

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

Assessment of Water Quality in the Bear Creek Watershed, With Emphasis on Abandoned Mine Drainage, Dauphin County, Pennsylvania

The aquatic habitat of Bear Creek and its receiving waters are degraded by Abandoned Mine Drainage (AMD). Impacts from iron, manganese, sulfate, and acidity loading originate at two large discharges and multiple diffuse seeps draining the Lykens-Williamstown mine pool complex. Proposed remediation involves using nearby coal spoil to fill abandoned strip pits which have been identified as major sources of surface water to the underlying mine pool. The hydrologic and chemical effects of this remedial action are unknown due to the complexity of the underlying mine pool flow paths and undetermined interaction of infiltrating surface water with buried coal spoil.

The following data represent conditions in Bear Creek prior to any remediation. The objective of this study is to determine the effects of proposed remediation by comparison of baseline data with data collected after remediation is in place. U.S. Geological Survey (USGS) has been collecting baseline chemical and hydrologic data at two mine discharges and three surface water sites in the Bear Creek watershed since October 1999. Only data collected during water year 2001 (10/01/2000-09/30/2001) are included in this report. All previously collected data can be found in the annual Water Data Report PA-00-2.

A total of eleven sites were sampled this water year (see map below). Site WC1 is located on Wiconisco Creek below its confluence with Bear Creek. Site WC2 is located on Wiconisco Creek above its confluence with Bear Creek. These two sites were added to determine the impact of Bear Creek on water quality of Wiconisco Creek. Site BC1 is at the mouth of Bear Creek and represents conditions prior to mixing with Wiconisco Creek. Site BC2 is a surface water site located immediately below all mining inputs. Sites BC3 and BC4 are underground mine discharges draining the Lykens-Williamstown mine pool complex. Even though they drain the same mine pool the chemical signatures of these sites are different, possibly due to stratification in the pool, or poorly connected flow paths which limit mixing. Site BC5 is a control site above all mining impacts. Sites BC6, BC7, BC8, and BC9 are located in the headwaters of Bear Creek above all mine discharge inputs. These 4 sites were sampled under normal-flow and low-flow conditions to identify reaches of Bear Creek that lose water to the underlying mine pool.

For additional information, contact Jeff Chaplin at the U.S. Geological Survey, 215 Limekiln Road, New Cumberland, Pennsylvania 17070; phone - (717) 730-6957 (email - jchaplin@usgs.gov).

