SUB-WATERSHED 15L

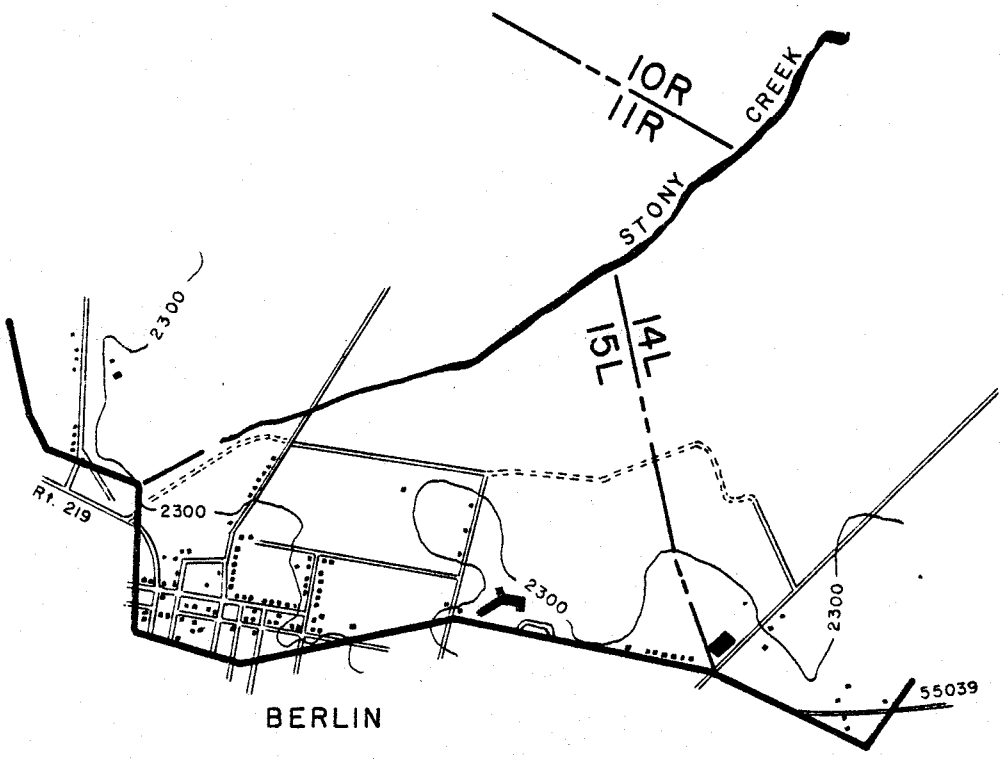
(HEADWATERS)

Sub-watershed 15L (Headwaters)

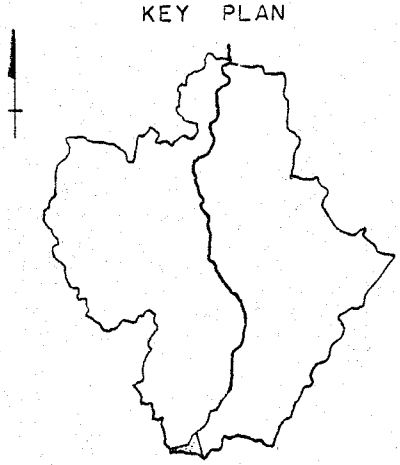
General Discussion

This sub-watershed encompasses ½ square mile or 331 acres of land area. This is .38% of the total study area. The headwaters of Stony Creek have their origin in this sub-watershed. The Commonwealth records indicate four (4) surface mines and no deep mines in the area. Our field investigation indicates that the strip mines have been reclaimed with little or no leaching and that no evidence of extensive deep mining is present.

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 location of all sampling stations.



