SUB-WATERSHED 3L

(POKEYTOWN RUN)

Sub-watershed 3L (Pokeytown Run)

General Discussion

This sub-watershed encompasses 2.5 square miles or 1,580 acres of land which is approximately 1.77% of the total study area. It is drained by 10.7 miles of tributaries (4.56% of the total lakes and ponds (.09% of this sub-watershed area). Commonwealth records indicate there are 5 surface mines and 10 deep mines. Our field investigations have located 9 surface mines, 3 flowing, and 19 deep mine openings, 9 having flows.

The following is a summation of the flows from the two sampling stations located at the mouth of the two major tributaries in this sub-watershed and designated as SC3L1 and SC3L2 (Pokeytown Run), located on drawing 7119-6. The percentage that these stations contribute in pollution load and flow to the total pollution load and flow, as measured at Monitoring Station SC1 on Stony Creek, is also included.

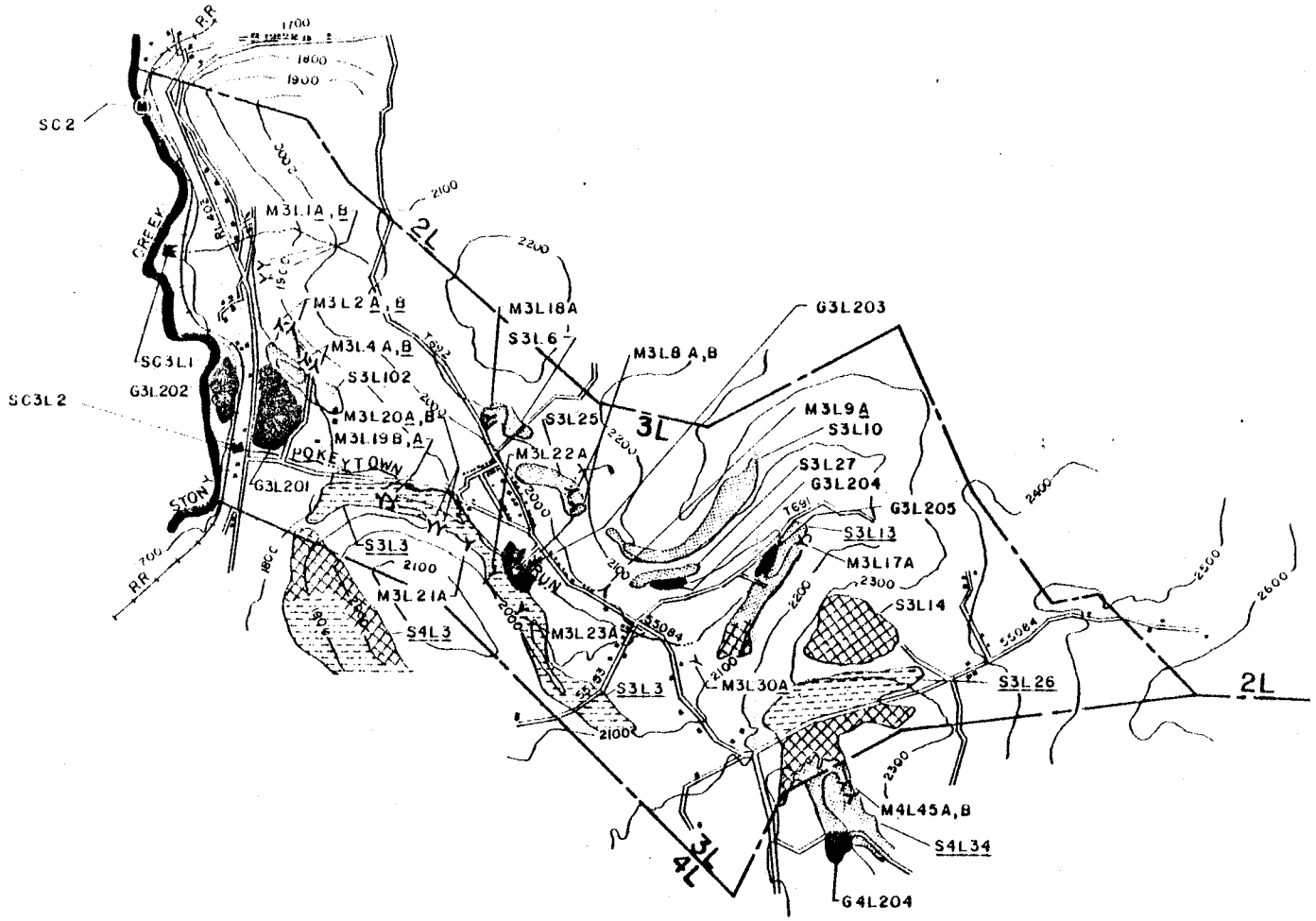
	Averages	Percent of Total Watershed
pH	5.1	
Net Cold Acidity	1,539.29 PPD	4.99%
Net Hot Acidity	1,209.68 PPD	1.11%
Ferrous Iron	7.23 PPD	.94%
Total Iron	88.48 PPD	1.98%
Sulfate	3,685.14 PPD	1.91%
Hardness	3,809.42 PPD	1.85%
Flow	2,489,760 GPD	1.56%

