

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT**

**EVALUATION OF LIMESTONE TREATMENT OF ACIDIC MINE DRAINAGE
IN SWATARA CREEK BASIN, SCHUYLKILL COUNTY, PENNSYLVANIA**

Acidic mine drainage (AMD) from abandoned anthracite mines has degraded water resources in the 48 mi² northern Swatara Creek Basin. To neutralize the AMD, with a goal of remediating approximately 25 miles (67 percent) of degraded streams in the basin, a variety of limestone treatment systems have been constructed (fig. 10). Most of the limestone treatment systems were installed during fall 1996 and spring 1997. The type and size of the treatment system was based on streamflow rates and chemistry determined by preliminary monitoring and field trials. The treatments, which include limestone-sand dosing, open limestone channels, anoxic and oxic limestone drains, and limestone diversion wells, were constructed by the Schuylkill County Conservation District and the Northern Swatara Creek Watershed Association, with technical assistance from the USGS and the Pennsylvania Department of Environmental Protection (PaDEP). Each treatment has different advantages and disadvantages; however, all suffer from possible complication associated with variability of flow rates and chemistry of the AMD-contaminated water and from uncertainties about efficiency and longevity of the treatment.

To resolve uncertainties about treatment designs (efficiency and longevity), limestone dissolution in response to variations in water chemistry and coating (armoring) by iron and aluminum hydroxides, and appropriate uses of the various limestone treatments, the USGS has established monitoring stations upstream and downstream of each treatment. During base-flow and high-flow conditions in 1995-2003, data on discharge rate and water quality at 48 stations in the Swatara Creek basin and 5 stations in adjacent watersheds (table 5) were collected to characterize untreated mine drainage, treatment-system performance, and cumulative downstream effects. In spring-summer 1996, two streamflow stations on Swatara Creek, Site C3, at Newtown (station 0157155014) and Swatara Creek near Ravine (station 01571820) were installed for continuous streamflow and water-quality monitoring. The data for these stations indicate cumulative effects of AMD remediation throughout the northern Swatara Creek basin.

Limestone sand dosing and open limestone channels are the simplest treatment systems where limestone is added directly to the stream channel semiannually or less frequently. Limestone sand, which can dissolve rapidly because of its small size (<1/8 inch), was dumped into Coal Run (14 tons) between stations C4 and C6 on September 4, 1996, and into Lorberry Creek (150 tons) below station E2 on February 13-14, 1997 (fig. 10). An open limestone channel was constructed within a 110-ft long segment of Swatara Creek at station B2 (fig. 10) on March 21, 1997. A total of 44 tons of sand-size fragments and 70 tons of larger fragments (1-4 inches) were installed as a series of alternating berms extending part way across the 15-ft-wide channel from opposite sides of the stream.

A limestone drain is another relatively simple treatment method, which involves the burial of limestone in air-tight trenches that intercept acidic discharge water. Keeping oxygen out of contact with the discharge water minimizes the potential for oxidation of ferrous iron and the consequent precipitation of ferric-iron armoring as iron hydroxides. Furthermore, keeping carbon dioxide within the drain can enhance limestone dissolution and alkalinity production. Limestone drains were constructed on March 15, 1995, at station E3 to treat a small acidic discharge (10-30 gpm, oxic inflow; 44 tons limestone) along Lower Rausch Creek May 21, 1997, at station A1 to treat a large discharge (50-200 gpm, anoxic inflow; 400 tons limestone) at the headwaters of Swatara Creek; and on May 20, 2000, at station C0-1 to treat a large discharge (50-500 gpm; oxic inflow; 880 tons limestone) near the headwaters of Swatara Creek (fig. 10).

In a limestone diversion well, acidic water is diverted from upstream points and the hydraulic force of the piped flow is deflected upward through limestone fragments inside 4-ft diameter "wells." Hydraulic churning abrades limestone forming fine particles and preventing the buildup of iron or aluminum hydroxides armoring. On November 14, 1995, a pair of diversion wells was installed to treat water diverted from Swatara Creek at station C2; on July 13, 1997, a single diversion well was installed to treat water from Martin Run at station C8 (fig. 10); and, on November 18-19, 1998, another pair of diversion wells was installed to treat water diverted from Lorberry Creek above station E2-0. Approximately 1 ton of limestone is consumed weekly by each operating diversion well.

Constructed wetlands for treatment of mine drainage can attenuate the transport of dissolved and suspended pollutants by promoting the production of alkalinity and the precipitation and deposition of iron and other metals. For net acidic water (acidity > alkalinity), wetlands that have compost and/or limestone substrates can be appropriate. The organic matter in the compost provides a substrate for plant rooting and for microbial reduction of sulfate. In December 1998, a 3-acre aerobic wetland system with limestone and compost substrate was installed near the mouth of Lower Rausch Creek between stations E3-1 and E3-2, and in December 2001, a 3-acre aerobic wetland system that intercepts outflow from the limestone diversion wells on Lorberry Creek below station E2-0 began operation. At the inflow to the Lorberry wetlands, a hopper with water-powered auger was installed to deliver pelletized lime or limestone as needed. The main objective for these wetlands is to reduce the downstream transport of metals, with a secondary objective of providing additional alkalinity.

Additional data for this project can be found in this report on pages 254-310. For additional information, contact Charles Cravotta at the USGS Pennsylvania Water Science Center, 215 Limekiln Road, New Cumberland, PA 17070; 717-730-6963 (email: cravotta@usgs.gov).

ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
 SWATARA CREEK PROJECT--Continued

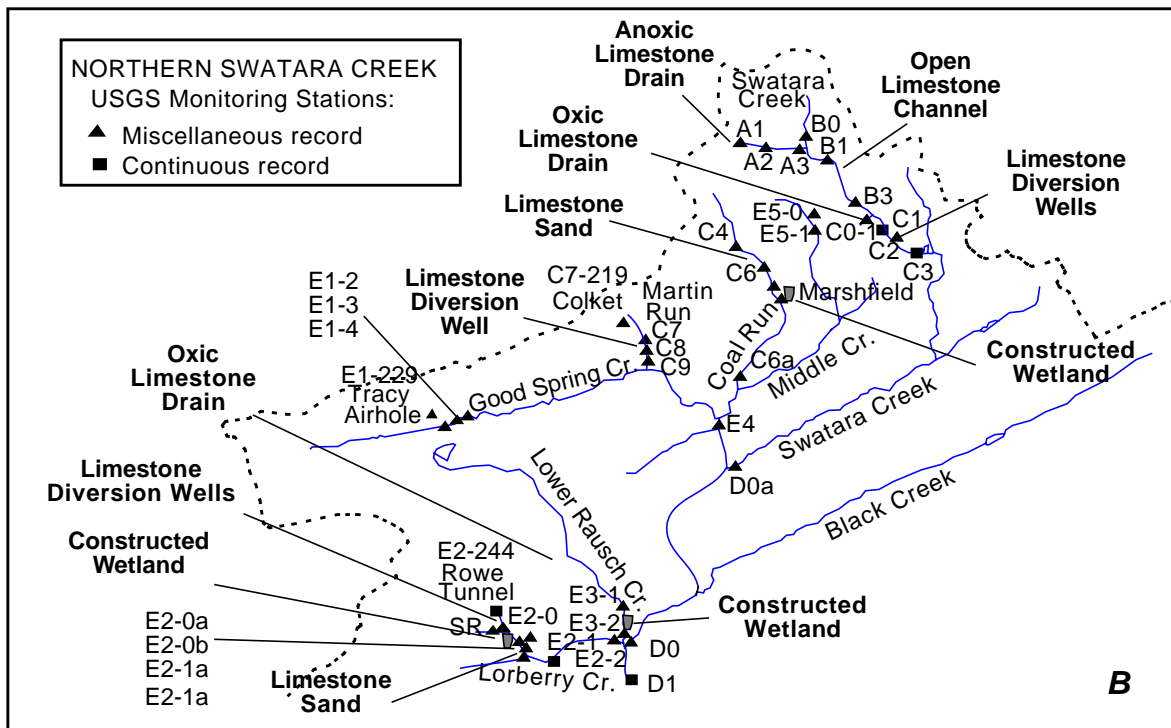
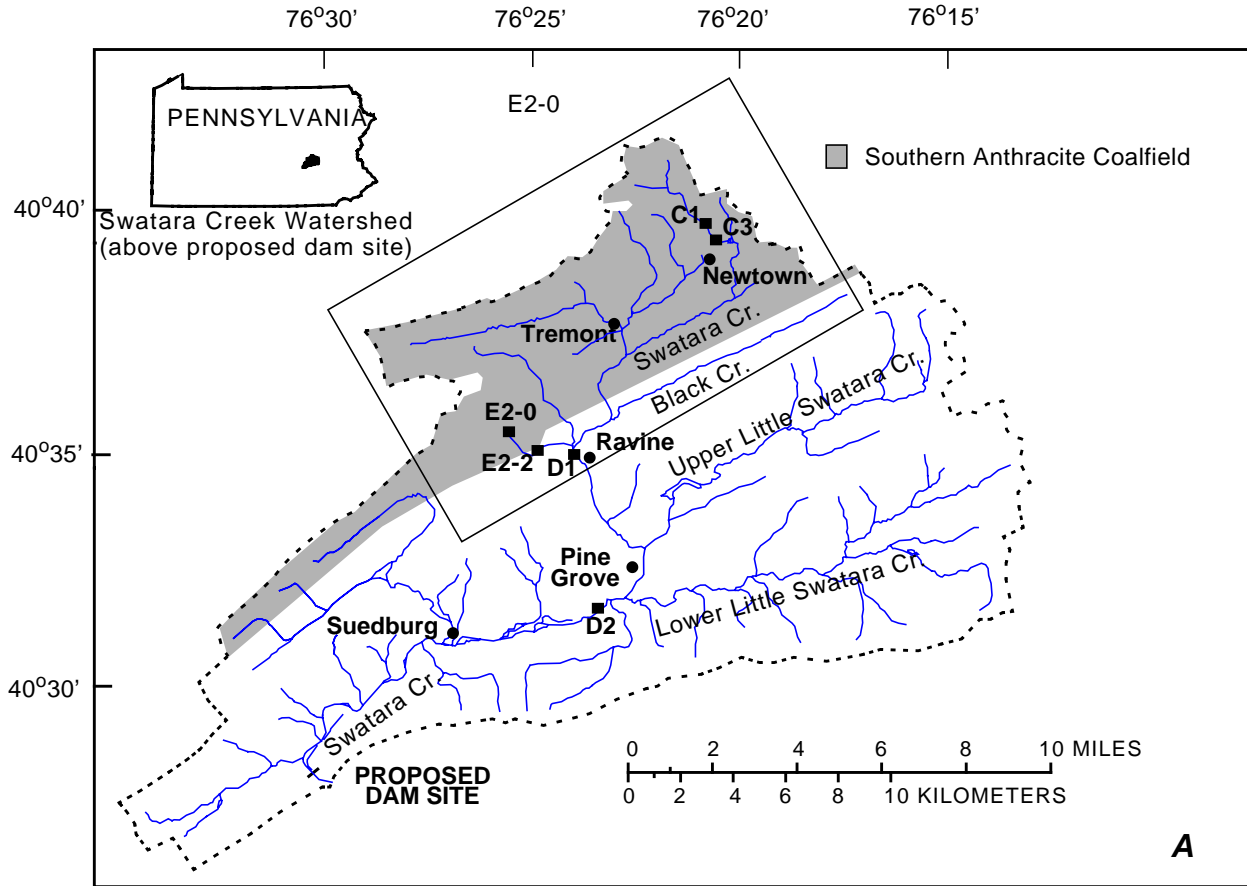


Figure 10.--Locations of water-quality and streamflow monitoring stations in the Swatara Creek Basin, Lebanon and Schuylkill Counties, Pennsylvania: A, continuous monitoring stations on Swatara Creek above the proposed dam for Swatara State Park Reservoir; B, monitoring stations within the Southern Anthracite Coalfield, above Ravine (area denoted in A).

ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued

TABLE 5.--Swatara Creek project station list.

REMARKS.--All samples collected by the U.S. Geological Survey. Abbreviations used in the following table include: AB-above; BL-below; NR-near; DS-downstream, US-upstream, ALD-anoxic limestone drain; OLD-oxic limestone drain; OLC-open limestone channel; LS-limestone sand; LDW-limestone diversion well; n.a.-not applicable.