KEY PLAN



MAP OF SUB-WATERSHED 15 L

(UN-NAMED)

SCALE: 1"=2000'

SUB-WATERSHED 11R

(UN-NAMED)

Sub-watershed 11R (unnamed)

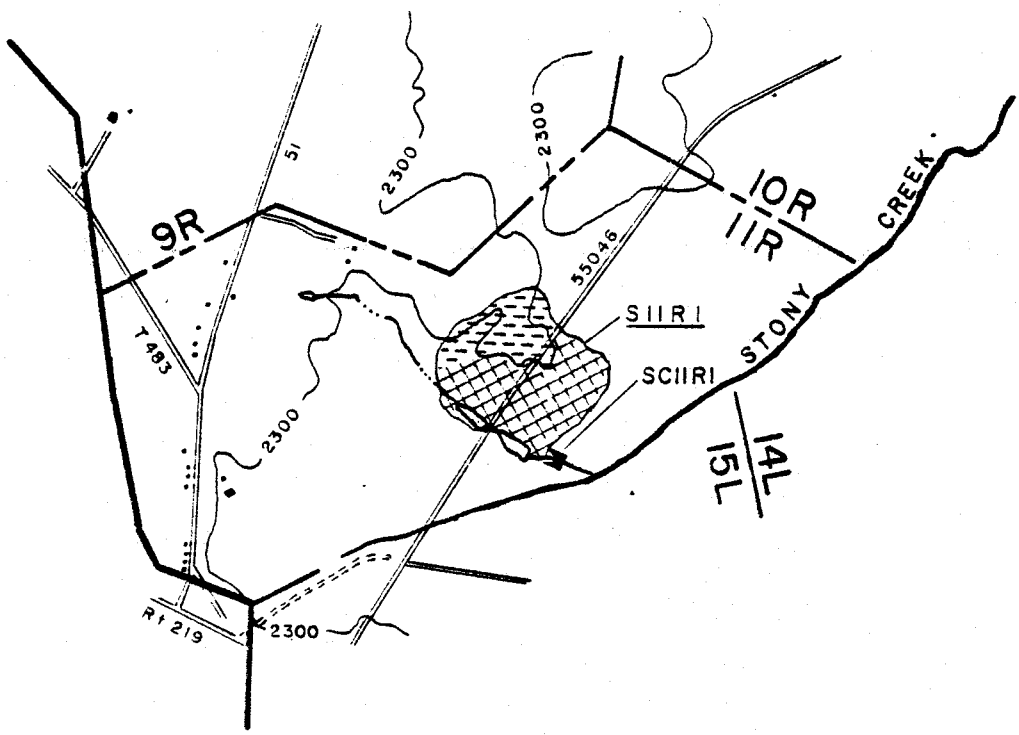
General Discussion

This sub-watershed encompasses seven tenths of a square mile or 452 acres of land area, approximately .51% of the total study area. It is drained by eight tenths of a mile of tributaries (.34% of the total length of all tributaries within the study area) and has 4.8 acres of lakes and ponds (1.06% of the sub-watershed land area). The Commonwealth records indicate that there is one strip mine and two deep mines in this small drainage basin. Our field investigations have found the reclaimed strip mine, but no evidence of deep mines. It is believed that the deep mines were covered over during the reclamation of the surface mine.

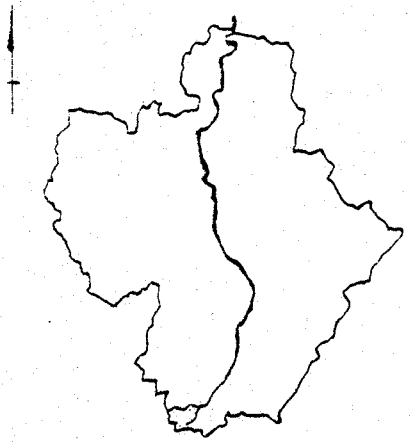
The following information gives the averages of the sampling station designated as SC11R1, located at the mouth of this unnamed tributary and shown on drawing 7119-6. The percentages that this station contributes in pollution load and flow to the total pollution load and flow as measured at Monitoring Station SC1 is also included.

	Averages	Percent of Total Watershed
pH	6.4	
Net Cold Acidity	0 PPD	0%
Net Hot Acidity	0 PPD	0%
Ferrous Iron	.33 PPD	.04%
Total Iron	5.4 PPD	.12%
Sulfates	333.4 PPD	.17%
Hardness	608.70 PPD	.30%
Flow	226,080 GPD	.14%

The following plate shows the location of all deep mine openings and strip mines where they exist within this subwatershed as well as the location of all sampling stations.