The following plate shows the locations of all deep mine openings and strip mines where they exist within this sub-watershed, as well as the locations of all sampling stations.

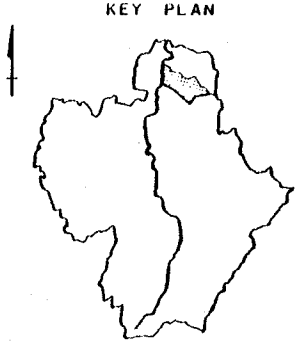
Deep Mines

The Commonwealth records indicate that there are 10 deep mines in this sub-watershed. Our field investigations locate 19 deep mine openings of which 9 are flowing. Table 90 lists the abandoned deep mines within this sub-watershed with the following information: name of mine or operator if known, available mine maps, acres and seam mined, mine opening designation, openings with flows, estimated elevation of openings and the head in feet, which is the difference in coal elevations on an up-dip mine.

Table 91 gives the averages of the abandoned deep mine flows. Directly under the averages are the percentages of flows and pollution loads that each contributes to the pollution load and flow of the sub-watershed as measured at Sampling Stations SC3L1 and SC3L2 (Pokeytown Run). The readings at these two stations are combined to give total pollution values for this sub-watershed. The averages, taken at mine openings, are added together where more than one opening of a mine complex has a flow.



KEY PLAN



MAP OF SUB-WATERSHED 3L
(POKEYTOWN RUN)

2000' 0 2000'

SCALE IN FEET

TABLE 90

Abandoned Deep Mines
Sub-watershed 3L

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M3L1	Wilber Coal Mining Co.	No	-	B*	M3L1A	1840'	Yes	50'
				B*	M3L1B	1840'	Yes	
≠M3L2	Solar Mine	Yes	266	C'	M3L2A	1870'	Yes	45'
				C'	M3L2B	1870'	Yes	
≠M3L4	(See M1L3 & M2L1)	-	-	B	M3L4A	1860'	No	25'
				B	M3L4B	1860'	Yes	
→M3L8	(See M3L2)	-	-	C'	M3L8A	2060'	No	-
				C'	M3L8B	2060'	No	
M3L9	A. M. & K Corp. Wilber #4 (See M1L3)	-	-	B	M3L9A	2020'	Yes	260'
◊M3L17	A. M. & K. Corp. Wilber #4 (See M1L3)	-	-	B	M3L17A	2140'	No	-
≗M3L18	Unknown	No	-	C'	M3L18A	2060'	No	-
"M3L19	A. M. & K. Corp.	Part.	9	B	M3L19A	1870'	Yes	20'
				B	M3L19B	1870'	No	-
"M3L20	A. M. & K. Corp.	Part.	11	B	M3L20A	1930'	Yes	25'
				B	M3L20B	1930'	No	
"M3L21	(See M3L20)	-	-	B	M3L21A	1930'	No	-
"M3L22	Curtis Berkey	Part.	10	B	M3L22A	1950'	No	-
"M3L23	A. M. & K.	Part.	10	B	M3L23A	2000'	No	-

TABLE 90 (contd.)

Abandoned Deep Mines
Sub-watershed 3L

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M3L30	Unknown	No	-	B*	M3L30A	2060'	Yes	275'

*Indicates assumed.