LOCAL ID	STATION NUMBER	STATION NAME	LATITUDE	LONGITUDE	DRAINAGE AREA
CONTINUOUS-RECORD STATIONS					
C1	0157155010	SWATARA CREEK, SITE C1, 350 FT AB LDW, AB SR209 BRIDGE AT NEWTOWN, PA	40°39'34"	76°20'50"	2.58
C3	0157155014	SWATARA CREEK, SITE C3, 350 FT BL LDW, BL SR209 BRIDGE AT NEWTOWN, PA	40°39'28"	76°20'43"	2.92
E2-244	403542076263201	ROWE DRAINAGE TUNNEL, SITE E2-244, NEAR JOLIETT	40°35'42"	76°26'32"	n.a.
E2-1	01571778	LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'15"	76°25'35"	3.59
D1	01571820	SWATARA CREEK NEAR RAVINE, PA	40°34'50"	76°24'18"	43.3
D2	01572025	SWATARA CREEK NEAR PINE GROVE, PA	40°31'57"	76°24'09"	116
MISCELLANEOUS-RECORD STATIONS					
A1-199	404032076222901	WM CARL BUCK MTN MINE, SITE A1-199, NEAR NEWTOWN	40°40'32"	76°22'29"	n.a.
A2	0157154970	NORTHWEST TRIBUTARY TO SWATARA CREEK, SITE A2, AT ALD OUTFLOW, NEAR NEWTOWN, PA	40°40'32"	76°22'25"	.25
A3	0157154972	NORTHWEST TRIBUTARY TO SWATARA CREEK, SITE A3, 1500 FT BELOW ALD, NEAR NEWTOWN, PA	40°40'32"	76°21'59"	.40
B0	0157154960	SWATARA CREEK, ABOVE NORTHWEST TRIBUTARY, SITE B0, NEAR NEWTOWN, PA	40°40'34"	76°21'57"	1.14
B3	0157154984	SWATARA CREEK, BELOW NORTHWEST TRIBUTARY, SITE B3, 400 FT BELOW OLC, NEAR NEWTOWN, PA	40°40'22"	76°21'36"	1.90
C0-1	403955076211801	HEGINS MINE DISCHARGE, SITE C0-1, AT NEWTOWN, PA	40°39'55"	76°21'18"	n.a.
	403955076211802	HEGINS MINE DISCHARGE, TREATED, AT NEWTOWN, PA	40°39'55"	76°21'18"	n.a.
C2	0157155012	SWATARA CREEK, SITE C2, AT LDW OUTFLOW, AT NEWTOWN, PA	40°39'31"	76°20'47"	2.65
D0a	01571552	SWATARA CREEK AT TREMONT, PA	40°37'08"	76°23'09"	9.81
E4	01571593	GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA	40°37'35"	76°23'15"	14.0
E3-1	01571758	LOWER RAUSCH CREEK, SITE E3-1 ABOVE WETLAND, NEAR LORBERRY JUNCTION, PA	40°35'34"	76°24'40"	4.65
E3-2	01571760	LOWER RAUSCH CREEK, SITE E3-2 BELOW WETLAND, AT LORBERRY JUNCTION, PA	40°35'22"	76°24'42"	4.65
E2-0b	01571773	LORBERRY CREEK DIV WELLS OUTFLOW NR LORBERRY, PA	40°35'36"	76°26'25"	1.01
E2-0	01571774	LORBERRY CREEK, SITE E2-0, AT LORBERRY, PA	40°35'32"	76°26'22"	1.15
SR	01571776	STUMPS RUN AT LORBERRY, PA	40°35'30"	76°26'23"	.65
	0157177610	LORBERRY CREEK WETLANDS INFLOW AT LORBERRY, PA	40°35'29"	76°26'23"	
	0157177614	LORBERRY CR WETLANDS CELL 2 OUTFLOW AT LORBERRY	40°35'28"	76°26'20"	
	0157177618	LORBERRY CR WETLANDS CELL 4 OUTFLOW AT LORBERRY	40°35'27"	76°26'19"	
	0157177620	LORBERRY CREEK BELOW WETLANDS AT LORBERRY, PA	40°35'27"	76°26'17"	1.80
SH	403521076260601	SHADLE MINE SHAFT AT LORBERRY, PA	40°35'21"	76°26'06"	n.a.
	01571777	LORBERRY CREEK ABOVE PANTHER HEAD DISCHARGE NEAR LORBERRY JUNCTION, PA	40°35'11"	76°25'55"	2.11
	0157177780	PANTHER HEAD, 500 FT BELOW DISCHARGE TO LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'10"	76°25'56"	.01
	0157177790	UNNAMED TRIBUTARY TO LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'07"	76°25'48"	1.14
E2-2	01571780	LORBERRY CREEK ABOVE LOWER RAUSCH CREEK AT LORBERRY JUNCTION, PA	40°35'20"	76°24'43"	4.17
D0	01571798	SWATARA CREEK BELOW TR412 BRIDGE AT LORBERRY JUNCTION, PA	40°35'18"	76°24'37"	42.3

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

404032076222901 -- WM Carl Buck Mtn Mine, Site A1-199, nr Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1315	1028	89203	.01	388	.0	.3	3	4.9	4.9
JAN 05...	1330	1028	89203	.02	213	.0	2.2	20	4.9	4.8
MAR 04...	1315	1028	89203	.01	155	.0	1.6	14	4.6	5.0
APR 21...	1315	1028	89203	.02	408	.0	1.2	11	5.0	5.0
JUN 03...	1245	1028	89203	.02	400	.8	1.1	10	5.1	4.9
JUL 21...	1245	1028	89203	.02	404	16	2.5	25	5.0	4.9
SEP 08...	1215	1028	89203	.01	389	.0	1.7	16	5.1	4.9

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 29...	206	10.9	3.60	3.60	7.20	7.40	1.40	1.40	12.9	13.1
JAN 05...	212	9.30	3.80	3.90	8.00	8.20	1.50	1.50	11.7	12.0
MAR 04...	201	9.60	3.60	3.30	6.40	6.40	1.30	1.30	10.9	11.3
APR 21...	223	9.57	4.00	3.90	7.40	7.50	1.40	1.40	11.6	11.5
JUN 03...	208	9.93	3.90	3.90	7.50	7.60	1.50	1.50	12.1	11.8
JUL 21...	206	10.5	3.50	3.70	6.50	6.80	1.30	1.30	10.6	11.0
SEP 08...	191	11.2	3.70	3.60	6.90	6.80	1.50	1.40	12.2	11.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

404032076222901 -- WM Carl Buck Mtn Mine, Site A1-199, nr Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfltrd recover -able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 29...	3.60	14.9	<.010	59.7	.010	<.030	<.020	500	500	.060
JAN 05...	3.10	16.6	<.010	62.4	.010	<.030	<.020	500	500	.070
MAR 04...	3.60	--	--	--	--	--	--	400	400	--
APR 21...	4.10	17.2	--	70.0	--	--	--	500	500	--
JUN 03...	3.30	17.9	--	63.8	--	--	--	500	500	--
JUL 21...	3.30	16.3	--	39.0	.040	--	--	400	400	--
SEP 08...	3.80	17.8	<.010	57.9	.030	<.030	<.020	300	300	.060

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover -able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover -able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover -able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover -able, µg/L (01092)
OCT 29...	11300	11700	1190	1220	80.0	76.0	168	165
JAN 05...	11100	11400	1260	1300	88.0	89.0	208	207
MAR 04...	9890	9910	1170	1170	70.0	70.0	160	160
APR 21...	12300	12700	1070	1060	85.0	85.0	180	185
JUN 03...	11800	11900	1190	1200	85.0	85.0	175	175
JUL 21...	8280	8670	1140	1180	80.0	82.0	92.0	103
SEP 08...	13200	12700	1180	1140	70.0	70.0	150	140

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154970 -- NW Trib to Swatara Cr, Site A2, near Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1330	1028	89203	.11	272	.0	.4	3	6.4	6.6
JAN 05...	1315	1028	89203	.07	79	29	1.8	17	6.3	6.7
MAR 04...	1300	1028	89203	.03	52	.0	.8	7	6.0	6.8
APR 21...	1300	1028	89203	.07	277	.0	.6	5	6.8	6.5
JUN 03...	1230	1028	89203	.04	256	.8	.8	7	6.8	6.9
JUL 21...	1230	1028	89203	.13	266	.0	1.0	9	6.5	6.5
SEP 08...	1200	1028	89203	.02	224	.0	.8	8	6.7	6.7

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 29...	288	13.3	30.7	31.7	6.20	6.40	1.60	1.60	14.3	14.3
JAN 05...	280	11.0	31.4	31.9	6.20	6.30	1.50	1.50	11.7	12.1
MAR 04...	295	9.60	33.3	33.0	5.30	5.30	1.40	1.40	11.9	11.9
APR 21...	311	9.36	33.0	33.3	6.20	6.20	1.50	1.50	12.6	12.4
JUN 03...	290	9.38	34.9	36.0	6.00	6.20	1.50	1.50	12.1	12.6
JUL 21...	290	10.1	36.7	35.4	5.50	5.40	1.40	1.40	12.0	11.7
SEP 08...	275	11.7	37.0	36.1	5.50	5.30	1.50	1.50	12.2	12.1

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154970 -- NW Trib to Swatara Cr, Site A2, near Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfiltered recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 29...	7.50	16.7	<.010	47.7	.020	<.030	<.020	<100	<100	.050
JAN 05...	65.3	15.6	<.010	48.7	.010	<.030	<.020	100	100	.070
MAR 04...	76.0	--	--	--	--	--	--	200	200	--
APR 21...	6.50	17.6	--	56.0	--	--	--	<100	<100	--
JUN 03...	17.0	17.4	--	48.9	--	--	--	<100	<100	--
JUL 21...	7.50	13.7	--	43.1	.080	--	--	<100	<100	--
SEP 08...	69.0	18.3	<.010	41.4	.050	<.030	<.020	<100	<100	.050

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered recover- able, µg/L (01092)
OCT 29...	8200	8430	1160	1200	51.0	65.0	140	147
JAN 05...	8040	8260	1100	1130	60.0	58.0	137	138
MAR 04...	5980	5950	1060	1050	50.0	50.0	110	110
APR 21...	8750	8850	1040	1010	65.0	65.0	145	150
JUN 03...	6930	7170	1080	1090	55.0	60.0	120	125
JUL 21...	4960	4670	1090	1070	55.0	54.0	73.0	73.0
SEP 08...	7260	6960	1030	1000	50.0	45.0	105	95.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154972 -- NW Trib to Swatara Cr, Site A3, near Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1300	1028	89203	8.4	318	340	10.8	97	6.4	6.4
JAN 05...	1300	1028	89203	5.2	163	73	10.4	83	6.1	6.7
MAR 04...	1230	1028	89203	1.1	139	16	12.4	98	5.6	6.8
APR 21...	1200	1028	89203	.82	254	5.1	11.2	100	7.3	6.6
JUN 03...	1200	1028	89203	1.1	213	19	10.0	93	7.2	6.6
JUL 21...	1200	1028	89203	1.1	217	42	10.4	101	6.2	6.7
SEP 08...	1130	1028	89203	1.1	291	100	10.3	100	6.6	7.3

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover-able, mg/L (00929)
OCT 29...	116	10.7	7.90	7.90	3.10	3.20	2.00	2.00	7.60	7.70
JAN 05...	127	6.00	8.70	8.80	3.40	3.50	1.60	1.60	5.90	5.90
MAR 04...	141	5.30	12.3	12.1	3.70	3.70	1.50	1.50	7.00	6.70
APR 21...	217	10.4	16.3	16.4	6.00	5.90	1.40	1.30	10.8	10.6
JUN 03...	199	12.1	17.3	17.9	6.00	6.10	1.40	1.40	10.1	10.0
JUL 21...	209	14.1	17.7	18.0	5.50	5.60	1.40	1.50	9.60	9.80
SEP 08...	212	14.1	21.5	21.4	6.10	6.10	1.50	1.60	11.3	11.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154972 -- NW Trib to Swatara Cr, Site A3, near Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered, end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfiltered, recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 29...	11.0	8.40	<.010	25.3	.110	<.030	<.020	<100	700	.125
JAN 05...	10.7	8.03	<.010	29.1	.260	<.030	<.020	100	300	.030
MAR 04...	17.0	--	--	--	--	--	--	200	300	--
APR 21...	14.4	15.2	--	53.9	--	--	--	<100	200	--
JUN 03...	7.00	15.3	--	49.5	--	--	--	<100	200	--
JUL 21...	17.2	13.6	--	43.2	.080	--	--	<100	200	--
SEP 08...	26.8	16.2	<.010	49.3	.170	<.030	<.020	<100	200	.040