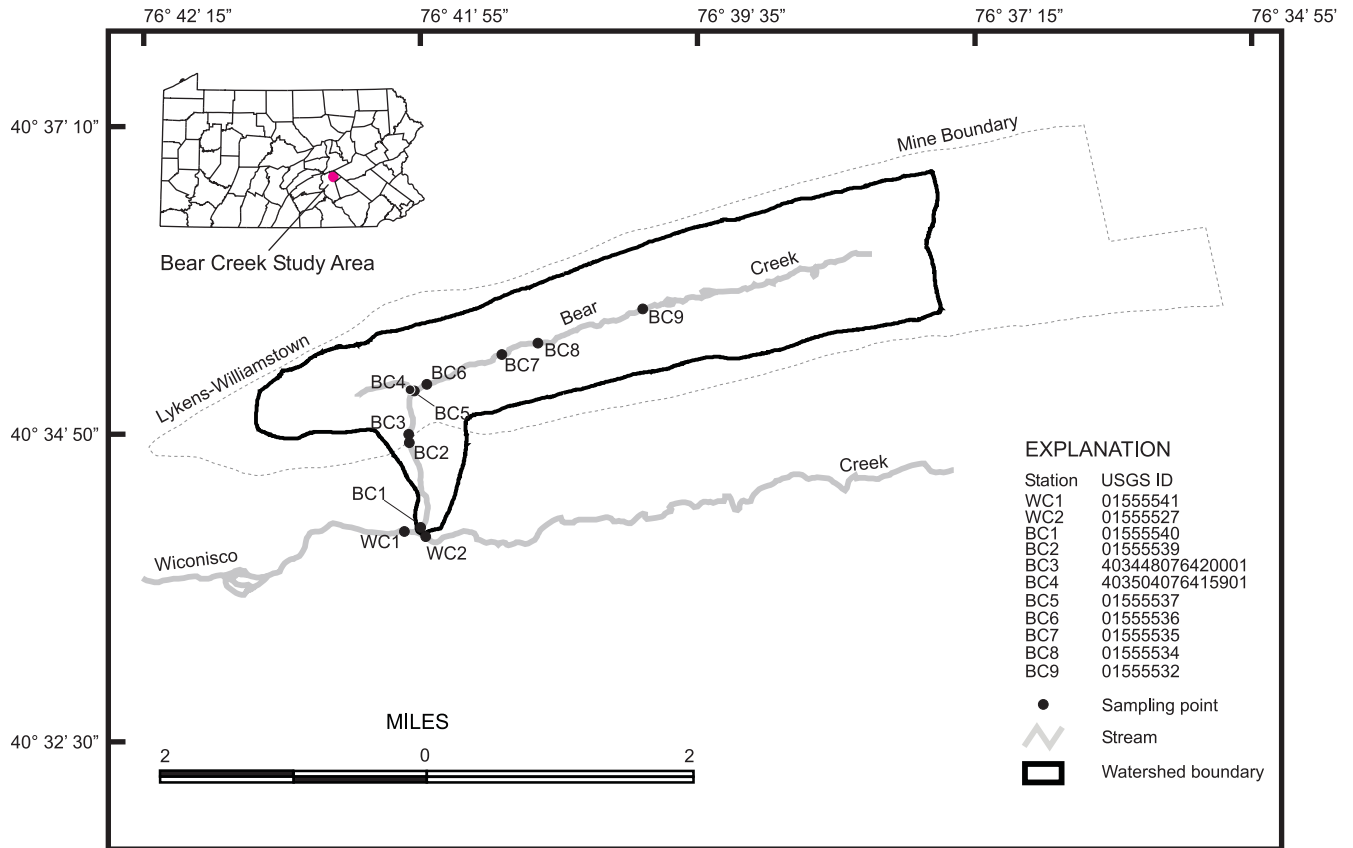


Figure 9.--Location of sites sampled for the Bear Creek Watershed project.

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

0155527 WICONISCO CREEK (WC2) US BEAR CREEK AT LYKENS, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANA-LYZING SAMPLE NUMBER (00028)	AGENCY COL-LECTING SAMPLE NUMBER (00027)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (MG/L) (00300)	OXYGEN, (PER-CENT SATUR-ATION) (MG/L) (00301)	PH WATER WHOLE FIELD (STAND-ARD) UNITS (00400)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	SODIUM, TOTAL RECOV-ERABLE AS NA (MG/L) (00929)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)
JUL 2001 25...	0845	9813	1028	--	6.9	79	7.0	224	21.1	7.8	.00
AUG 07...	1000	9813	1028	17	7.0	80	6.6	183	21.6	7.2	.00
SEP 20...	0945	9813	1028	E5.8	6.7	70	7.0	253	15.8	9.6	.00

DATE	POTEN-TIAL (MV) (00090)	OXID-ATION RED-UCTION FET LAB (MG/L AS CAC03) (00417)	ANC WATER UNFLTRD SULFATE (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105)	IRON, DIS-SOLVED (µG/L AS FE) (01046)	IRON FERROUS WATER FLTRD (µG/L AS FE) (01047)	IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045)	MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056)	MANGA-TOTAL RECOV-ERABLE (µG/L AS MN) (01055)
JUL 2001 25...	244	18	69.6	16	<200	80	<500	480	250	259
AUG 07...	299	18	45.6	<2	203	130	<500	850	233	252
SEP 20...	325	24	73.8	22	<200	110	<500	540	168	174