✓Possible connection with Strip Mine S3L102.

→Possible connection with Strip Mine S3L25.

◊Possible connection with Strip Mine S3L13.

&Possible connection with Strip Mine S3L6.

"Possible connection with Strip Mine S3L30A.

TABLE 91

Abandoned Deep Mine Average Water Quality Data

Sub-watershed 3L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
M3L1	6.8	0	*	0	.02	3.89	6.75	8,640
		-		-	-	.1%	.2%	.4%
M3L2	5.3	4.92	0	.02	.54	36.15	35.03	27,360
		.3%	-	.3%	.6%	1%	.9%	1.1%
M3L4	3.2	17.60	6.56	.18	1.40	22.59	28.32	10,080
		1.1%	.5%	2.5%	1.6%	.6%	.88%	.4%
M3L9	2.8	416.00	209.10	2.97	110.00	566.00	256.30	87,840
		26.7%	17.3%	41.1%	124.3%	15.4%	6.7%	3.5%
M3L19	3.2	1.68	4.48	.07	.54	7.38	4.95	2,880
		.1%	.4%	1%	.6%	.2%	.1%	.1%
M3L20	3.2	15.07	40.70	.04	1.13	41.53	61.72	28,800
		1%	3.4%	.6%	1.3%	1.1%	1.6%	1.2%
M3L30	2.9	548.89	469.70	4.62	102.90	1,146.03	641.80	234,720
		35.2%	38.8%	63.9%	116.3%	31.1%	16.9%	9.4%

* Not analyzed.

Strip Mines

The Commonwealth records indicate that there are 5 strip mines in this sub-watershed. Our field investigations locate 9 surface mines with 3 flowing. Table 92 lists the abandoned strip mines within this sub-watershed with the following information: the name of the mine or operator if known, the area and seam mined, the designation we give the mine, whether or not there is a flow, and whether it connects with a deep mine.

The total acreage of abandoned surface mines in subwatershed 3L is 199.19 acres (12.61% of this sub-watershed area).

Table 93 gives the averages of the abandoned surface mine flows. Directly under the averages are the percentages of flows and pollution load that each contributes to the pollution load and flow of the sub-watershed as measured at Sampling Stations SC3L1 and SC3L2 (Pokeytown Run).

Where a single surface mine has more than one flow, the averages of the flows are added together.

Following Table 93 are the descriptions of the flowing strip mines along with abatement recommendations.

TABLE 92

Abandoned Surface Mines

Sub-watershed 3L

Mine Number	Name of Mine or Operator	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S3L3	Lebor Coal Co.	53.24	B	Yes	M3L19, M3L20, M3L21, M3L22, M3L23
S3L6	Alumbaugh Coal Co.	6.43	E,D,C'	No	M3L18
S3L10	Somerset High Grade Coal Co.	17.44	C',B	No	No
S3L13	Nick Yonish	17.44	C',C	Yes	M3L17
S3L14	Toth & Cook	25.70	C'	No	No
S3L25	Unknown	8.26	-	No	M3L8
S3L26	Unknown	53.24	-	Yes	No
S3L27	Unknown	4.59	-	No	No
S3L102	Unknown	12.85	-	No	M3L2, M3L4

TABLE 93

Abandoned Surface Mine Average Water Quality Data

Sub-watershed 3L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
S3L3	4.0	71.82	*	.84	2.44	262.99	*	247,680
		.5%		11.6%	2.8%	7.1%		10%
S3L13	5.4	12.39	*	2.69	6.82	192.15	*	292,320
		.8%		37.2%	7.7%	5.2%		11.7%
S3L26	6.4	0	*	.99	3.94	111.20	*	36,000
		-		13.7%	4.5%	3%		1.5%

*Not analyzed.

Strip Mine: S3L3

Area: 53.24 acres

Location: South of Pokeytown Run

Status: Abandoned

Owned by: Lebor Coal Co.

Seam mined: B

Connection with deep mines: M3L19, M3L20, M3L21, M3L22 and M3L23

Flowing: Two leaching areas

General Description:

A 15' tall highwall runs along the southern side of the strip mine area. Water collects at the base of the highwall in small depressions. This area has numerous spoil piles with good vegetation.

