

C&A

Bishop Tube

May 1, 1980

*Tim:  
note formal  
paragraphs  
JES*

Aquatic Biology Investigation - Streams  
Little Valley Creek Watershed (1.15.0)  
Chester County  
November 27, 1979

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On November 27, 1979, the writer conducted an aquatic biology investigation to determine the extant water quality in Little Valley Creek, a tributary to Valley Creek (Schuylkill River Drainage).

Four representative chemical and biological stations were selected. Temperature, pH, dissolved oxygen, and specific conductance were measured in the field; non-composite grab samples were collected in 500 ml bottles for additional analysis, with separate samples fixed for metals and cyanides. Bacteria samples were also taken and latter analyzed for fecal coliforms and fecal strep. Benthic macroinvertebrates were collected qualitatively using a hand-screen.

An analysis of the chemical and biological data expressed in Tables 1 and 2 follows:

STATION 1: East Branch, Little Valley Creek - downstream of Old Lincoln Highway; 7.76°/3.23°/ on USGS quad 08212; 4.65 river miles upstream of confluence with Valley Creek.

Moderate siltation limited habitable substrate, but this station had the greatest diversity of aquatic life. Water quality was deemed good.

STATION 2: Little Valley Creek - Below Bishop Tube and U.S. route 30; 7.80°/75.00°/ on USGS 0821.2; 3.90 river miles.

Water Chemistry data indicated high levels of suspended solids, nitrate-nitrogen, fluoride, aluminum, chromium, iron and nickel. Biological sampling revealed small populations of pollution-sensitive organisms. Water quality was deemed poor due to toxics.

STATION 3: Little Valley Creek - below Cedar Hollow Road and National Rolling Mills; 9.76°N/0.25°W on USGS 0821.2; 2.0 river miles.

Water chemistry data indicated a high fluoride concentration and a measurable level of cyanides. Moderate siltation has reduced habitable areas. Populations and diversity of aquatic organisms were very low due to the affect of toxics. Stream conditions were poor.

STATION 4: Little Valley Creek - N. Valley Road; 10.60°N/15.70°W on USGS 0822.3; 1.2 river miles.

Water chemistry data again indicated elevated levels of fluorides and cyanides. The biological community's reaction to toxics is reduced number of both individuals and taxonomic groups. Stream conditions did not improve from those observed at station 3.

#### Summary and Conclusions

Industrial point and non-point sources continue to degrade the water quality of Little Valley Creek. The aquatic community of the stream was very depressed, in both biomass (number of individuals) and diversity (number of taxa), due to toxic components contributed by three known industrial sources.

Station 2 below the known point source discharge of Bishop Tube, exceeded Water Quality Criteria of Chapter 93 for fluorides, aluminum, chromium, iron, nickel and zinc. Alkalinity was reduced at this station apparently by the discharge. Low alkalinity generally increases toxicity.

Known non-point sources, National Rolling Mills and Conrail's Paoli Car Shop, exist above Stations 3 and 4, respectively. Station 3 below National Rolling Mills showed a very depressed aquatic community. Cyanide contaminated groundwater discharging to Little Valley Creek is most likely the cause of the toxic effect. The cyanide contamination is present due to past leakages in an industrial process.

Station 4 receives drainage and groundwater flow from Conrail's Paoli electric train repair facility. PCB's have been found in relatively high concentrations in sediment samples below the facility. PCB's have been described as producing toxic effects on aquatic communities. The combination of the upstream sources of toxics and PCB's originating from the train shop no doubt is the cause of the severe depression of the aquatic community. Fish flesh samples collected on December 16, 1979 and March 11, 1980 contained elevated levels of PCB's, illustrating the bioconcentration potential of the chemical.

#### Recommendations

1. Enforcement action should be taken to cease the current discharge from Bishop Tube. Such action should seek retribution for stream damage already incurred.

*Review Bishop  
Tube Discharge  
status.*

*alone*

*5/14/80 memo to  
KW.*

2. Measures to expedite National Polling Hills ground-water recovery and treatment operation should be implemented.
3. PCB's originating from Conrail's Paoli facility are a continuing threat to the ecological health of Little Valley Creek. Enforcement actions should be initiated to contain and recover PCB's lost to the environment.

cc: Aquatic Biological Section  
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20042.2



AQUATIC BIOLOGICAL INVESTIGATION

## Benthic Invertebrates

Table: 2

Name of Stream: Little Valley Creek

County: Chester

Date: November 27, 1979

	STATIONS			
	1	2	3	4
<u>TURBELLARIA (Flatworms)</u>				
Planariidae	-	P	-	-
<u>ANNELIDA (Earthworms, Leeches)</u>				
Oligochaeta	-	P	-	-
Tubificidae	-	P	-	-
<u>ISOPODA (Sow Bugs)</u>				
Asellidae				
Lirceus	-	P	-	-
<u>AMPHILOPODA (Scuds)</u>				
Gammaridae				
Gammarus	P	P	-	-
<u>EMEMEROPTERA (Mayflies)</u>				
Ephemeridae				
Ephemerella	P	-	-	-
Baetidae				
Baetis	C	-	-	-
Heptageniidae				
Stenonema	-	-	-	P
← Iron	A	-	-	-
<u>TRICHOPTERA (Caddisflies)</u>				
Hydropsychidae				
Hydropsyche	P	P	P	P
← Cheumatopsyche	-	-	P	P
Philopotamidae				
Wormaldia	P	-	-	-
Glossosomatidae				
Glossosoma	-	-	P	P
<u>COLEOPTERA (Beetles)</u>				
Elmidae				
Stenelmis	P	-	-	-
Hydrophilidae				
Berosus	P	-	-	-
<u>DIPTERA (Midges, Flies)</u>				
Tipulidae				
Tipula	P	-	-	-
← Antocha	P	-	-	-
Chironomidae	A	P	C	C
Total Taxa	11	7	4	4

A = Abundant (greater than 100) C = Common (25-100) P = Present (less than 25)