0155532 BEAR CREEK (BC9) NEAR WICONISCO, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANA-LYZING SAMPLE NUMBER (00028)	AGENCY COL-LECTING SAMPLE NUMBER (00027)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (MG/L) (00300)	OXYGEN, (PER-CENT SATUR-ATION) (MG/L) (00301)	PH WATER WHOLE FIELD (STAND-ARD) UNITS (00400)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)
MAR 2001 20...	1545	1028	1028	1.2	10.8	87	4.8	33	6.5
AUG 07...	1215	1028	1028	E.05	5.8	66	5.9	11	22.0

0155534 BEAR CREEK (BC8) NEAR WICONISCO, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANA-LYZING SAMPLE NUMBER (00028)	AGENCY COL-LECTING SAMPLE NUMBER (00027)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (MG/L) (00300)	OXYGEN, (PER-CENT SATUR-ATION) (MG/L) (00301)	PH WATER WHOLE FIELD (STAND-ARD) UNITS (00400)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)
MAR 2001 20...	1345	1028	1028	2.0	10.7	85	4.5	39	5.6
AUG 07...	1115	1028	1028	.07	4.7	53	5.0	36	21.5

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

01555535 BEAR CREEK (BC7) NEAR WICONISCO, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANA- LYZING SAMPLE NUMBER (00028)	AGENCY COL- LECTING SAMPLE NUMBER (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)
MAR 2001 20...	1230	1028	1028	2.3	11.4	89	4.6	40	4.7
AUG 07...	1030	1028	1028	.07	6.4	70	4.9	37	20.1

01555536 BEAR CREEK (BC6) NEAR WICONISCO, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANA- LYZING SAMPLE NUMBER (00028)	AGENCY COL- LECTING SAMPLE NUMBER (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)
MAR 2001 20...	1710	1028	1028	2.4	13.1	100	4.4	39	4.3
AUG 07...	1000	1028	1028	E.01	6.7	73	4.4	47	19.4

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

01555537 BEAR CREEK (BC5) AT WICONISCO, PA

WATER-QUALITY DATA, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)
OCT 2000											
31...	1300	9813	1028	.16	12.1	104	4.5	37	8.7	.6	13
NOV											
22...	1430	9813	1028	.27	12.9	96	5.5	40	3.1	.6	15
DEC											
21...	1330	9813	1028	4.2	14.6	100	4.3	40	.2	.6	10
JAN 2001											
10...	1115	9813	1028	1.6	13.5	94	5.7	36	.7	.6	13
FEB											
16...	1330	9813	1028	4.8	13.3	94	4.5	39	1.0	.5	9.8
MAR											
14...	1415	9813	1028	4.7	--	--	5.8	56	--	.6	7.6
20...	1340	9813	1028	3.0	12.7	98	5.0	49	4.3	--	--
22...	1100	9813	1028	9.7	10.5	79	4.4	37	3.5	.6	8.8
APR											
25...	1100	9813	1028	1.7	10.7	97	5.2	37	10.8	.7	7.8
MAY											
24...	1145	9813	1028	.96	10.3	98	4.8	31	12.8	.7	13
JUN											
27...	1400	9813	1028	.54	8.9	95	5.0	32	17.5	.7	49
JUL											
25...	1115	9813	1028	<.01	1.4	14	5.9	90	13.2	.7	35
AUG											
07...	1345	9813	1028	.00	2.3	23	5.9	77	13.5	.8	34
SEP											
20...	1200	9813	1028	.00	.9	8	6.1	98	12.5	.7	36