Recommendation:

A drainage ditch at base and at the top of the highwall is required. Some grubbing and minimal earth moving is also necessary. The five deep mine complexes and this strip mine reclamation should be done in conjunction with each other.

Cost:

Ditching		10,000'	$10,000
Grading	20% or 10 acres @	$1000/acre	10,000
Grubbing			500
Revegetation		10 acres	6,000
		Total	$26,500

Strip Mine: S3L13

Area: 17.44 acres

Location: East of Pokeytown Run, bordered by T.R. T 691 and L. R. 55054

Status: Partly abandoned and partly reclaimed

Owned by: Nick Yonish

Seams mined: C, and C'

Connection with deep mine: M3L17

Flowing: Two leaching areas

General Description:

Very similar to S3L3, the highwall being approximately 10' to 20' high. Low areas between highwall and spoil piles collect. water and allow leaching. One deep mine is located within the strip.

Recommendation:

A ditch system installed above and below the highwall is required. The one deep mine and the strip mine reclamation should be done in conjunction with each other.

Cost:

Ditching	3,000'	$ 3,000
Grading	20% or 10 acres	10,000
Revegetation		2,000
	Total	$15,000

Recommendations

Table 94 gives the recommendations for the polluting deep and surface mines along with the costs associated with each recommendation.

An estimated effectiveness of 60% reduction of pollution load is assigned for each recommendation.

Table 95 lists the sources abated, the amount of benefication and the costs associated with each plan.

The distance from Station SC3L2, Pokeytown Run, to the next polluting tributary downstream, SC2L1, Fallen Timber Run, is 2.27 miles. This is the minimum distance on Stony Creek that would benefit from this sub-watershed being cleaned up.

TABLE 94

Recommended Abatement Procedures - Cost Benefication

Sub-watershed 3L

Rank	Number	Recommended Abatement		Total Costs		Cost $/Pound Acid Removal		Total Acid Abatement ppd	Total Iron Abatement ppd	Percent of Total Sub-watershed	
		Known Sources	Potential Sources	Known Sources	Potential Sources	Known Sources	Potential Sources			Acid	Iron
1	M3L30	1 Seal	-	$20,000	$ 20,000	$ 61	$ 61	329.33	61.74	21.12	69.78
2	M3L9	1 Seal	4 Seals	20,000	100,000	80	401	249.60	66.00	16.01	75.59
3	S3L3	53.24 Acres	2 Seals	26,500	46,500	615	1,079	43.09	1.46	2.76	1.65
4	S3L13	17.44 Acres	-	15,000	15,000	2,019	2,019	7.43	4.09	.48	4.62
5	M3L4	2 Seals	6 Seals	40,000	160,000	3,788	15,151	10.56	.84	.68	.95
6	M3L20	2 Seals	2 Seals	40,000	80,000	4,425	8,850	9.04	.68	.58	.77
7	M3L2	2 Seals	7 Seals	40,000	180,000	13,560	562,500	2.95	.32	.19	.36
8	M3L19	2 Seals	-	40,000	40,000	39,604	39,604	1.01	.32	.06	.36

NOTE: The potential costs above include the known costs.

TABLE 95

Benefication - Recommended Plans
Sub-watershed 3L

Plan	Above Sources Abated	Acid ppd	Acid % of Total Sub-watershed	Iron ppd	Iron % of Total Sub-watershed	Total Construction Costs Flowing Sources	Total Construction Costs Potential Sources
A	1 thru 8	653.01	41.88	135.45	153.08	$241,500	$641,500
B	1 thru 3	622.02	39.89	129.20	146.02	66,500	166,500
C	1 and 2	578.93	37.13	127.74	144.37	40,000	120,000

It is recommended that Plan "C" be initiated for this sub-watershed.