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered, recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered, recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered, recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered, recover- able, µg/L (01092)
OCT 29...	1330	2320	590	610	25.0	15.0	64.0	77.0
JAN 05...	2040	2380	560	580	23.0	26.0	82.0	90.0
MAR 04...	1210	1330	660	650	25.0	25.0	70.0	70.0
APR 21...	3160	4140	820	800	55.0	55.0	100	115
JUN 03...	1670	3490	830	830	50.0	50.0	65.0	90.0
JUL 21...	710	2510	800	820	47.0	49.0	31.0	53.0
SEP 08...	260	7190	760	790	40.0	45.0	30.0	95.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154960 -- Swatara Creek, ab NW Trib, Site B0, nr Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1245	1028	89203	8.4	512	23	10.9	96	4.2	4.4
JAN 05...	1245	1028	89203	4.9	271	5.0	10.2	80	4.2	4.4
MAR 04...	1215	1028	89203	3.4	278	1.0	12.8	98	4.2	4.4
APR 21...	1145	1028	89203	2.1	506	1.2	11.2	100	4.3	4.5
JUN 03...	1145	1028	89203	3.0	462	3.3	9.6	92	4.4	4.4
JUL 21...	1145	1028	89203	.45	454	2.7	9.8	100	4.3	4.2
SEP 08...	1115	1028	89203	2.1	511	10	9.3	96	4.3	4.2

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 29...	70.0	9.90	.900	.800	.700	.700	1.00	1.00	5.60	5.70
JAN 05...	85.0	5.00	1.20	1.20	1.00	1.00	.700	.700	6.00	6.00
MAR 04...	77.0	4.00	1.10	1.10	1.00	1.00	.500	.500	6.00	5.70
APR 21...	82.0	10.5	1.20	1.20	1.10	1.10	.500	.500	5.50	5.40
JUN 03...	79.0	13.4	1.20	1.10	1.10	1.10	.500	.500	6.00	6.00
JUL 21...	85.0	16.5	1.00	1.00	1.00	1.00	.300	.300	5.80	5.90
SEP 08...	77.0	16.9	1.10	1.00	1.20	1.20	.500	.500	5.50	5.40

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154960 -- Swatara Creek, ab NW Trib, Site B0, nr Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfltrd end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfltrd recover -able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 29...	.000	6.60	<.010	9.67	.060	<.030	<.020	700	800	.060
JAN 05...	.000	10.2	<.010	11.4	.140	<.030	<.020	600	600	.060
MAR 04...	.000	--	--	--	--	--	--	700	700	--
APR 21...	.200	9.66	--	11.7	--	--	--	700	700	--
JUN 03...	.000	11.6	--	10.2	--	--	--	900	900	--
JUL 21...	.000	10.6	--	10.9	.050	--	--	900	1000	--
SEP 08...	.000	10.8	.020	9.99	.060	<.030	<.020	600	600	.070

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover -able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover -able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover -able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover -able, µg/L (01092)
OCT 29...	210	290	150	150	<5.00	9.00	29.0	27.0
JAN 05...	140	180	200	210	6.00	<5.00	36.0	33.0
MAR 04...	140	160	200	200	<5.00	10.0	35.0	35.0
APR 21...	110	160	150	150	10.0	10.0	40.0	45.0
JUN 03...	140	180	190	190	10.0	10.0	40.0	40.0
JUL 21...	110	190	190	190	9.00	10.0	24.0	25.0
SEP 08...	150	330	230	230	10.0	10.0	35.0	35.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154984 -- Swatara Cr, bl NW Trib, Site B3, near Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1230	1028	89203	17	479	110	11.0	98	4.9	5.0
JAN 05...	1230	1028	89203	10	230	24	10.1	79	5.2	5.2
MAR 04...	1200	1028	89203	4.5	245	6.0	12.8	99	5.0	5.3
APR 21...	1100	1028	89203	2.9	389	6.2	11.4	101	6.2	6.1
JUN 03...	1115	1028	89203	1.9	334	13	9.8	94	6.6	6.1
JUL 21...	1130	1028	89203	1.5	308	24	9.8	100	6.3	6.3
SEP 08...	1100	1028	89203	.99	379	16	9.8	100	6.5	6.4

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover-able, mg/L (00929)
OCT 29...	68.0	10.0	2.70	2.70	1.60	1.30	1.30	1.30	5.80	5.90
JAN 05...	80.0	5.10	3.00	3.20	1.60	1.70	.900	1.00	6.00	5.80
MAR 04...	73.0	4.30	3.10	3.00	1.50	1.40	.700	.700	6.10	6.20
APR 21...	100	10.5	5.10	5.20	2.40	2.40	.700	.700	6.80	6.90
JUN 03...	99.0	13.6	5.90	6.00	2.50	2.50	.700	.700	7.10	7.00
JUL 21...	116	16.3	7.50	7.50	2.80	2.80	.700	.700	7.40	7.20
SEP 08...	128	16.1	10.3	10.2	3.50	3.40	.900	.900	8.50	8.10

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157154984 -- Swatara Cr, bl NW Trib, Site B3, near Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfiltered recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 29...	3.00	6.73	<.010	14.0	.070	<.030	<.020	600	800	.050
JAN 05...	1.90	9.31	<.010	17.3	.180	<.030	<.020	300	500	.040
MAR 04...	2.30	--	--	--	--	--	--	500	600	--
APR 21...	3.90	11.1	--	22.8	--	--	--	<100	600	--
JUN 03...	4.00	12.3	--	21.9	--	--	--	200	700	--
JUL 21...	4.50	11.5	--	23.8	.090	--	--	<100	700	--
SEP 08...	8.70	13.2	.020	29.9	.090	<.030	<.020	200	400	.070

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered recover- able, µg/L (01092)
OCT 29...	450	850	270	270	11.0	<5.00	44.0	42.0
JAN 05...	530	730	290	310	10.0	11.0	49.0	50.0
MAR 04...	220	340	290	280	10.0	10.0	45.0	45.0
APR 21...	820	1180	320	310	20.0	20.0	60.0	60.0
JUN 03...	470	1100	360	370	20.0	25.0	50.0	55.0
JUL 21...	210	1040	420	430	23.0	24.0	26.0	35.0
SEP 08...	110	1030	410	410	20.0	20.0	30.0	40.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

403955076211802 -- Hegins Mine Discharge, Treated, at Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1145	1028	89203	2.8	525	3.0	11.0	98	4.1	4.2
JAN 05...	1145	1028	89203	.30	288	.0	9.3	81	4.3	4.4
MAR 04...	1115	1028	89203	.22	313	.0	11.0	95	4.2	4.4
APR 21...	1030	1028	89203	.39	522	.0	11.3	101	4.1	4.3
JUN 03...	1030	1028	89203	.15	452	.6	10.4	94	4.7	4.4
JUL 21...	1030	1028	89203	.22	470	.0	11.5	100	4.2	4.1
SEP 08...	1030	1028	89203	.19	451	1.0	11.1	101	4.7	3.6

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 29...	382	10.1	11.8	11.3	29.3	27.7	1.50	1.70	5.20	4.90
JAN 05...	333	9.40	10.6	11.2	24.3	25.8	1.60	1.70	4.30	5.00
MAR 04...	374	9.10	11.0	11.1	26.3	26.1	1.60	1.60	5.60	5.90
APR 21...	379	10.1	11.4	11.4	26.2	27.2	1.70	1.60	6.00	5.90
JUN 03...	340	10.7	12.5	12.8	27.8	28.2	1.70	1.70	6.30	6.30
JUL 21...	394	10.9	12.6	13.0	33.3	34.7	1.70	1.70	4.60	4.50
SEP 08...	326	11.1	13.2	12.8	30.6	29.9	1.80	1.70	6.30	6.40

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

403955076211802 -- Hegins Mine Discharge, Treated, at Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfiltered, recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 29...	.000	4.39	<.010	160	.100	<.030	<.020	4400	4100	.110
JAN 05...	.000	4.89	<.010	140	.070	<.030	<.020	2500	2700	.110
MAR 04...	.000	--	--	--	--	--	--	3400	3400	--
APR 21...	.000	--	6.98	--	--	--	--	3300	3300	160
JUN 03...	.000	6.71	--	158	--	--	--	4400	4500	--
JUL 21...	.000	4.39	--	169	.100	--	--	5100	5200	--
SEP 08...	.000	6.84	<.010	170	.110	<.030	<.020	3300	3300	.110

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered, recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered, recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered, recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered, recover- able, µg/L (01092)
OCT 29...	220	320	1350	1290	115	110	296	279
JAN 05...	100	90.0	1110	1160	95.0	101	255	272
MAR 04...	90.0	140	1420	1430	110	110	300	295
APR 21...	150	160	1040	1020	105	105	285	290
JUN 03...	90.0	80.0	1220	1240	115	120	305	320
JUL 21...	110	110	1510	1530	141	147	209	223
SEP 08...	90.0	120	1370	1340	120	115	320	315

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157155012 -- Swatara Creek, Site C2, at Newtown, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1100	1028	89203	.06	461	74	8.5	76	5.4	5.5
JAN 05...	1030	1028	89203	.06	192	7.0	8.1	64	5.5	5.5
MAR 04...	1045	1028	89203	.13	245	9.0	11.8	91	5.3	5.5
APR 21...	0945	1028	89203	.07	434	3.3	9.9	88	5.5	5.4
JUN 03...	0945	1028	89203	.00	--	--	--	--	--	--
JUL 21...	0945	1028	89203	.09	409	14	9.7	97	5.3	5.2
SEP 08...	1000	1028	--	.00	301	36	5.8	60	6.5	--

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 29...	82.0	10.6	4.40	4.40	3.00	3.00	1.20	1.20	4.70	5.00
JAN 05...	97.0	5.30	5.20	5.20	3.10	3.10	.900	.900	5.40	5.00
MAR 04...	94.0	4.60	4.90	4.80	3.30	3.30	.900	.900	5.20	4.90
APR 21...	129	9.99	6.50	6.50	5.10	5.00	.800	.800	6.00	5.70
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUL 21...	164	15.2	8.90	8.70	8.20	8.10	.900	.900	5.60	5.80
SEP 08...	170	16.6	10.1	10.0	8.40	8.10	1.00	.900	6.40	6.20

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157155012 -- Swatara Creek, Site C2, at Newtown, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered, lab, mg/L as CaCO3 (00417)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phosphate, water, fltrd, mg/L as P (00671)	Aluminum, water, fltrd, µg/L (01106)	Aluminum, water, unfiltered, recoverable, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 29...	4.70	7.87	<.010	19.1	.060	<.030	<.020	300	700	.040
JAN 05...	4.40	12.1	<.010	17.0	.110	<.030	<.020	200	300	.050
MAR 04...	3.00	--	--	--	--	--	--	300	500	--
APR 21...	2.90	--	11.4	--	--	--	--	400	600	36.1
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUL 21...	1.70	8.65	--	48.5	.060	--	--	400	900	--
SEP 08...	--	10.2	<.010	53.0	.120	<.030	<.020	<100	600	.050

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered, recoverable, µg/L (01045)	Manganese, water, fltrd, µg/L (01056)	Manganese, water, unfiltered, recoverable, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, recoverable, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered, recoverable, µg/L (01092)
OCT 29...	220	630	240	250	16.0	12.0	43.0	42.0
JAN 05...	230	340	180	180	8.00	9.00	33.0	34.0
MAR 04...	130	240	260	260	15.0	15.0	50.0	45.0
APR 21...	340	570	280	290	25.0	25.0	70.0	75.0
JUN 03...	--	--	--	--	--	--	--	--
JUL 21...	70.0	390	460	460	37.0	36.0	51.0	54.0
SEP 08...	60.0	330	340	330	30.0	30.0	70.0	70.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571593 -- Good Spring Creek bl Middle Creek at Tremont, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 29...	1000	1028	89203	16	407	110	10.8	97	6.3	6.4
JAN 05...	0945	1028	89203	15	156	84	10.3	83	6.5	5.4
MAR 04...	1000	1028	89203	15	212	20	12.6	100	6.2	6.4
APR 21...	0915	1028	89203	15	311	12	11.1	101	7.2	6.5
JUN 03...	0915	1028	89203	15	268	15	9.9	95	7.2	6.4
JUL 21...	0900	1028	89203	15	254	10	10.4	100	6.9	6.2
SEP 08...	0900	1028	89203	14	240	7.0	9.9	100	7.1	6.8