DATE	OXID- ATION RED- DUCTION POTEN- TIAL (MV) (00090)	TUR- BID- ITY FIELD WATER UNFLTRD (NTU) (61028)	ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	IRON FERROUS WATER FLTRD (µG/L) (01047)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)
OCT 2000											
31...	420	<1	7	<20.0	24	399	990	<500	1510	587	592
NOV											
22...	482	.9	6	<20.0	10	354	860	<500	1030	565	577
DEC											
21...	467	.8	7	<20.0	<2	310	410	<500	550	252	250
JAN 2001											
10...	654	<1	8	<20.0	<2	245	550	<500	580	376	379
FEB											
16...	450	1.0	7	<20.0	<2	264	480	<500	460	199	192
MAR											
14...	--	--	6	<20.0	<2	283	300	600	360	197	191
20...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	4	<20.0	8	277	340	<500	450	209	197
APR											
25...	--	--	3	<20.0	4	347	360	--	520	240	235
MAY											
24...	379	--	7	<20.0	14	451	1880	1000	1850	298	312
JUN											
27...	372	--	7	<20.0	6	583	2600	<500	4140	393	408
JUL											
25...	233	--	12	23.9	<2	<200	3040	2400	7380	823	748
AUG											
07...	259	--	16	<20.0	<2	<200	3930	3400	7280	814	781
SEP											
20...	216	--	20	24.8	8	<200	7090	5000	7500	854	889

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

0155540 BEAR CREEK (BC1) AT MOUTH AT LYKENS, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, (PER- CENT SATUR- ATION) (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)
OCT 2000											
31...	1050	9813	1028	E7.8	11.4	100	7.2	255	12.5	4.6	.00
NOV											
22...	1530	9813	1028	7.6	11.1	97	7.0	288	9.4	4.8	.00
DEC											
21...	1115	9813	1028	E13	12.0	98	6.4	186	6.5	3.0	.00
JAN 2001											
10...	1300	9813	1028	E7.9	10.8	95	6.6	262	9.9	4.5	.00
FEB											
16...	1500	9813	1028	E12	11.3	93	6.1	176	7.2	3.0	.00
MAR											
14...	1430	9813	1028	E19	--	--	6.3	165	--	2.5	.00
20...	1025	9813	1028	12	10.7	94	7.0	203	9.7	--	--
20...	1026	9813	1028	12	11.2	99	7.0	222	9.8	--	--
22...	1500	9813	1028	E19	10.4	88	6.7	156	7.5	2.4	.00
APR											
25...	0730	9813	1028	17	10.9	99	7.6	228	10.8	3.0	.00
MAY											
24...	0830	9813	1028	8.5	10.1	97	7.2	246	13.2	3.6	.00
JUN											
27...	1030	9813	1028	5.9	9.9	99	7.4	245	15.4	3.7	.00
JUL											
25...	0900	9813	1028	E5.5	10.1	101	7.4	262	15.0	4.6	.00
AUG											
07...	1130	9813	1028	5.4	9.0	98	7.5	267	17.2	4.6	.00
SEP											
20...	1000	9813	1028	5.6	9.0	89	7.5	274	14.5	5.2	.00

DATE	OXID- ATION- RED- UCTION POTEN- TIAL (MV) (00090)	TUR- BID- ITY FIELD WATER UNFLTRD (NTU) (61028)	ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	IRON, DIS- SOLVED WATER (µG/L AS FE) (01046)	IRON FERROUS FLTRD (µG/L) (01047)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)
OCT 2000											
31...	236	91	74	94.0	48	<200	630	<500	1790	1770	1840
NOV											
22...	268	130	78	81.0	24	<200	1420	<500	13700	1620	1770
DEC											
21...	426	9.3	42	46.0	30	<200	4100	1000	7550	1120	1110
JAN 2001											
10...	239	89	70	66.0	16	<200	2080	<500	10600	1610	1680
FEB											
16...	348	27	44	55.0	20	207	3630	600	8240	1130	1150
MAR											
14...	--	--	36	41.6	12	214	3510	3200	8310	867	912
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	34	41.0	94	227	3410	2800	9560	870	903
APR											
25...	--	--	52	59.6	14	<200	3550	--	10000	1470	1450
MAY											
24...	154	--	64	68.7	24	<200	1260	1000	1080	1670	1680
JUN											
27...	236	--	68	65.5	24	<200	1500	<500	11700	1670	1730
JUL											
25...	110	--	76	82.1	12	<200	930	1000	10500	1890	1960
AUG											
07...	256	--	76	86.8	18	<200	90	<500	14900	1730	1840
SEP											
20...	199	--	84	77.9	34	<200	230	<500	16100	1770	1990