SUB-WATERSHED 2L
(FALLEN TIMBER RUN)

Sub-watershed 2L (Fallen Timber Run)

General Discussion

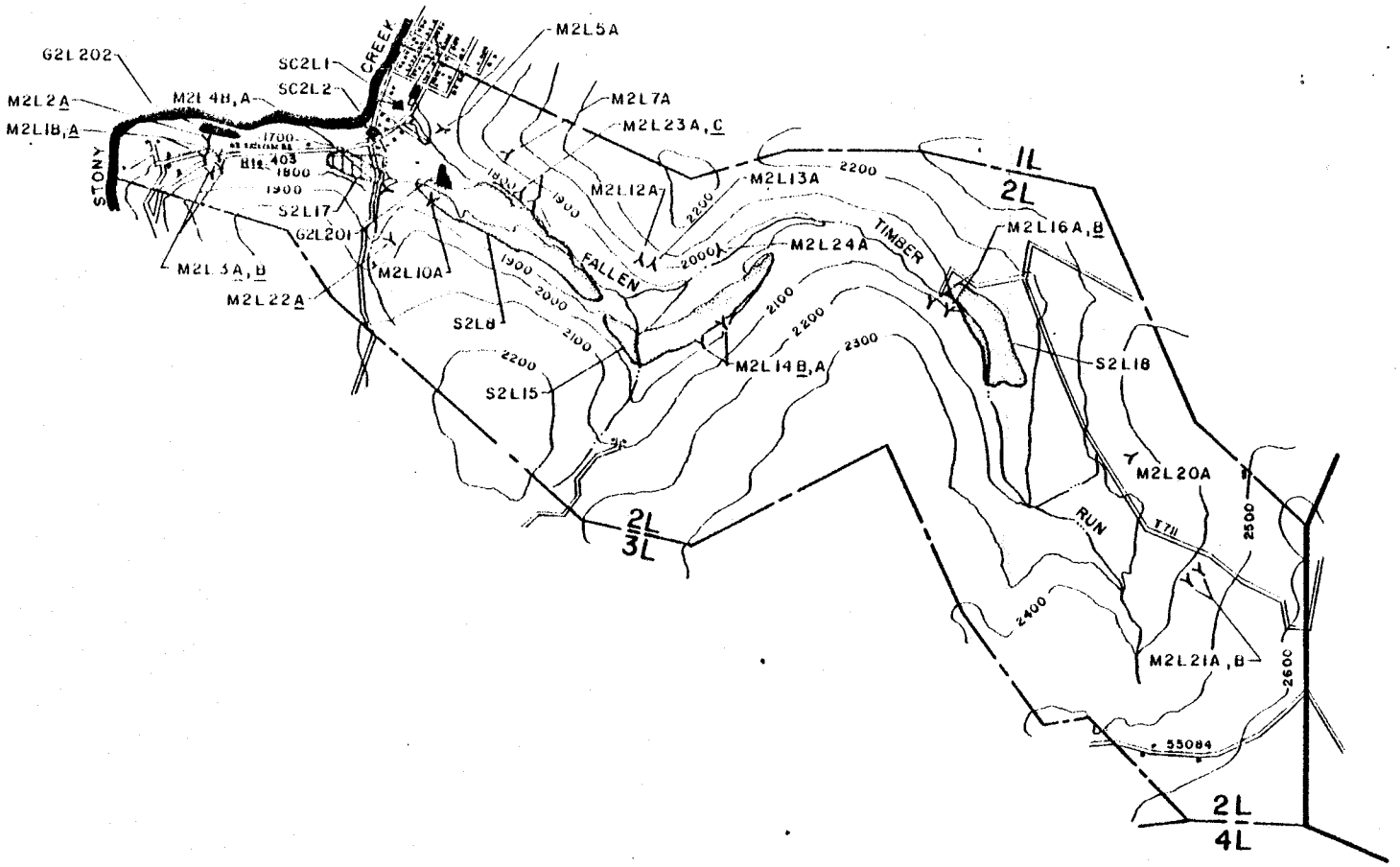
This sub-watershed encompasses 2.9 square miles or 1,837 acres of land which approximately equals 2.06% of the total study area. It is drained by 12.1 miles of tributaries. (5.15% of the total length of all watershed tributaries) and has 1.1 acres of lakes and ponds (.06% of this sub-watershed land area). Commonwealth records show 5 surface and 13 deep mines in the area. Our field investigations locate 4 abandoned strip mines, none of which has a flow. We have also pinpointed 23 deep mine openings, 9 of which are flowing.

