue samples will be done by staff at the NYSDEC laboratory at the Hale Creek field station. Sediment samples will be analyzed by Test America Laboratories, Inc.

5.2 Materials

The following is a preliminary supply list. It is anticipated that most of this equipment is on-hand and available within the Bureau of Habitat, but that many of the single-use items will need to be purchased.

- 20 Hassett-style PISCES samplers
- O-ring gaskets
- hexane solvent (approx. 5 liters)
- syringes
- aluminum foil
- anchor blocks
- 2 dip nets
- buckets
- metric ruler
- plastic sample bags
- labels
- rinse water
- ice and/or dry ice
- membranes
- new disk filters
- spiking solution (see attached PISCES SOP)
- coolers
- polypropylene rope
- backpack electrofishing unit
- seine
- gram scale
- stainless steel trowel
- WILDCO® Petite Ponar® Grab, 6" x 6"
- sample jars
- nitrile gloves
- distilled water

5.3 Constraints

Possible constraints include: schedule, site access, work load at Hale Creek Lab, staff availability, and budgetary/equipment purchases.

6 List of Figures

7 Attachments

- NYSDEC *Contaminant Track-down With PISCES - Standard Operating Procedures*, June 2007

- NYSDEC *Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis*, October 2002
- NYSDEC *PCB Track-down Using PISCES – upper West Branch Delaware River Watershed*, December2005
- USEPA *Optimization Evaluation – Sidney and Richardson Hill Road Landfills*, Revised Draft dated April 4, 2012

8 Literature Cited

Barton & Loguidice, P.C. March 2009. Final Remedial Action (RA) Report – Remedial Action for Herrick Hollow Creek. Prepared for Amphenol Corporation and Honeywell. Syracuse, NY.

New York State Department of Environmental Conservation. October 2002. Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis. Bureau of Habitat, Division of Fish, Wildlife and Marine Resources. Albany, NY.

New York State Department of Health. 2011-2012 Health Advice on Eating Sportfish and Game.

Parsons. August 2007. Final Interim Remedial Action Report – Remedial Work Element I Remedial Excavations and Capping Richardson Hill Road Landfill Site. Prepared for Amphenol Corporation and Honeywell. Liverpool, NY.

Parsons. August 2007. Final Interim Remedial Action Report – Remedial Work Element II Groundwater Extraction and Treatment Richardson Hill Road Landfill Site. Prepared for Amphenol Corporation and Honeywell. Liverpool, NY.

Preddice, T. June 2007. Contaminant Track-down With PISCES - Standard Operating Procedures. Hale Creek Field Station, Bureau of Habitat, Division of Fish, Wildlife and Marine Resources, NYSDEC. Gloversville, NY.

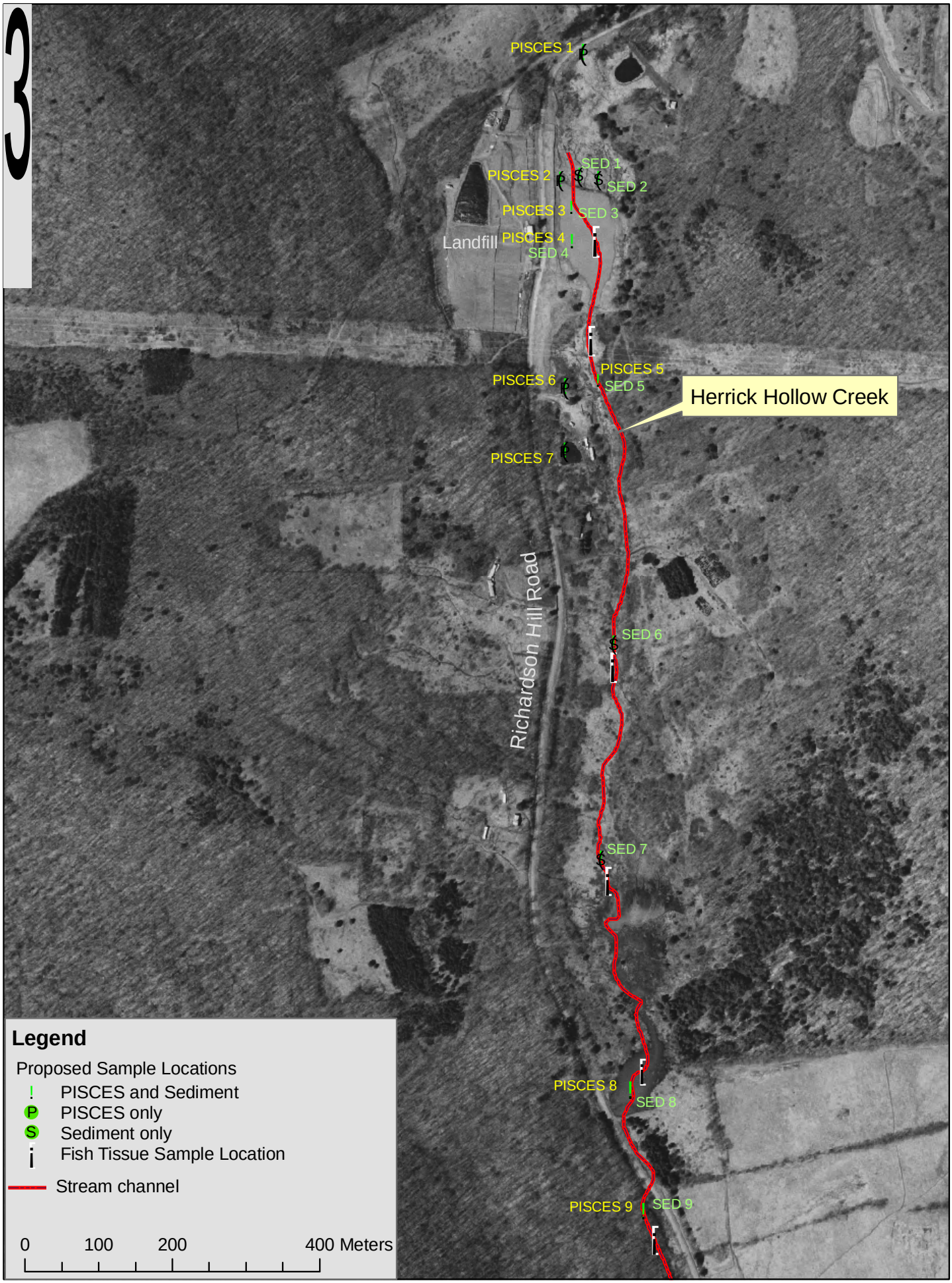
Preddice, T. December 2006. PCB Track-down Using PISCES – upper West Branch Delaware River Watershed. Hale Creek Field Station, Bureau of Habitat, Division of Fish, Wildlife and Marine Resources, NYSDEC. Gloversville, NY.

United States Environmental Protection Agency. April 2012. Draft Optimization Evaluation – Sidney and Richardson Hill Road Landfills. Office of Superfund Remediation and Technology Innovation (EPA OSRTI).

United States Environmental Protection Agency. September 1997. Record of Decision – Richardson Hill Road Landfill Site. USEPA Region II. New York, NY.

Richardson Hill Road Landfill - 2012 PISCES Study

Figure 1 - HHC Sampling Locations



Richardson Hill Road Landfill - 2012 PISCES Study

Figure 2 - Trout Creek Sampling Locations