Date	Specific conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 29...	119	10.2	7.90	7.90	4.60	4.60	2.90	3.00	6.00	6.10
JAN 05...	207	6.00	12.9	13.5	9.30	9.80	2.30	2.40	8.00	8.40
MAR 04...	220	5.60	13.3	13.4	9.20	9.40	1.60	1.60	9.50	9.90
APR 21...	245	11.0	16.2	16.2	11.8	11.7	1.60	1.50	8.50	8.40
JUN 03...	280	13.5	20.2	20.7	15.9	16.2	2.00	2.00	9.40	9.40
JUL 21...	278	15.0	20.1	20.4	15.1	15.0	1.80	1.80	8.40	8.50
SEP 08...	299	15.9	24.2	24.0	18.6	18.7	1.80	1.80	8.90	8.80

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571593 -- Good Spring Creek bl Middle Creek at Tremont, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, recover -able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 29...	9.00	7.64	<.010	29.7	.240	<.030	<.020	200	1000	.080
JAN 05...	2.10	13.5	<.010	58.4	.280	<.030	<.020	<100	600	.070
MAR 04...	7.20	--	--	--	--	--	--	<100	600	--
APR 21...	6.90	14.8	--	81.1	--	--	--	<100	400	--
JUN 03...	12.5	16.4	--	97.3	--	--	--	<100	300	--
JUL 21...	8.20	13.6	--	88.2	.180	--	--	<100	500	--
SEP 08...	10.9	14.3	<.010	118	.180	.050	<.020	<100	200	.090

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover -able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover -able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, recover -able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover -able, µg/L (01092)
OCT 29...	410	3590	410	540	22.0	24.0	33.0	45.0
JAN 05...	560	2150	620	680	20.0	23.0	58.0	67.0
MAR 04...	870	1620	750	770	25.0	25.0	60.0	60.0
APR 21...	720	1630	750	780	35.0	30.0	75.0	100
JUN 03...	490	1260	980	1000	35.0	35.0	90.0	65.0
JUL 21...	420	1000	1020	1030	40.0	38.0	46.0	48.0
SEP 08...	700	1210	1090	1080	35.0	35.0	85.0	85.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571552 -- Swatara Creek at Tremont, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT										
01...	1345	1028	1028	15	349	13	10.7	99	6.8	6.9
29...	0945	1028	89203	55	457	51	10.5	93	5.4	5.3
JAN										
05...	0930	1028	89203	40	490	21	10.4	82	5.7	5.8
MAR										
04...	0945	1028	89203	27	464	21	12.9	98	6.0	6.1
APR										
21...	0900	1028	89203	40	353	6.7	10.8	100	7.0	6.4
JUN										
03...	0900	1028	89203	24	301	5.4	9.3	93	7.0	6.7
JUL										
21...	0845	1028	89203	26	349	5.8	9.6	101	6.9	6.0
SEP										
08...	0845	1028	89203	13	373	4.0	9.4	98	7.4	6.6

Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recover-able, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recover-able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover-able, mg/L (00929)
OCT										
01...	268	11.9	16.1	15.8	12.7	12.5	1.60	1.60	7.00	6.90
29...	78.0	10.1	5.30	5.30	3.20	3.30	1.00	.900	2.60	2.60
JAN										
05...	97.0	5.20	6.50	6.80	3.80	4.00	.800	.800	2.60	3.20
MAR										
04...	103	3.80	6.90	6.90	4.10	4.10	.800	.800	3.30	3.60
APR										
21...	135	11.6	9.40	9.70	5.70	5.70	.900	.900	4.20	4.10
JUN										
03...	141	14.9	11.2	11.4	6.70	6.90	1.10	1.00	4.60	4.50
JUL										
21...	152	17.4	11.5	11.3	7.00	6.90	.800	.800	3.10	3.30
SEP										
08...	201	17.3	16.8	16.9	9.80	9.90	1.50	1.50	6.40	6.40

Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Acidity water, unfltrd heated, mg/L as CaCO3 (70508)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Silica, water, unfltrd, mg/L (00956)	Sulfate, water, fltrd, mg/L (00945)	Sulfate, water, unfltrd, mg/L (00946)	Nitrate, water, fltrd, mg/L as N (00618)	Nitrite, water, fltrd, mg/L as N (00613)
OCT										
01...	11.3	--	12.6	<.010	6.96	7.16	92.4	120	.010	<.030
29...	2.60	--	3.52	<.010	--	--	23.7	--	.120	<.030
JAN										
05...	2.90	--	5.39	<.010	--	--	29.0	--	.240	<.030
MAR										
04...	4.30	--	--	--	--	--	--	--	--	--
APR										
21...	5.70	--	7.01	--	--	--	41.6	--	--	--
JUN										
03...	5.30	--	10.0	--	--	--	46.4	--	--	--
JUL										
21...	3.60	--	5.25	--	--	--	45.3	--	.310	--
SEP										
08...	8.70	--	9.97	.040	--	--	63.0	--	1.19	<.030

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571552 -- Swatara Creek at Tremont, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Dysprosium, water, fltrd, µg/L (82331)	Dysprosium, water, unfltrd, µg/L (82330)	Erbium, water, fltrd, µg/L (50573)	Erbium, water, unfltrd, µg/L (01246)	Europium, water, fltrd, µg/L (50574)	Europium, water, unfltrd, µg/L (01236)	Gadolinium, water, fltrd, µg/L (50575)	Gadolinium, water, unfltrd, µg/L (01219)	Gallium, water, fltrd, µg/L (01120)	Gallium, water, unfltrd, µg/L (01122)
OCT 01...	.060	.220	.042	.140	.013	.039	.071	.190	<.020	.020
29...	--	--	--	--	--	--	--	--	--	--
JAN 05...	--	--	--	--	--	--	--	--	--	--
MAR 04...	--	--	--	--	--	--	--	--	--	--
APR 21...	--	--	--	--	--	--	--	--	--	--
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUL 21...	--	--	--	--	--	--	--	--	--	--
SEP 08...	--	--	--	--	--	--	--	--	--	--

Date	Germanium, water, fltrd, µg/L (01125)	Germanium, water, unfltrd, µg/L (01127)	Holmium, water, fltrd, µg/L (50577)	Holmium, water, unfltrd, µg/L (01247)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recoverable, µg/L (01045)	Lanthanum, water, fltrd, µg/L (01180)	Lanthanum, water, unfltrd, µg/L (01182)	Lead, water, fltrd, µg/L (01049)	Lead, water, unfltrd recoverable, µg/L (01051)
OCT 01...	<.020	<.020	.014	.047	555	1450	.440	.760	<.050	.450
29...	--	--	--	--	210	840	--	--	--	--
JAN 05...	--	--	--	--	170	550	--	--	--	--
MAR 04...	--	--	--	--	150	350	--	--	--	--
APR 21...	--	--	--	--	110	500	--	--	--	--
JUN 03...	--	--	--	--	60.0	230	--	--	--	--
JUL 21...	--	--	--	--	60.0	210	--	--	--	--
SEP 08...	--	--	--	--	20.0	100	--	--	--	--

Date	Lithium, water, fltrd, µg/L (01130)	Lithium, water, unfltrd recoverable, µg/L (01132)	Manganese, water, fltrd, µg/L (01056)	Manganese, water, unfltrd recoverable, µg/L (01055)	Molybdenum, water, fltrd, µg/L (01060)	Molybdenum, water, unfltrd recoverable, µg/L (01062)	Neodymium, water, fltrd, µg/L (50579)	Neodymium, water, unfltrd, µg/L (01237)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recoverable, µg/L (01067)
OCT 01...	15.0	14.5	884	893	.098	.072	.350	.800	32.0	29.0
29...	--	--	430	450	--	--	--	--	22.0	7.00
JAN 05...	--	--	450	480	--	--	--	--	17.0	19.0
MAR 04...	--	--	510	520	--	--	--	--	20.0	15.0
APR 21...	--	--	390	450	--	--	--	--	25.0	25.0
JUN 03...	--	--	500	520	--	--	--	--	25.0	30.0
JUL 21...	--	--	590	590	--	--	--	--	31.0	31.0
SEP 08...	--	--	500	510	--	--	--	--	25.0	25.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571552 -- Swatara Creek at Tremont, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)	Uranium natural water, unfltrd µg/L (28011)
OCT				
01...	66.0	72.0	.017	.063
29...	44.0	47.0	--	--
JAN				
05...	55.0	63.0	--	--
MAR				
04...	50.0	50.0	--	--
APR				
21...	60.0	100	--	--
JUN				
03...	55.0	60.0	--	--
JUL				
21...	34.0	36.0	--	--
SEP				
08...	60.0	60.0	--	--

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571774 -- Lorberry Creek, Site E2-0, at Lorberry, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1345	1028	89203	5.0	400	35	10.8	100	5.8	5.3
NOV 24...	1400	1028	89203	7.9	424	32	10.9	100	5.5	5.1
DEC 30...	1430	1028	89203	10	370	26	10.9	101	5.4	6.0
MAR 01...	1415	1028	89203	2.9	353	10	11.0	101	6.2	5.7
APR 20...	1315	1028	89203	--	355	28	10.8	102	5.9	5.8
JUN 02...	1345	1028	89203	8.1	218	15	10.6	99	7.0	6.5
JUL 19...	1445	1028	89203	4.3	262	11	10.8	100	5.9	5.9
SEP 13...	1400	1028	89203	2.4	246	15	10.9	104	6.4	6.3

Date	Specif. conductance, wat unfltrd, μ S/cm 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)
OCT 28...	294	11.7	12.1	12.6	24.3	24.2	1.30	1.30	4.00	4.20
NOV 24...	247	11.7	9.40	9.20	16.6	16.3	.900	.900	4.90	4.40
DEC 30...	251	11.2	9.90	9.60	18.3	17.8	1.20	1.10	2.80	3.10
MAR 01...	316	11.5	14.2	14.6	23.0	23.4	1.30	1.30	3.40	3.50
APR 20...	257	12.4	11.4	11.6	18.4	18.8	1.20	1.20	3.80	3.70
JUN 02...	252	12.6	10.3	10.4	20.2	20.4	1.10	1.20	3.30	3.30
JUL 19...	328	12.7	14.6	--	25.8	--	1.20	--	3.10	--
SEP 13...	310	12.9	16.7	16.7	25.6	25.6	1.30	1.30	3.50	3.50

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571774 -- Lorberry Creek, Site E2-0, at Lorberry, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfltrd recover- able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	2.50	3.50	<.010	127	.050	<.030	<.020	200	1200	.040
NOV 24...	1.80	3.38	<.010	100	.030	<.030	<.020	400	700	.100
DEC 30...	3.40	3.36	<.010	105	.010	<.030	<.020	400	700	.100
MAR 01...	2.90	3.69	--	134	--	--	--	200	800	--
APR 20...	5.00	3.65	--	105	--	--	--	<100	700	--
JUN 02...	10.8	3.45	--	104	--	--	--	<100	700	--
JUL 19...	4.50	3.24	--	135	.010	--	--	<100	--	--
SEP 13...	4.80	3.37	.010	136	.050	<.030	<.020	<100	800	.060

Date	Iron, water, unfltrd, recover- able, µg/L (01046)	Iron, water, unfltrd recover able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover able, µg/L (01092)
OCT 28...	4110	6170	1560	1580	76.0	81.0	159	164
NOV 24...	2330	3740	1470	1450	63.0	64.0	200	168
DEC 30...	2510	4020	1540	1510	70.0	68.0	195	189
MAR 01...	4030	4990	1900	1900	70.0	70.0	175	180
APR 20...	3690	5300	1390	1400	70.0	75.0	195	205
JUN 02...	6010	6790	1640	1630	55.0	55.0	110	110
JUL 19...	4020	--	1760	--	81.0	--	101	--
SEP 13...	5120	6350	2050	2030	75.0	75.0	180	185