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

01555541 WICONISCO CREEK (WC1) DS BEAR CREEK AT LYKENS, PA

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANA- LYZING SAMPLE NUMBER (00028)	AGENCY COL- LECTING SAMPLE NUMBER (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)	SODIUM, TOTAL RECOV- ERABLE AS NA (00929)	ACIDITY TOTAL HEATED AS CAC03 (70508)
JUL 2001 25...	0800	9813	1028	--	7.9	85	7.0	250	18.7	6.9	.00
AUG 07...	0900	9813	1028	21	8.0	95	7.0	205	19.8	6.5	.00
07...	0901	9813	1028	21	8.6	95	7.0	218	19.7	--	--
SEP 20...	0845	9813	1028	11	7.9	78	7.2	262	15.1	7.8	.00

DATE	OXID- ATION RED- UCTION POTEN- TIAL (MV) (00090)	ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	IRON FERROUS WATER FLTRD (µG/L) (01047)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)
JUL 2001 25...	210	40	73.7	10	<200	320	600	3920	831	896
AUG 07...	245	32	49.4	2	<200	150	--	3520	632	692
07...	--	--	--	--	--	--	--	--	--	--
SEP 20...	300	50	56.0	<2	<200	100	<500	6700	875	942

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

403448076420001 LYKENS-WILLIAMSTOWN SEEP (BC3)

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)
OCT 2000											
31...	1200	9813	1028	2.6	.5	5	7.1	328	13.3	5.1	.00
NOV											
22...	1445	9813	1028	2.6	.5	5	6.1	364	13.3	5.3	.00
DEC											
21...	1300	9813	1028	2.8	.5	4	6.3	352	13.3	5.5	.00
JAN 2001											
10...	1145	9813	1028	2.7	1.5	15	6.1	353	13.2	5.3	.00
FEB											
16...	1315	9813	1028	2.7	.2	2	6.3	365	13.2	5.6	.00
MAR											
14...	1330	9813	1028	2.7	--	--	6.2	357	--	5.3	.00
20...	1210	9813	1028	3.0	3.0	34	6.9	344	13.1	--	--
22...	1300	9813	1028	2.8	.8	8	6.3	359	12.5	5.1	.00
APR											
25...	0945	9813	1028	5.8	.3	3	6.7	353	13.2	4.4	.00
MAY											
24...	1030	9813	1028	2.4	.6	6	6.4	355	13.3	4.8	.00
JUN											
27...	1300	9813	1028	2.0	.5	5	6.5	341	13.4	4.9	.00
JUL											
25...	1030	9813	1028	2.6	1.1	12	6.5	338	13.4	4.7	.00
AUG											
07...	1245	9813	1028	1.2	.4	4	6.5	334	13.4	4.7	.00
SEP											
20...	1100	9813	1028	1.7	.6	6	6.8	334	13.4	5.5	.00

DATE	OXID- ATION RED- DUCTION POTEN- TIAL (MV) (00090)	TUR- BID- ITY FIELD WATER UNFLTRD (NTU) (61028)	ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	IRON FERROUS WATER FLTRD (µG/L) (01047)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)
OCT 2000											
31...	172	<1	120	82.0	30	<200	19800	1600	20600	2220	2290
NOV											
22...	243	.2	116	76.0	8	<200	18500	1800	19000	1980	2110
DEC											
21...	235	<1	124	69.0	36	<200	18300	2600	18300	2230	2210
JAN 2001											
10...	222	<1	120	68.0	10	<200	21400	1400	21500	2140	2170
FEB											
16...	178	<1	122	76.0	6	<200	19500	1600	19700	2260	2340
MAR											
14...	--	--	112	65.9	22	<200	17900	6000	18700	2250	2310
20...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	116	62.4	4	<200	20100	8200	19700	2300	2190
APR											
25...	--	--	106	62.7	8	<200	19500	--	20300	2240	2220
MAY											
24...	187	--	116	80.3	12	204	20100	3800	19700	2030	2100
JUN											
27...	147	--	116	66.3	22	<200	18300	5800	19100	2180	2190
JUL											
25...	151	--	122	78.6	10	<200	17900	5200	17700	2280	2230
AUG											
07...	154	--	120	86.8	6	<200	19300	4800	18400	2210	2160
SEP											
20...	170	--	126	83.1	4	<200	18200	4400	17900	2260	2230