The following is a summation of the flows from the two sampling stations located at the mouth of the two major tributaries in this sub-watershed and designated as SC2L1 (Fallen Timber Run) and SC2L2 (unnamed) located on drawing 7119-6. The percentage that these stations contribute in pollution load and flow to the total pollution load and flow as measured at Monitoring Station SC1 on Stony Creek is also included.

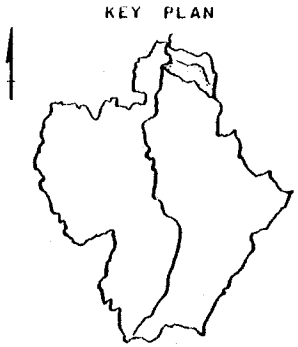
	Averages	Percent of Total Watershed
pH	6.3	
Net Cold Acidity	58.20 PPD	.19%
Net Hot Acidity	0 PPD	-
Ferrous Iron	2.52 PPD	.33%
Total Iron	10.72 PPD	.24%
Sulfate	1,577.22 PPD	.82%
Hardness	3,241.55 PPD	1.57%
Flow	3,337,920 GPD	2.09%

General Discussion (contd.)

The following plate shows the locations of all deep mine openings and strip mines, where they exist, within this sub-watershed, as well as the locations of all sampling stations.



KEY PLAN



MAP OF SUB-WATERSHED 2L

(FALLEN TIMBER RUN)

2000' 0 2000'

SCALE IN FEET

Deep Mines

The Commonwealth records indicate that there are 13 deep mines in this sub-watershed. Our field investigations locate 23 deep mine openings of which 9 are flowing. Table 96 lists the abandoned deep mines within this sub-watershed with the following information: name of mine or operator, if known, available mine maps, acres and seam mined, mine opening designation, openings with flows, estimated elevation of openings, and head in feet which is the difference in coal elevations on an up-dip mine.

Table 97 gives the averages of the abandoned deep mine flows. Directly under the averages are the percentages of flows and pollution loads that each contributes to the pollution load and flow of the sub-watershed as measured at Sampling Station SC2L1 (Fallen Timber Run) and SC2L2. The readings at these two stations are combined to give total pollution values from the sub-watershed. The averages, taken at mine openings, are added together where more than one opening of a mine complex has a flow.

TABLE 96

Abandoned Deep Mines
Sub-watershed 2L

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M2L1	Knickerbocker #3	Yes	371	B	M2L1A	1720'	Yes	560'
				B	M2L1B	1720'	No	
M2L2	(See M2L1)	-	-	B	M2L2A	1710'	Yes	560'
M2L3	Knickerbocker Coal Co.	No	-	C'*	M2L3A	1790'	Yes	150'
				C'*	M2L3B	1790'	Yes	
M2L4	C & M Coal Mining Co.	No	-	B*	M2L4A	1800'	No	-
				B*	M2L4B	1800'	No	
M2L5	Wilber Coal Co.	No	-	B*	M2L5A	1760'	Yes	560'
M2L7	F. Clark	No	-	B*	M2L7A	1930'	No	-
M2L10	Milton Johnson	No	-	B*	M2L10A	1840'	No	-
M2L12	O. B. Coleman	No	-	E*	M2L12A	2000'	No	-
M2L13	L. H. Putnam & T. E. Snyder	No	-	E*	M2L13A	2000'	No	-
M2L14	Wilber Coal Co.	No	-	C'*	M2L14A	2000'	No	150'
				C'*	M2L14B	2000'	Yes	
M2L16	Unknown	No	-	C'*	M2L16A	2100'	No	50'
				C'*	M2L16B	2100'	Yes	
M2L20	Unknown	No	-	E*	M2L20A	2360'	No	-

TABLE 96 (Contd.)

Abandoned Deep Mines
Sub-watershed 2L

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M2L21	Thos. Couperthwaite	No	-	E*	M2L21A	2430'	No	-
				E*	M2L21B	2430'	No	-
M2L22	Unknown	No	-	E*	M2L22A	1970'	Yes	50'
M2L23	Unknown	No	-	E*	M2L23A	1800'	No	25'
				E*	M2L23C	1800'	Yes	
M2L24	Unknown	No	-	C'*	M2L24A	2000'	No	-

*Indicates assumed.

✓Possible connection with Strip Mine S2L15.

→Possible connection with Strip Mine S2L18.