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571776 -- Stumps Run at Lorberry, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1330	1028	89203	4.9	391	5.0	10.9	99	6.0	6.1
NOV 24...	1345	1028	89203	2.3	400	1.0	11.4	99	6.0	6.2
DEC 30...	1415	1028	89203	2.9	327	.0	12.4	97	6.4	5.1
MAR 01...	1400	1028	89203	.56	116	2.0	99.6	42	12.7	6.1
APR 20...	1300	1028	89203	1.1	372	4.0	10.6	101	6.0	6.2
JUN 02...	1330	1028	89203	.44	366	4.0	9.6	96	6.5	6.2
JUL 19...	1430	1028	89203	.22	352	3.5	9.5	97	6.2	3.9
SEP 13...	1345	1028	89203	.14	365	1.0	9.6	98	6.0	6.1

Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover-able, mg/L (00929)
OCT 28...	42.0	11.1	3.40	3.40	1.90	1.90	.900	.900	.600	.600
NOV 24...	45.0	9.50	3.00	2.90	2.00	1.90	.500	.400	2.80	1.30
DEC 30...	46.0	5.00	3.40	3.20	2.40	2.20	.600	.500	.800	.100
MAR 01...	5.10	.600	3.30	3.20	2.20	2.20	.500	.500	.700	.900
APR 20...	44.0	13.1	3.40	3.40	2.10	2.10	.600	.600	.900	.800
JUN 02...	42.0	15.4	3.20	3.40	2.10	2.20	.600	.600	.600	.700
JUL 19...	43.0	16.3	3.20	15.3	1.90	27.3	.400	1.20	.600	3.50
SEP 13...	36.0	16.3	2.70	2.70	1.70	1.70	.500	.400	.900	.700

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571776 -- Stumps Run at Lorberry, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfiltered recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 28...	3.20	.720	<.010	15.0	.010	<.030	<.020	<100	<100	.040
NOV 24...	3.30	.570	<.010	16.2	.030	<.030	<.020	<100	<100	.040
DEC 30...	2.20	.500	<.010	15.4	.030	<.030	<.020	<100	<100	.030
MAR 01...	4.70	.490	--	15.1	--	--	--	<100	<100	--
APR 20...	2.90	.610	--	14.4	--	--	--	<100	<100	--
JUN 02...	4.30	.730	--	14.2	--	--	--	<100	<100	--
JUL 19...	4.00	.670	--	13.6	.050	--	--	<100	1000	--
SEP 13...	4.90	.990	<.010	9.26	.080	<.030	<.020	<100	<100	.020

Date	Iron, water, unfiltered recover- able, µg/L (01046)	Iron, water, unfiltered recover- able, µg/L (01045)	Mangan- ese, water, unfiltered recover- able, µg/L (01056)	Mangan- ese, water, unfiltered recover- able, µg/L (01055)	Nickel, water, unfiltered recover- able, µg/L (01065)	Nickel, water, unfiltered recover- able, µg/L (01067)	Zinc, water, unfiltered recover- able, µg/L (01090)	Zinc, water, unfiltered recover- able, µg/L (01092)
OCT 28...	130	110	80.0	90.0	35.0	6.00	25.0	27.0
NOV 24...	30.0	50.0	40.0	50.0	7.00	6.00	71.0	32.0
DEC 30...	50.0	50.0	60.0	50.0	7.00	6.00	29.0	26.0
MAR 01...	<10.0	60.0	50.0	40.0	10.0	<5.00	25.0	20.0
APR 20...	80.0	130	30.0	50.0	<5.00	<5.00	25.0	25.0
JUN 02...	80.0	140	40.0	60.0	<5.00	10.0	20.0	20.0
JUL 19...	50.0	4970	30.0	1890	<5.00	86.0	9.00	111
SEP 13...	60.0	100	20.0	30.0	<5.00	<5.00	25.0	25.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177610 -- Lorberry Creek Wetlands Inflow at Lorberry, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1325	1028	89203	1.9	418	42	10.7	99	5.4	5.3
NOV 24...	1330	1028	89203	1.3	428	58	10.4	95	5.4	5.0
DEC 30...	1405	1028	89203	.85	396	26	9.8	90	5.4	5.2
MAR 01...	1350	1028	89203	.90	266	19	10.1	94	8.2	5.5
APR 20...	1250	1028	89203	.94	385	25	10.5	99	5.5	5.5
JUN 02...	1320	1028	89203	.86	332	12	10.4	97	6.2	6.0
JUL 19...	1420	1028	89203	.78	337	11	10.5	99	5.9	5.8
SEP 13...	1330	1028	89203	.78	355	12	10.5	100	5.7	5.7

Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover-able, mg/L (00929)
OCT 28...	338	12.0	14.0	14.0	29.0	28.9	1.20	1.30	3.80	3.80
NOV 24...	259	11.8	9.70	9.50	17.5	16.6	1.00	.900	3.70	4.10
DEC 30...	263	11.6	10.4	10.3	19.6	19.1	1.20	1.20	3.60	3.30
MAR 01...	367	12.1	14.9	14.8	24.6	24.4	1.30	1.30	2.80	3.60
APR 20...	267	12.9	11.6	12.1	18.8	19.3	1.20	1.20	3.70	3.50
JUN 02...	261	12.3	10.3	11.0	20.8	21.1	1.20	1.20	3.10	3.20
JUL 19...	340	12.5	15.0	3.30	27.1	2.00	1.30	.500	3.40	.600
SEP 13...	320	12.7	16.6	17.5	25.5	26.6	1.30	1.30	3.90	3.50

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177610 -- Lorberry Creek Wetlands Inflow at Lorberry, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phosphate, water, fltrd, mg/L as P (00671)	Aluminum, water, fltrd, mg/L (01106)	Aluminum, unfiltered water, recoverable, mg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 28...	5.00	3.24	<.010	151	<.010	<.030	<.020	700	1400	.050
NOV 24...	2.40	3.43	<.010	105	<.010	<.030	<.020	600	800	.070
DEC 30...	3.30	3.40	<.010	109	.020	<.030	<.020	600	800	.100
MAR 01...	3.70	3.06	--	141	--	--	--	400	800	--
APR 20...	.800	3.62	--	108	--	--	--	400	800	--
JUN 02...	11.4	3.45	--	107	--	--	--	200	700	--
JUL 19...	6.00	3.19	--	139	<.010	--	--	200	<100	--
SEP 13...	5.70	3.37	<.010	140	.070	<.030	<.020	200	800	.050

Date	Iron, water, fltrd, mg/L (01046)	Iron, water, unfiltered recoverable, mg/L (01045)	Manganese, water, fltrd, mg/L (01056)	Manganese, water, unfiltered recoverable, mg/L (01055)	Nickel, water, fltrd, mg/L (01065)	Nickel, water, unfiltered recoverable, mg/L (01067)	Zinc, water, fltrd, mg/L (01090)	Zinc, water, unfiltered recoverable, mg/L (01092)
OCT 28...	5210	6910	1930	1950	93.0	77.0	194	197
NOV 24...	2560	3920	1590	1530	68.0	65.0	229	185
DEC 30...	2760	4410	1670	1620	77.0	73.0	211	202
MAR 01...	4520	5390	2060	2040	75.0	75.0	190	185
APR 20...	3860	5470	1490	1480	75.0	75.0	205	210
JUN 02...	6550	7300	1710	1750	60.0	60.0	115	115
JUL 19...	4340	90.0	1920	50.0	85.0	<5.00	109	11.0
SEP 13...	5370	6650	2090	2160	75.0	80.0	185	195

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177614 -- Lorberry Cr Wetlands Cell 2 Outflow at Lorberry,PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1315	1028	89203	1.4	400	21	10.7	104	5.5	5.4
NOV 24...	1315	1028	89203	1.1	414	20	12.3	112	5.6	5.6
DEC 30...	1355	1028	89203	1.2	397	16	11.1	97	5.8	5.7
MAR 01...	1340	1028	89203	1.5	367	1.0	10.8	103	7.3	7.3
APR 20...	1240	1028	89203	1.2	387	8.0	10.2	109	5.9	5.9
JUN 02...	1310	1028	89203	.95	256	6.8	9.4	110	6.5	6.6
JUL 19...	1410	1028	89203	1.2	372	13	9.8	106	5.8	5.9
SEP 13...	1310	1028	89203	1.3	384	1.0	10.1	113	5.4	5.4

Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 28...	338	14.3	13.9	13.8	28.7	28.6	1.20	1.40	3.50	3.60
NOV 24...	258	11.3	11.1	10.5	17.3	16.5	.900	.900	4.90	3.40
DEC 30...	257	9.50	11.7	11.3	19.2	18.7	1.20	1.20	3.50	3.10
MAR 01...	350	13.0	26.9	27.2	23.0	23.4	1.30	1.30	3.00	2.90
APR 20...	266	18.8	12.5	12.7	18.5	19.0	1.20	1.20	3.70	3.70
JUN 02...	262	22.7	12.0	12.0	20.6	20.4	1.10	1.10	3.00	3.20
JUL 19...	340	19.5	14.5	15.7	27.1	28.1	1.20	1.30	3.20	3.40
SEP 13...	319	20.9	17.0	17.8	25.4	26.5	1.30	1.30	3.90	4.10

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177614 -- Lorberry Cr Wetlands Cell 2 Outflow at Lorberry,PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfltrd recover- able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	3.20	3.14	<.010	151	<.010	<.030	<.020	300	1000	.060
NOV 24...	3.00	3.39	<.010	106	<.010	<.030	<.020	200	500	.060
DEC 30...	3.50	3.36	<.010	107	.020	<.030	<.020	<100	500	.100
MAR 01...	21.1	3.11	--	140	--	--	--	200	200	--
APR 20...	4.40	3.75	--	108	--	--	--	<100	300	--
JUN 02...	12.0	3.42	--	107	--	--	--	<100	300	--
JUL 19...	4.50	3.29	--	136	.010	--	--	<100	1100	--
SEP 13...	2.50	3.37	<.010	134	.040	<.030	<.020	<100	<100	.050

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)	
OCT 28...		4060	5300	1850	1860	85.0	80.0	201	196
NOV 24...		1650	2740	1580	1500	70.0	64.0	227	189
DEC 30...		1640	3120	1640	1590	75.0	73.0	222	215
MAR 01...		50.0	500	1290	1340	25.0	30.0	10.0	25.0
APR 20...		1990	2550	1430	1420	75.0	80.0	225	230
JUN 02...		3490	4190	1700	1680	60.0	55.0	110	120
JUL 19...		1740	5150	1790	1990	77.0	89.0	89.0	114
SEP 13...		430	580	1890	1940	75.0	80.0	180	195

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177618 -- Lorberry Cr Wetlands Cell 4 Outflow at Lorberry, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1305	1028	89203	2.5	385	4.0	10.5	104	5.8	5.7
NOV 24...	1300	1028	89203	2.3	407	20	12.2	111	5.7	5.6
DEC 30...	1345	1028	89203	2.1	405	6.0	11.3	97	5.8	6.0
MAR 01...	1330	1028	89203	2.0	367	.0	11.1	106	6.6	6.9
APR 20...	1230	1028	89203	2.0	324	2.0	9.9	110	6.2	5.9
JUN 02...	1300	1028	89203	1.9	268	7.0	8.3	101	6.6	6.7
JUL 19...	1400	1028	89203	1.9	354	.0	9.7	109	6.0	6.0
SEP 13...	1300	1028	89203	1.7	369	.0	9.5	110	5.8	5.8

Date	Specif. conductance, wat unfltrd, μ S/cm, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 28...	318	14.9	13.6	13.3	27.8	28.4	1.30	1.20	3.50	3.60
NOV 24...	252	11.1	10.7	10.9	16.6	16.8	.900	.900	3.60	3.50
DEC 30...	254	8.30	11.8	11.0	19.2	18.1	1.20	1.10	3.50	3.30
MAR 01...	353	13.0	26.5	26.8	22.6	22.7	1.30	1.30	3.20	3.40
APR 20...	263	20.5	12.4	12.9	18.4	19.0	1.20	1.20	3.70	3.80
JUN 02...	258	25.4	12.3	12.4	20.4	20.8	1.10	1.10	3.00	2.90
JUL 19...	338	21.0	13.6	15.1	27.3	28.4	1.20	1.20	3.20	3.40
SEP 13...	315	22.4	16.8	17.2	25.1	26.1	1.30	1.30	3.90	3.70