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

403504076415901 LYKENS-WILLIAMSTOWN MINE (BC4)

WATER-QUALITY DATA, OCTOBER 2000 TO SEPTEMBER 2001

DATE	TIME	AGENCY ANALYZING SAMPLE NUMBER (00028)	AGENCY COLLECTING SAMPLE NUMBER (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)
OCT 2000											
31...	1230	9813	1028	.84	9.5	85	5.6	180	10.6	.8	8.6
NOV											
22...	1415	9813	1028	.80	10.1	89	5.7	200	9.9	.7	16
DEC											
21...	1315	9813	1028	1.4	8.7	78	5.9	228	10.1	1.0	5.2
JAN 2001											
10...	1100	9813	1028	.86	8.9	79	6.5	176	10.1	.7	6.6
FEB											
16...	1330	9813	1028	1.4	8.7	77	5.9	181	10	.7	1.4
MAR											
14...	1400	9813	1028	1.4	--	--	6.0	179	--	.9	.00
20...	1255	9813	1028	2.3	10.3	91	7.0	169	9.8	--	--
22...	1200	9813	1028	2.9	8.8	74	5.9	169	8.0	.7	.00
APR											
25...	1015	9813	1028	3.6	8.7	78	5.9	164	9.9	.8	.00
MAY											
24...	1115	9813	1028	1.8	9.0	83	5.8	180	10.4	.9	.00
JUN											
27...	1330	9813	1028	1.1	9.1	83	5.8	179	10.7	.9	44
JUL											
25...	1100	9813	1028	1.2	8.5	77	5.8	189	10.9	.7	51
AUG											
07...	1330	9813	1028	1.1	8.3	76	5.8	192	11.0	.7	51
SEP											
20...	1130	9813	1028	1.1	8.4	76	5.9	203	10.8	.8	.00

DATE	OXID- ATION RED- DUCTION POTEN- TIAL (MV) (00090)	TUR- BID- ITY FIELD WATER UNFLTRD (NTU) (61028)	ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	IRON FERROUS WATER FLTRD (µG/L) (01047)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)
OCT 2000											
31...	333	99	12	63.0	38	229	9780	1000	13200	1030	1060
NOV											
22...	482	86	4	72.0	18	<200	7700	1000	12600	998	1010
DEC											
21...	356	26	26	79.0	10	869	11900	1600	14200	1020	1050
JAN 2001											
10...	630	110	16	62.0	20	302	4550	1200	9810	874	883
FEB											
16...	341	83	15	65.0	4	419	4020	600	8930	746	777
MAR											
14...	--	--	15	68.2	4	621	3380	3000	12900	832	876
20...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	15	56.1	14	442	3160	3200	8550	731	756
APR											
25...	--	--	10	62.4	4	807	910	--	7760	810	804
MAY											
24...	311	--	14	55.7	224	967	4150	2200	4410	881	918
JUN											
27...	317	--	11	47.3	<2	371	5860	2800	10100	983	1010
JUL											
25...	243	--	11	67.3	16	282	7170	4600	10900	1100	1070
AUG											
07...	283	--	11	37.1	8	281	7460	6000	13000	1110	1110
SEP											
20...	294	--	15	69.4	14	288	9630	5000	13700	1150	1180