KEY PLAN



MAP OF SUB-WATERSHED 11.8

(UN-NAMED)

SCALE: 1" = 2000'

Strip Mines

The Commonwealth records indicate that there is one strip mine in this sub-watershed. Our field investigations have located this surface mine with two flows. Table 9 lists the abandoned strip mine 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 the abandoned surface mine in subwatershed 11R is 47.74 acres. (10.56% of the sub-watershed area).

Table 10 gives the averages of the flows of this surface mine. Directly under the averages are the percentages of flows and pollution load that this mine contributes to the pollution load of the sub-watershed as measured at Sampling Station SC11R1. Where a single surface mine has more than one flow, the averages of the flows are added together.

Following Table 10 is the description of the flowing strip mine along with abatement recommendations.

TABLE 9

Abandoned Surface Mines

Sub-watershed 11R

Mine Number	Name of Mine or Operator	Area Mined (Acres)	Seam Mined	Flow-ing	Connection w/Deep Mine
S11R1	Zubek & Yankus	47.74	Pitts-burgh	Yes	Possible

TABLE 10

Abandoned Surface Mine Average Water Quality Data

Sub-watershed 11R

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
S11R1	6.0	1.09	*	.97	4.84	11.87	*	4,320
		109%		293.9%	89.6%	35.54%		1.9%

Strip Mine: S11R1

Area: 47.74 acres

Location: N.W. of Stony Creek and intersected by L.R. 55046

Status: Partly active and partly reclaimed

Owned by: Zubek and Yankus

Seam mined: Pittsburgh

Connection with deep mine: Possible

Flowing: Two leaching areas

General Description:

Surface flows found on this strip mine are creating ponds. These flows are probably eminating from the active mine to the north. Otherwise the mined area is relatively flat and revegetated with grasses and corn.

Recommendation:

Until the active portion of this mine is reclaimed and reinvestigation of the flows, if any, are completed there is no recommendation.

SUB-WATERSHED 14L

(UN-NAMED)

Sub-watershed 14L (unnamed)