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177618 -- Lorberry Cr Wetlands Cell 4 Outflow at Lorberry, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered, end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, mg/L (01106)	Alum- inum, water, unfltrd recover- able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	4.30	3.12	<.010	141	<.010	<.030	<.020	<100	200	.050
NOV 24...	2.70	3.36	<.010	104	.020	<.030	<.020	<100	300	.070
DEC 30...	3.60	3.33	<.010	105	.020	<.030	<.020	<100	200	.080
MAR 01...	20.4	3.03	--	138	--	--	--	<100	200	--
APR 20...	3.00	3.59	--	107	--	--	--	<100	<100	--
JUN 02...	16.0	3.37	--	108	--	--	--	<100	<100	--
JUL 19...	2.90	3.31	--	134	<.010	--	--	<100	200	--
SEP 13...	3.60	3.42	<.010	130	.060	<.030	<.020	<100	<100	.020

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Iron, water, unfltrd recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)
OCT 28...		2320	2730	1790	1840	98.0	79.0	189	191
NOV 24...		1100	1600	1510	1520	68.0	68.0	244	187
DEC 30...		1130	1830	1600	1530	74.0	70.0	231	220
MAR 01...		70.0	110	1250	1260	25.0	30.0	10.0	15.0
APR 20...		1400	1680	1410	1430	75.0	80.0	225	240
JUN 02...		790	1100	1580	1640	55.0	55.0	90.0	95.0
JUL 19...		480	2030	1700	1890	71.0	85.0	91.0	102
SEP 13...		100	100	1450	1430	75.0	75.0	175	185

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177620 -- Lorberry Creek below Wetlands at Lorberry, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency col- lecting sample, code (00027)	Agency ana- lyzing sample, code (00028)	Instan- taneous dis- charge, cfs (00061)	Oxi- da- tion re- duc- tion poten- tial, mV (00090)	Tur- bi- dity, water, unfltrd field, NTU (61028)	Dis- solved oxygen, mg/L (00300)	Dis- solved oxygen, percent of sat- uration (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1230	1028	89203	9.9	332	16	10.7	100	5.8	5.6
NOV 24...	1200	1028	89203	10	362	23	10.9	99	5.5	5.3
DEC 30...	1330	1028	89203	14	383	21	10.9	98	5.4	5.3
MAR 01...	1245	1028	89203	4.5	317	6.0	11.1	101	5.9	6.2
APR 20...	1130	1028	89203	11	335	19	10.6	100	6.0	5.8
JUN 02...	1200	1028	89203	4.7	209	8.0	9.9	99	7.0	6.8
JUL 19...	1300	1028	89203	5.3	259	7.7	10.5	101	6.2	6.3
SEP 13...	1215	1028	89203	4.3	253	7.0	10.4	102	6.2	6.1

Date	Specif. conduc- tance, wat unfl µS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover- able, mg/L (00916)	Magnes- ium, water, fltrd, mg/L (00925)	Magnes- ium, water, unfltrd recover- able, mg/L (00927)	Potas- sium, water, fltrd, mg/L (00935)	Potas- sium, water, unfltrd recover- able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover- able, mg/L (00929)
OCT 28...	259	12.3	12.2	10.7	21.3	20.3	1.20	1.20	3.60	3.30
NOV 24...	237	11.3	11.8	9.00	16.0	14.9	.900	.900	4.20	2.80
DEC 30...	236	10.3	9.40	9.20	16.9	16.7	1.10	1.10	2.60	2.80
MAR 01...	301	11.1	13.5	14.5	19.9	20.1	1.20	1.20	3.20	3.30
APR 20...	246	13.3	10.9	11.0	16.9	17.0	1.10	1.10	3.50	3.50
JUN 02...	237	15.4	10.4	10.0	18.6	18.3	1.10	1.10	2.90	2.80
JUL 19...	316	14.8	14.1	14.6	24.5	28.3	1.20	1.20	3.20	3.30
SEP 13...	303	14.5	15.7	15.9	24.0	24.4	1.30	1.20	3.90	3.80

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177620 -- Lorberry Creek below Wetlands at Lorberry, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfiltered recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 28...	3.10	2.97	<.010	107	.030	<.030	<.020	200	800	.040
NOV 24...	2.50	3.14	<.010	94.9	.010	<.030	<.020	400	600	.060
DEC 30...	2.20	3.29	<.010	113	.030	<.030	<.020	400	600	.080
MAR 01...	5.40	3.17	--	119	--	--	--	<100	600	--
APR 20...	2.60	3.44	--	98.9	--	--	--	<100	600	--
JUN 02...	15.0	3.27	--	95.3	--	--	--	<100	600	--
JUL 19...	4.70	3.11	--	125	.040	--	--	<100	<100	--
SEP 13...	5.20	3.24	.010	131	.070	<.030	<.020	<100	600	.040

Date	Iron, water, unfiltered recover- able, µg/L (01046)	Iron, water, unfiltered recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered recover- able, µg/L (01092)
OCT 28...	5020	4120	1380	1290	79.0	55.0	138	136
NOV 24...	5440	3220	1450	1320	62.0	64.0	232	177
DEC 30...	2390	3830	1390	1370	65.0	62.0	179	178
MAR 01...	3110	3480	1570	1550	55.0	55.0	140	130
APR 20...	3490	4700	1270	1270	70.0	65.0	190	185
JUN 02...	5780	6120	1500	1480	50.0	50.0	100	100
JUL 19...	3640	390	1650	1740	74.0	78.0	88.0	90.0
SEP 13...	4280	4970	1900	1900	70.0	75.0	170	185

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

403521076260601 -- Shadle Mine Shaft at Lorberry, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency col- lecting sample, code (00027)	Agency ana- lyzing sample, code (00028)	Instan- taneous dis- charge, cfs (00061)	Oxi- da- tion re- duc- tion poten- tial, mV (00090)	Tur- bi- dity, water, unfltrd field, NTU (61028)	Dis- solved oxy- gen, mg/L (00300)	Dis- solved oxy- gen, per- cent of sat- ura- tion (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1215	1028	89203	.01	310	.0	.5	4	4.3	4.4
NOV 24...	1145	1028	89203	.01	317	.0	.7	7	4.2	4.1
DEC 30...	1315	1028	89203	.01	342	.0	.7	7	4.3	4.5
MAR 01...	1230	1028	89203	.00	355	7.0	1.6	15	4.2	4.4
APR 20...	1115	1028	89203	.01	290	1.0	.8	7	4.6	4.6
JUN 02...	1130	1028	89203	.01	307	1.8	.9	9	4.5	4.4
JUL 19...	1245	1028	89203	.00	245	.0	.9	8	4.6	4.9
SEP 13...	1145	1028	89203	.00	259	3.0	1.0	9	4.5	4.5

Date	Specif. conduc- tance, wat un- f 25 degC (00095)	Temper- ature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover- able, mg/L (00916)	Magnes- ium, water, fltrd, mg/L (00925)	Magnes- ium, water, unfltrd recover- able, mg/L (00927)	Potas- sium, water, fltrd, mg/L (00935)	Potas- sium, water, unfltrd recover- able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover- able, mg/L (00929)
OCT 28...	1960	12.5	232	225	77.6	79.9	4.10	4.20	2.20	2.30
NOV 24...	1900	12.5	215	195	73.7	66.5	4.60	4.10	3.30	2.90
DEC 30...	1870	12.3	215	213	69.5	69.7	5.00	4.90	2.30	2.10
MAR 01...	1690	12.2	185	188	56.7	58.2	4.90	5.00	1.90	2.00
APR 20...	1870	12.2	225	229	64.8	68.1	5.40	5.50	2.30	2.60
JUN 02...	1560	12.3	205	203	58.1	57.1	5.60	5.60	2.10	2.10
JUL 19...	1610	12.5	220	13.8	59.7	24.4	5.40	1.10	2.10	3.10
SEP 13...	1070	12.4	210	218	52.6	54.0	5.50	5.70	2.00	2.20

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

403521076260601 -- Shadle Mine Shaft at Lorberry, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Aluminum, water, fltrd, µg/L (01106)	Aluminum, unfiltered recoverable, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 28...	.000	1.66	<1.00	1300	<1.00	<3.00	<2.00	4000	4000	<1.00
NOV 24...	.000	1.02	<.050	1240	<.050	<.150	<.100	4300	3700	.100
DEC 30...	.400	1.21	<.050	1240	<.050	<.150	<.100	4100	4100	.130
MAR 01...	.000	.995	--	1040	--	--	--	4600	4600	--
APR 20...	2.20	2.09	--	1240	--	--	--	2800	2900	--
JUN 02...	.000	1.58	--	1080	--	--	--	4400	4400	--
JUL 19...	4.30	1.09	--	991	<.040	--	--	3300	800	--
SEP 13...	.700	.955	<.040	990	.065	<.120	<.080	3700	4000	.115

Date	Iron, water, unfiltered recoverable, µg/L (01046)	Iron, water, unfiltered recoverable, µg/L (01045)	Manganese, water, unfiltered recoverable, µg/L (01056)	Manganese, water, unfiltered recoverable, µg/L (01055)	Nickel, water, unfiltered recoverable, µg/L (01065)	Nickel, water, unfiltered recoverable, µg/L (01067)	Zinc, water, unfiltered recoverable, µg/L (01090)	Zinc, water, unfiltered recoverable, µg/L (01092)
OCT 28...	251000	244000	10200	9920	<5.00	<5.00	224	229
NOV 24...	224000	205000	9630	8920	150	136	313	254
DEC 30...	204000	204000	8860	8790	129	127	216	214
MAR 01...	167000	171000	8310	8510	145	145	245	250
APR 20...	189000	197000	8070	8260	125	130	215	220
JUN 02...	157000	157000	6830	6780	135	135	220	215
JUL 19...	154000	3750	7270	1670	132	74.0	108	92.0
SEP 13...	165000	182000	7000	7130	135	140	240	255

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571777 -- Lorberry Cr ab Panther Head Disch nr Lorberry Jct, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1130	1028	89203	13	433	18	11.0	100	5.1	5.2
NOV 24...	1100	1028	89203	13	435	25	11.0	99	5.1	5.2
DEC 30...	1230	1028	89203	16	348	19	11.0	97	5.0	5.2
MAR 01...	1145	1028	89203	6.3	386	7.0	11.6	101	6.2	6.3
APR 20...	1030	1028	89203	13	352	23	11.0	100	6.2	5.6
JUN 02...	1045	1028	89203	6.3	212	9.3	10.4	99	7.2	6.5
JUL 19...	1200	1028	89203	4.0	330	16	10.6	101	6.2	5.9
SEP 13...	1100	1028	89203	4.3	257	9.0	10.4	101	6.6	6.0

Date	Specif. conductance, wat unfltrd, μ S/cm 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 28...	222	11.1	11.1	11.2	16.2	16.4	1.10	1.10	2.90	2.90
NOV 24...	225	10.9	10.0	9.20	15.2	14.1	.900	.800	4.10	3.70
DEC 30...	227	9.80	9.60	9.50	15.7	15.4	1.10	1.00	3.00	2.40
MAR 01...	277	9.20	15.2	15.1	18.6	18.6	1.10	1.10	3.20	3.10
APR 20...	231	12.1	11.0	10.9	15.7	15.6	1.10	1.10	3.20	3.20
JUN 02...	220	13.0	10.5	10.4	16.7	16.7	1.00	1.00	2.70	2.70
JUL 19...	273	13.8	14.0	6.20	21.3	6.20	1.10	.700	3.00	.900
SEP 13...	275	13.6	16.1	16.4	22.4	23.1	1.20	1.20	3.60	3.40

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571777 -- Lorberry Cr ab Panther Head Disch nr Lorberry Jct, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfltrd recover- able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	2.00	2.69	<.010	93.1	.100	<.030	<.020	300	800	.050
NOV 24...	2.60	2.90	<.010	90.8	.040	<.030	<.020	300	700	.070
DEC 30...	2.20	3.06	<.010	93.4	.020	<.030	<.020	300	600	.100
MAR 01...	4.50	3.57	--	113	--	--	--	<100	600	--
APR 20...	2.10	3.42	--	95.8	--	--	--	<100	700	--
JUN 02...	8.50	3.15	--	92.5	--	--	--	<100	600	--
JUL 19...	3.20	3.25	--	114	.060	--	--	<100	3600	--
SEP 13...	3.80	3.45	<.010	126	.070	<.030	<.020	<100	700	.050