TABLE 97

Abandoned Deep Mine Average Water Quality Data

Sub-watershed 2L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
M2L1	7.3	0	*	0	.01	1.29	130.00	2,880
		-	-	-	.1%	.1%	4%	.1%
M2L2	3.2	889.00	245.00	1.70	46.35	1,201.00	1,209.00	416,160
		1,527.5%	-	67.5%	432.4%	76.2%	37.3%	12.5%
M2L3	7.3	0	*	.34	.18	43.55	72.88	25,920
		-	-	13.5%	1.7%	2.8%	2.3%	.8%
M2L5	4.5	.40	1.13	.38	2.85	9.60	4.13	2,880
		.7%	-	15.1%	26.6%	.6%	.1%	.1%
M2L14	3.5	95.36	72.79	.80	4.79	519.09	347.09	168,480
		163.9%	-	31.8%	44.7%	32.9%	10.7%	5.1%
M2L16	6.2	0	*	0	.01	.58	.60	2,880
		-		-	.1%	-	-	.1%
M2L22	6.9	0	*	.09	.18	16.15	32.27	84,960
		-		3.6%	1.7%	1%	1%	2.6%
M2L23	4.9	.12	3.56	.26	.68	3.15	11.42	1,440
		.2%	-	10.3%	6.3%	.2%	.4%	-

*Not analyzed.

Strip Mines

The Commonwealth records indicate that there are 5 strip mines in this sub-watershed. Our field investigations locate 4 surface mines with none flowing. Table 98 lists the abandoned strip mines within the sub-watershed with the following information: the name of the mine or operator, if known, the area and seam mined, the designation we give the mine, whether or not there is a flow, and whether it connects with a deep mine.

The total acreage of abandoned surface mines in subwatershed 2L is 78.95 acres (4.30% of this sub-watershed area).

TABLE 98

Abandoned Surf ace Mines

Sub-watershed 2L

Mine Number	Name of Mine or Operator	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S2L8	Lebor Coal Co.	33.05	B	No	No
S2L15	Alumbaugh Coal Co.	22.95	E,C',B	No	M2L14
S2L17	Harold E. Goden	7.34	B	No	No
S2L18	Thermal Coal Mining Co.	15.61	B	No	M2L16

Recommendations

Table 99 gives the recommendations for the polluting deep mines along with the costs associated with each recommendation.

An estimated effectiveness of 60% reduction of pollution load is assigned for each recommendation.

Table 100 lists the sources abated, the amount of benefication and the costs associated with each plan.

The distance from Station SC2L2, Fallen Timber Run, to the next polluting tributary downstream, SC1L2 (Dixie Run), is .40 mile. This is the minimum distance Stony Creek would benefit by having this sub-watershed cleaned up.

TABLE 99

Recommended Abatement Procedures - Cost Benefication

Sub-watershed 2L

Rank	Number	Recommended Abatement		Total Costs		Cost, $/Pound Acid Removal		Total Acid Abatement ppd	Total Iron Abatement ppd	Percent of Total Sub-watershed	
		Known Sources	Potential Sources	Known Sources	Potential Sources	Known Sources	Potential Sources			Acid	Iron
1	M2L2	1 Seal	3 Seals 1 A.S.	$20,000	$88,000	$ 38	$ 165	533.40	27.81	916.49	259.42
2	M2L14	2 Seals	-	50,000	50,000	874	874	57.22	2.87	98.32	26.77
3	M2L5	1 Seal	-	20,000	20,000	83,334	83,334	.24	1.71	.41	15.95
4	M2L23	2 Seals	-	25,000	25,000	357,143	357,143	.07	.89	.12	17.63

TABLE 100

Benefication - Recommended Plans
Sub-watershed 2L

Plan	Above Sources Abated	Acid ppd	Acid % of Total Sub-watershed	Iron ppd	Iron % of Total Sub-watershed	Total Construction Costs Flowing Sources	Total Construction Costs Potential Sources
A	1 thru 4	590	1014%	34	317%	$115,000	$183,000
B	1 and 2	590	1014%	31	289%	70,000	138,000
C	1	533	916%	28	261%	20,000	88,000

It is recommended that Plan "C" be initiated for this sub-watershed.