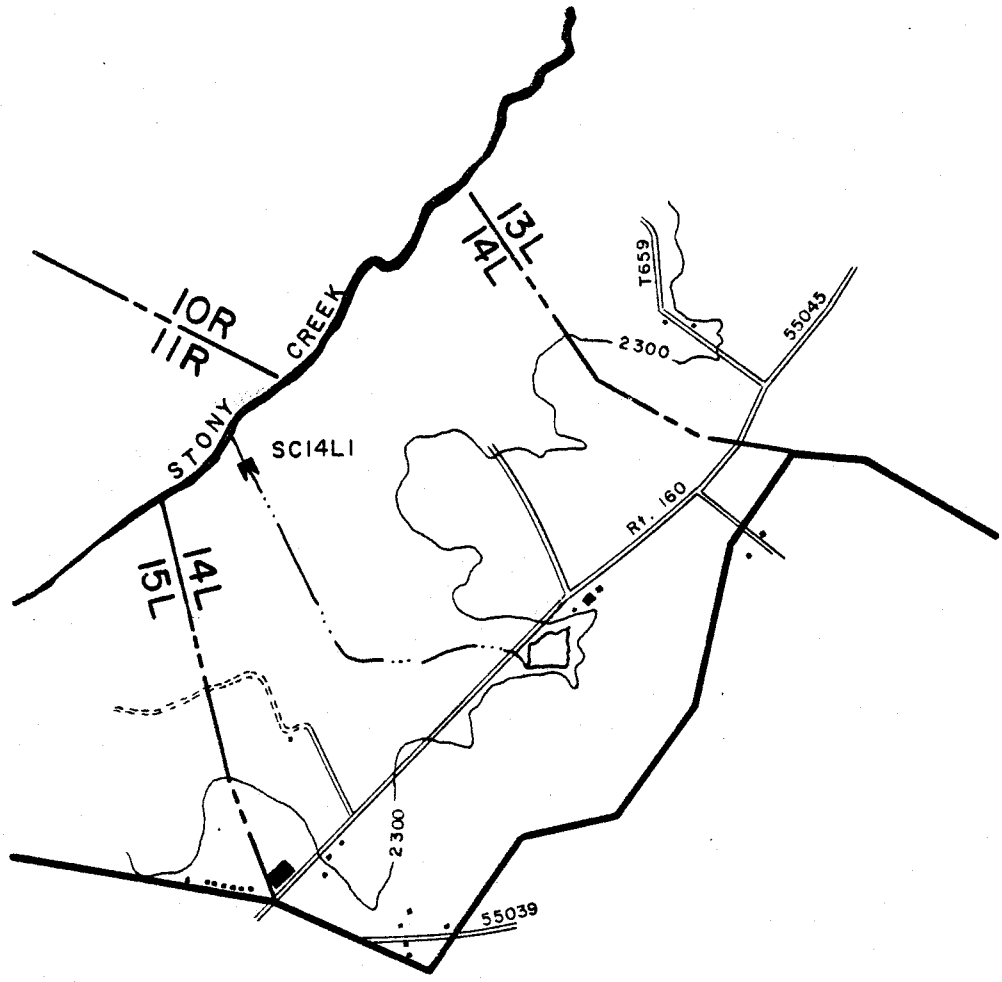
General Discussion

This sub-watershed encompasses one (1) square mile or six hundred and fifty four (654) acres of land area, which is approximately .73% of the total study area. It is drained by nine tenths (.9) of a mile of tributaries (.39%) of the total length of all watershed tributaries) and has three and seven-tenths (3.7) acres of lakes and ponds (.57% of the sub-watershed area). Our field investigation finds three (3) surface mines, reclaimed and with little or no leaching. No deep mines are found in this sub-watershed.

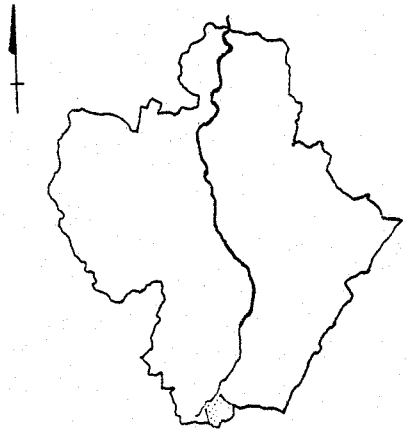
The following information gives the averages of the sampling station designated as SC14L1, located at the mouth of the unnamed tributary and shown on drawing 7119-6. The percentage that this station contributes in pollution load and flow to the total pollution load as measured at Monitoring Station SC1 on Stony Creek is also included.

	Averages	Percent of Total Watershed
pH	6.5	
Net Cold Acidity	0 PPD	0%
Net Hot Acidity	0 PPD	0%
Ferrous Iron	11.66 PPD	1.52%
Total Iron	25.24 PPD	.56%
Sulfate	465.30 PPD	.24%
Hardness	1,768 PPD	.86%
Flow	1,337,760 GPD	.84%

The following plate shows the location of all deep mine openings and strip mines where they exist within this subwatershed as well as the location of all sampling stations.



KEY PLAN



MAP OF SUB-WATERSHED 14L

(UN-NAMED)

SCALE: 1"=2000'

SUB-WATERSHED 10R

(UN-NAMED)

Sub-watershed 10R (unnamed)