Date	Iron, water, unfltrd recover- able, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)
OCT 28...	2560	5170	1070	1080	45.0	37.0	111	112
NOV 24...	2130	3220	1360	1260	55.0	53.0	240	165
DEC 30...	2010	3350	1310	1290	62.0	60.0	173	167
MAR 01...	2300	3140	1460	1470	50.0	50.0	115	120
APR 20...	2730	4170	1170	1170	65.0	65.0	175	180
JUN 02...	3670	4460	1350	1350	50.0	50.0	100	100
JUL 19...	2510	450	1470	1240	67.0	137	79.0	195
SEP 13...	3690	4870	1800	1830	70.0	70.0	165	170

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177780 -- Panther Head Disch to Lorberry Cr nr Lorberry Jct, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency col- lecting sample, code (00027)	Agency ana- lyzing sample, code (00028)	Instan- taneous dis- charge, cfs (00061)	Oxi- da- tion re- duc- tion poten- tial, mV (00090)	Tur- bi- dity, water, unfltrd field, NTU (61028)	Dis- solved oxygen, mg/L (00300)	Dis- solved oxygen, percent of sat- uration (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1145	1028	89203	.67	526	.0	9.5	86	3.4	3.6
NOV 24...	1115	1028	89203	.22	529	.0	9.3	82	3.4	3.2
DEC 30...	1245	1028	89203	.11	371	.0	10.5	87	3.4	3.6
MAR 01...	1200	1028	89203	.04	510	.0	11.1	86	4.4	3.8
APR 20...	1045	1028	89203	.33	642	.0	10.5	92	3.9	3.5
JUN 02...	1100	1028	89203	.67	607	.3	7.5	70	3.5	3.5
JUL 19...	1215	1028	89203	.14	521	.0	8.0	78	3.5	3.4
SEP 13...	1115	1028	89203	.01	587	.0	4.9	49	3.4	3.5

Date	Specif. conduc- tance, wat unfl µS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover- able, mg/L (00916)	Magnes- ium, water, fltrd, mg/L (00925)	Magnes- ium, water, unfltrd recover- able, mg/L (00927)	Potas- sium, water, fltrd, mg/L (00935)	Potas- sium, water, unfltrd recover- able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover- able, mg/L (00929)
OCT 28...	288	10.6	5.10	5.00	4.60	4.60	.900	.800	.800	.900
NOV 24...	315	9.80	6.20	5.90	6.20	6.00	.700	.700	3.60	2.30
DEC 30...	328	7.20	7.00	7.10	7.10	7.20	.900	.900	.500	.700
MAR 01...	197	4.60	4.40	4.40	4.20	4.20	.600	.700	.700	1.00
APR 20...	304	9.40	6.50	6.60	6.40	6.40	.800	.800	1.20	1.20
JUN 02...	269	12.4	6.80	6.80	6.80	6.90	.800	.800	1.00	1.00
JUL 19...	303	13.9	6.10	.700	6.30	.400	.700	.300	1.00	.600
SEP 13...	308	15.3	9.60	9.80	8.70	8.90	.900	.900	1.20	1.50

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177780 -- Panther Head Disch to Lorberry Cr nr Lorberry Jct, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfiltered water, recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 28...	.000	1.16	<.010	63.9	.010	<.030	<.020	2600	2700	.040
NOV 24...	.000	1.03	<.010	82.1	<.010	<.030	<.020	3200	3000	.100
DEC 30...	.000	.940	<.010	89.7	.010	<.030	<.020	3400	3400	.070
MAR 01...	.000	1.00	--	51.7	--	--	--	2100	2100	--
APR 20...	.000	.970	--	82.1	--	--	--	3000	3000	--
JUN 02...	.000	.990	--	87.1	--	--	--	4500	4600	--
JUL 19...	.000	.910	--	73.4	.010	--	--	3800	200	--
SEP 13...	.000	1.28	<.010	99.1	.050	<.030	<.020	4200	4200	.050

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered recover- able, µg/L (01092)
OCT 28...	580	700	900	890	99.0	88.0	232	232
NOV 24...	770	680	1180	1120	127	121	405	326
DEC 30...	700	710	1280	1290	139	140	371	375
MAR 01...	270	300	850	850	75.0	75.0	200	200
APR 20...	610	610	930	940	125	125	335	340
JUN 02...	730	710	1230	1250	140	140	350	355
JUL 19...	470	340	1250	40.0	136	<5.00	181	6.00
SEP 13...	1290	1350	1970	2000	170	170	435	445

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177790 -- Unnamed Trib to Lorberry Cr nr Lorberry Jct, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dis-solved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1200	1028	89203	9.0	468	3.0	11.4	99	4.5	4.8
NOV 24...	1130	1028	89203	5.7	433	1.0	11.4	96	4.7	4.9
DEC 30...	1300	1028	89203	6.9	357	1.0	13.2	98	4.8	5.1
MAR 01...	1215	1028	89203	.08	478	.0	13.9	100	5.2	5.4
APR 20...	1100	1028	89203	7.4	488	6.0	10.8	98	5.0	5.1
JUN 02...	1115	1028	89203	1.7	475	5.9	9.6	93	5.3	5.2
JUL 19...	1230	1028	89203	4.1	435	4.3	9.3	96	5.0	5.0
SEP 13...	1130	1028	89203	16	427	7.0	9.2	94	5.3	5.0

Date	Specif. conductance, wat unfltrd, μ S/cm 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recover-able, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recover-able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover-able, mg/L (00929)
OCT 28...	25.0	9.10	1.00	.900	.600	.600	.600	.600	.700	.700
NOV 24...	20.0	8.00	.700	.700	.500	.500	.300	.300	.500	<.100
DEC 30...	20.0	3.20	.900	.800	.500	.500	.400	.300	.500	.200
MAR 01...	16.0	1.70	.800	.800	.500	.500	.400	.400	.800	.600
APR 20...	16.0	11.0	1.00	.900	.600	.600	.400	.400	.700	.800
JUN 02...	15.0	14.0	.800	.800	.500	.500	.300	.300	.600	.500
JUL 19...	17.0	16.6	.700	224	.400	58.7	.300	5.10	.500	1.90
SEP 13...	16.0	16.0	1.00	1.00	.500	.500	.400	.400	.900	1.20

Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Acidity water, unfltrd, mg/L as CaCO3 (70508)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Silica, water, unfltrd, mg/L (00956)	Sulfate water, fltrd, mg/L (00945)	Sulfate water, unfltrd, mg/L (00946)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)
OCT 28...	2.00	--	1.14	<.010	--	--	4.30	--	<.010	<.030
NOV 24...	1.10	--	.970	<.010	--	--	4.25	--	.010	<.030
DEC 30...	1.70	--	.900	<.010	--	--	5.11	--	.030	<.030
MAR 01...	2.10	--	1.02	--	--	--	3.45	--	--	--
APR 20...	1.70	--	.920	--	--	--	3.94	--	--	--
JUN 02...	2.00	--	1.01	--	--	--	2.55	--	--	--
JUL 19...	1.10	--	.880	--	--	--	2.21	--	.020	--
SEP 13...	1.00	--	1.74	.010	--	--	1.62	--	.100	.030

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177790 -- Unnamed Trib to Lorberry Cr nr Lorberry Jct, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Dysprosium, water, fltrd, µg/L (82331)	Dysprosium, water, unfltrd, µg/L (82330)	Erbium, water, fltrd, µg/L (50573)	Erbium, water, unfltrd, µg/L (01246)	Europium, water, fltrd, µg/L (50574)	Europium, water, unfltrd, µg/L (01236)	Gadolinium, water, fltrd, µg/L (50575)	Gadolinium, water, unfltrd, µg/L (01219)	Gallium, water, fltrd, µg/L (01120)	Gallium, water, unfltrd, µg/L (01122)
OCT 28...	--	--	--	--	--	--	--	--	--	--
NOV 24...	--	--	--	--	--	--	--	--	--	--
DEC 30...	--	--	--	--	--	--	--	--	--	--
MAR 01...	--	--	--	--	--	--	--	--	--	--
APR 20...	--	--	--	--	--	--	--	--	--	--
JUN 02...	--	--	--	--	--	--	--	--	--	--
JUL 19...	--	--	--	--	--	--	--	--	--	--
SEP 13...	--	--	--	--	--	--	--	--	--	--

Date	Germanium, water, fltrd, µg/L (01125)	Germanium, water, unfltrd, µg/L (01127)	Holmium, water, fltrd, µg/L (50577)	Holmium, water, unfltrd, µg/L (01247)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd, recoverable, µg/L (01045)	Lanthanum, water, fltrd, µg/L (01180)	Lanthanum, water, unfltrd, µg/L (01182)	Lead, water, fltrd, µg/L (01049)	Lead, water, unfltrd, recoverable, µg/L (01051)
OCT 28...	--	--	--	--	210	420	--	--	--	--
NOV 24...	--	--	--	--	130	120	--	--	--	--
DEC 30...	--	--	--	--	80.0	90.0	--	--	--	--
MAR 01...	--	--	--	--	130	110	--	--	--	--
APR 20...	--	--	--	--	120	190	--	--	--	--
JUN 02...	--	--	--	--	320	360	--	--	--	--
JUL 19...	--	--	--	--	280	154000	--	--	--	--
SEP 13...	--	--	--	--	540	640	--	--	--	--

Date	Lithium, water, fltrd, µg/L (01130)	Lithium, water, unfltrd, recoverable, µg/L (01132)	Manganese, water, fltrd, µg/L (01056)	Manganese, water, unfltrd, recoverable, µg/L (01055)	Molybdenum, water, fltrd, µg/L (01060)	Molybdenum, water, unfltrd, recoverable, µg/L (01062)	Neodymium, water, fltrd, µg/L (50579)	Neodymium, water, unfltrd, µg/L (01237)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd, recoverable, µg/L (01067)
OCT 28...	--	--	80.0	70.0	--	--	--	--	6.00	<5.00
NOV 24...	--	--	40.0	40.0	--	--	--	--	<5.00	<5.00
DEC 30...	--	--	40.0	40.0	--	--	--	--	<5.00	<5.00
MAR 01...	--	--	30.0	30.0	--	--	--	--	<5.00	<5.00
APR 20...	--	--	30.0	30.0	--	--	--	--	<5.00	<5.00
JUN 02...	--	--	40.0	40.0	--	--	--	--	<5.00	<5.00
JUL 19...	--	--	40.0	7300	--	--	--	--	<5.00	134
SEP 13...	--	--	40.0	40.0	--	--	--	--	<5.00	<5.00

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

0157177790 -- Unnamed Trib to Lorberry Cr nr Lorberry Jct, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)	Uranium natural water unfltrd µg/L (28011)
OCT 28...	17.0	14.0	--	--
NOV 24...	61.0	19.0	--	--
DEC 30...	14.0	12.0	--	--
MAR 01...	10.0	10.0	--	--
APR 20...	15.0	15.0	--	--
JUN 02...	15.0	15.0	--	--
JUL 19...	25.0	118	--	--
SEP 13...	30.0	20.0	--	--

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571780 -- Lorberry Creek at Lorberry Junction, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT										
01...	1230	1028	1028	18	447	21	10.9	101	6.0	5.7
28...	0915	1028	89203	33	420	13	11.4	100	5.6	5.3
NOV										
24...	1000	1028	89203	22	391	20	11.2	100	5.6	5.3
DEC										
30...	1030	1028	89203	26	383	15	10.1	99	5.6	5.3
MAR										
01...	0945	1028	89203	7.3	388	8.0	12.5	100	6.2	6.3
APR										
20...	0930	1028	89203	29	353	20	11.1	101	6.4	5.8
JUN										
02...	0915	1028	89203	9.2	270	11	10.6	100	7.0	6.3
JUL										
19...	0945	1028	89203	9.5	306	11	10.4	100	6.5	5.5
SEP										
13...	0945	1028	89203	5.8	264	11	10.4	100	6.6	6.2

Date	Specif. conductance, wat unfltrd, μ S/cm 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT										
01...	200	11.9	8.25	8.40	12.2	12.0	.875	.875	2.50	2.55
28...	147	9.70	7.70	7.50	9.50	9.00	.900	.900	3.00	2.90
NOV										
24...	180	10.2	8.20	7.80	11.5	10.8	.800	.700	3.90	3.60
DEC										
30...	177	8.30	8.10	8.20	11.8	12.2	.900	.900	2.70	3.00
MAR										
01...	217	6.00	11.8	11.9	13.4	13.6	1.00	1.00	3.30	3.30
APR										
20...	187	11.4	9.10	9.40	11.7	11.8	.900	.900	3.40	3.20
JUN										
02...	177	12.6	8.80	9.00	12.1	12.5	.900	.900	3.20	3.30
JUL										
19...	200	14.3	11.4	10.0	15.8	6.80	1.00	1.00	3.40	4.60
SEP										
13...	251	13.8	14.8	15.2	18.6	19.3	1.10	1.20	4.20	4.40

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571780 -- Lorberry Creek at Lorberry Junction, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unfiltered end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfiltered recover- able, µg/L (01105)	Bromine water unfiltered mg/L (71871)
OCT 01...	3.20	3.41	<.010	81.4	.030	<.030	<.020	49.0	550	.080
OCT 28...	2.40	3.22	<.010	55.1	.090	<.030	<.020	200	600	.070
NOV 24...	1.90	3.26	<.010	69.1	.060	<.030	<.020	300	500	.060
DEC 30...	2.20	3.50	<.010	69.2	.060	<.030	<.020	200	500	.070
MAR 01...	4.10	5.12	--	83.0	--	--	--	<100	400	--
APR 20...	2.30	4.06	--	73.5	--	--	--	<100	500	--
JUN 02...	6.60	4.71	--	70.9	--	--	--	<100	400	--
JUL 19...	2.10	4.52	--	85.4	.070	--	--	<100	300	--
SEP 13...	3.40	5.27	<.010	105	.100	<.030	<.020	<100	500	.040

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfiltered recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfiltered recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfiltered recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfiltered recover- able, µg/L (01092)
OCT 01...	1300	2500	970	985	46.0	49.0	119	124
OCT 28...	1270	2000	640	630	35.0	39.0	74.0	75.0
NOV 24...	1460	2090	1000	950	53.0	41.0	286	141
DEC 30...	1230	2330	970	1010	46.0	49.0	137	138
MAR 01...	990	1680	1030	1030	40.0	40.0	90.0	90.0
APR 20...	1630	2950	860	910	50.0	50.0	135	160
JUN 02...	1290	2170	930	960	35.0	35.0	70.0	75.0
JUL 19...	1260	400	1040	470	50.0	22.0	65.0	24.0
SEP 13...	1740	2800	1380	1420	55.0	55.0	120	130

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571758 -- Lower Rausch Creek near Lorberry Junction, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	1000	1028	89203	11	276	31	11.2	100	6.9	6.8
NOV 24...	1030	1028	89203	18	299	17	11.2	99	6.8	6.4
DEC 30...	1100	1028	89203	7.3	345	26	11.6	98	6.8	6.5
MAR 01...	1030	1028	89203	3.8	312	13	12.4	101	6.8	6.7
APR 20...	1000	1028	89203	7.5	227	15	11.2	102	7.0	6.6
JUN 02...	1015	1028	89203	5.4	225	18	10.6	99	7.5	6.8
JUL 19...	1015	1028	89203	5.2	222	12	10.5	100	7.2	6.6
SEP 13...	1015	1028	89203	3.8	217	15	10.3	100	7.3	6.7

Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)
OCT 28...	199	10.5	15.2	15.4	8.70	8.90	1.60	1.50	9.70	9.90
NOV 24...	281	10.1	21.1	19.7	13.0	12.1	1.70	1.50	11.4	9.70
DEC 30...	309	8.30	25.0	24.8	14.7	14.8	2.30	2.30	10.8	10.9
MAR 01...	347	6.50	25.9	26.4	14.8	15.3	2.50	2.60	14.0	14.0
APR 20...	296	11.1	22.4	22.9	12.9	13.0	2.00	2.00	10.5	10.7
JUN 02...	326	12.7	25.8	26.9	14.9	15.5	2.80	2.90	12.9	13.6
JUL 19...	330	14.0	26.0	11.2	14.6	16.7	2.60	.900	14.9	2.30
SEP 13...	382	14.1	34.9	35.4	19.6	19.9	3.10	3.10	16.5	16.8

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571758 -- Lower Rausch Creek near Lorberry Junction, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfltrd recover- able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	13.0	9.23	<.010	62.2	.150	<.030	<.020	<100	400	.070
NOV 24...	9.00	10.5	<.010	95.5	.080	<.030	<.020	<100	500	.090
DEC 30...	23.0	13.4	<.010	108	.110	<.030	<.020	<100	700	.100
MAR 01...	13.0	19.5	--	110	--	--	--	<100	500	--
APR 20...	14.0	15.5	--	99.4	--	--	--	<100	400	--
JUN 02...	15.0	17.0	--	116	--	--	--	<100	600	--
JUL 19...	15.0	16.3	--	104	.080	--	--	<100	800	--
SEP 13...	24.0	17.4	<.010	141	.140	<.030	<.020	<100	400	.080

Date	Iron, water, unfltrd recover- able, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)
OCT 28...	670	1540	550	610	38.0	33.0	43.0	54.0
NOV 24...	1360	1910	980	930	36.0	33.0	128	81.0
DEC 30...	930	2040	1170	1190	42.0	43.0	74.0	87.0
MAR 01...	840	1900	1170	1220	35.0	40.0	55.0	65.0
APR 20...	1220	2100	880	900	40.0	40.0	70.0	80.0
JUN 02...	760	1780	1000	1050	35.0	40.0	45.0	70.0
JUL 19...	850	2540	1000	1170	39.0	54.0	85.0	68.0
SEP 13...	230	2060	1240	1270	40.0	40.0	30.0	50.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571760 -- Lower Rausch Creek at Lorberry Junction, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency col- lecting sample, code (00027)	Agency ana- lyzing sample, code (00028)	Instan- taneous dis- charge, cfs (00061)	Oxi- dation re- duc- tion poten- tial, mV (00090)	Tur- bidity, water, unfltrd field, NTU (61028)	Dis- solved oxygen, mg/L (00300)	Dis- solved oxygen, percent of sat- uration (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	0930	1028	89203	12	332	18	11.3	100	6.7	6.8
NOV 24...	1015	1028	89203	7.5	347	12	11.3	100	6.4	6.4
DEC 30...	1045	1028	89203	9.3	338	17	11.8	99	6.4	6.8
MAR 01...	1000	1028	89203	3.5	355	13	12.9	102	6.5	6.8
APR 20...	0945	1028	89203	7.3	274	12	11.2	103	7.1	6.5
JUN 02...	0945	1028	89203	5.4	236	17	10.5	101	7.3	6.8
JUL 19...	1000	1028	89203	5.1	235	9.8	10.3	100	7.0	6.6
SEP 13...	1000	1028	89203	3.0	304	10	9.8	100	7.2	6.7

Date	Specif. conduc- tance, wat unfltrd µS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover- able, mg/L (00916)	Magnes- ium, water, fltrd, mg/L (00925)	Magnes- ium, water, unfltrd recover- able, mg/L (00927)	Potas- sium, water, fltrd, mg/L (00935)	Potas- sium, water, unfltrd recover- able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover- able, mg/L (00929)
OCT 28...	199	10.0	13.9	14.6	8.80	8.90	1.60	1.50	10.6	11.1
NOV 24...	273	9.80	20.8	19.0	12.8	11.6	1.70	1.50	11.3	9.50
DEC 30...	301	7.60	23.0	23.7	14.2	14.7	2.10	2.20	10.9	11.1
MAR 01...	343	5.30	25.1	25.4	14.6	14.7	2.40	2.40	13.0	13.1
APR 20...	295	11.8	22.2	22.6	12.7	12.7	2.00	2.00	10.7	10.5
JUN 02...	327	13.6	26.7	27.6	14.8	15.2	3.00	3.00	13.6	13.6
JUL 19...	327	15.1	25.7	25.6	14.7	14.6	2.70	2.50	14.3	14.5
SEP 13...	343	16.3	35.6	35.3	19.9	19.6	3.10	3.00	16.0	16.1

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571760 -- Lower Rausch Creek at Lorberry Junction, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfltrd recover -able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	15.0	9.62	<.010	60.9	.170	<.030	<.020	<100	300	.050
NOV 24...	16.0	11.6	<.010	93.0	.090	<.030	<.020	<100	400	.070
DEC 30...	15.0	13.5	<.010	103	.100	<.030	<.020	<100	600	.090
MAR 01...	19.0	19.7	--	109	--	--	--	<100	400	--
APR 20...	10.0	15.9	--	99.3	--	--	--	<100	300	--
JUN 02...	15.0	17.1	--	115	--	--	--	<100	400	--
JUL 19...	15.0	15.8	--	104	.080	--	--	<100	500	--
SEP 13...	24.0	16.9	.020	141	.130	<.030	<.020	<100	300	.070

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover -able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover -able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover -able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover -able, µg/L (01092)
OCT 28...	510	1010	550	570	33.0	20.0	40.0	52.0
NOV 24...	1000	1390	940	870	36.0	34.0	125	72.0
DEC 30...	730	1850	1130	1150	39.0	42.0	75.0	81.0
MAR 01...	580	1650	1150	1150	35.0	40.0	55.0	60.0
APR 20...	850	1670	840	860	35.0	40.0	65.0	80.0
JUN 02...	360	1210	980	1020	35.0	40.0	45.0	55.0
JUL 19...	470	1550	1020	1010	37.0	39.0	92.0	34.0
SEP 13...	90.0	940	1100	1100	35.0	35.0	25.0	35.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571798 -- Swatara Creek at Lorberry Junction, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 28...	0900	1028	89203	317	393	39	11.3	98	6.3	6.5
NOV 24...	0930	1028	89203	66	309	7.0	11.6	100	6.8	6.2
DEC 30...	1015	1028	89203	81	352	13	13.2	101	6.8	6.6
MAR 01...	0930	1028	89203	53	397	10	13.5	100	6.5	6.5
APR 20...	0915	1028	89203	76	334	13	10.8	100	6.9	6.5
JUN 02...	0900	1028	89203	61	344	32	10.3	99	7.2	6.7
JUL 19...	0930	1028	89203	75	326	10	9.8	100	7.0	6.3
SEP 13...	0930	1028	89203	31	332	4.0	10.3	104	7.2	6.4

Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recoverable, mg/L (00929)
OCT 28...	99.0	9.30	6.70	7.00	4.20	4.40	1.40	1.40	4.00	4.00
NOV 24...	161	8.50	10.5	9.80	7.90	7.30	1.00	.900	5.50	5.00
DEC 30...	168	5.00	10.7	10.9	8.60	8.60	1.10	1.00	4.60	5.00
MAR 01...	188	2.90	11.8	11.8	8.20	8.20	1.30	1.30	6.60	6.60
APR 20...	158	12.3	10.3	10.4	6.90	7.10	1.10	1.10	5.70	5.50
JUN 02...	180	13.6	12.4	12.9	8.70	9.20	1.50	1.50	6.20	6.80
JUL 19...	152	16.4	10.1	26.5	6.90	14.6	1.20	2.60	4.60	14.1
SEP 13...	221	15.4	<.100	18.2	<.100	12.2	<.100	1.30	4.50	6.30

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES
SWATARA CREEK PROJECT--Continued**

01571798 -- Swatara Creek at Lorberry Junction, PA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)	Chlor- ide, water, fltrd, mg/L (00940)	Fluor- ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, unfltrd recover- able, µg/L (01105)	Bromine water unfltrd mg/L (71871)
OCT 28...	7.20	5.50	<.010	28.6	.190	<.030	<.020	200	500	.060
NOV 24...	5.50	7.10	<.010	48.9	.120	<.030	<.020	<100	300	.050
DEC 30...	12.0	8.14	<.010	53.1	.200	<.030	<.020	<100	400	.080
MAR 01...	7.50	12.1	--	53.4	--	--	--	<100	400	--
APR 20...	4.90	10.0	--	46.5	--	--	--	<100	300	--
JUN 02...	9.00	11.2	--	55.5	--	--	--	<100	300	--
JUL 19...	5.50	8.64	--	41.7	.680	--	--	<100	400	--
SEP 13...	7.10	11.3	.010	73.0	.300	.030	<.020	<100	<100	<.010

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)
OCT 28...	220	860	380	470	15.0	16.0	33.0	39.0
NOV 24...	430	650	550	510	17.0	21.0	146	58.0
DEC 30...	360	980	530	530	20.0	20.0	53.0	52.0
MAR 01...	200	830	630	620	25.0	20.0	45.0	45.0
APR 20...	150	810	390	420	20.0	20.0	50.0	65.0
JUN 02...	250	850	490	550	20.0	25.0	35.0	45.0
JUL 19...	100	1180	450	1000	21.0	38.0	49.0	30.0
SEP 13...	<10.0	220	<10.0	470	10.0	20.0	<5.00	35.0