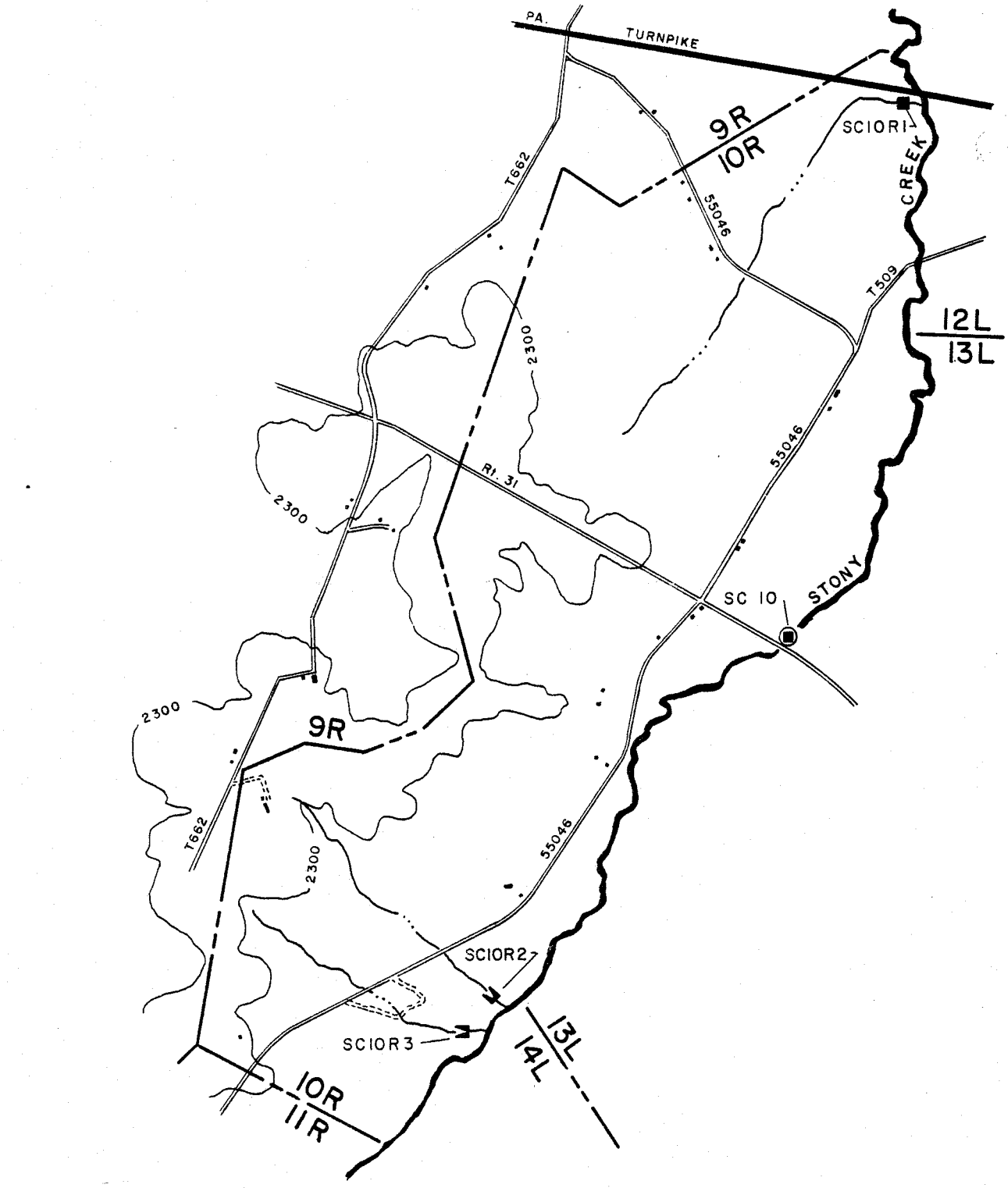
General Discussion

This sub-watershed encompasses 2.3 square miles or 1,469 acres of land (approximately 1.65% of the total study area). It is drained by three tributaries totaling 2.5 miles which is 1.06% of the total watershed tributaries. Commonwealth records indicate that no mining, deep or surface, has occurred in this area and our field investigations substantiate this.

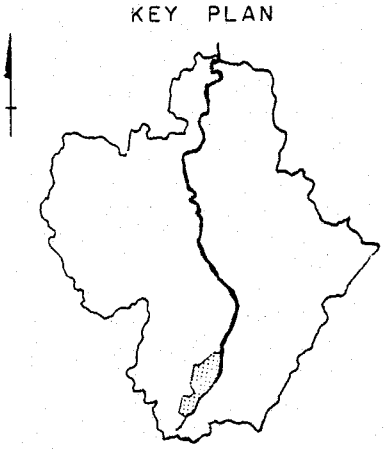
The following is a summation of the flows from the three major unnamed tributaries, SC10R1, SC10R2, and SC10R3 and located on drawing 7119-6. The percentage that these stations contribute in pollution load and flow to the total pollution load and flow, as measured at Monitoring Station SC1 on Stony Creek, is also included.

	Averages	Percent of Total Watershed
pH	6.7	
Net Cold Acidity	0 PPD	0%
Net Hot Acidity	0 PPD	0%
Ferrous Iron	14.00 PPD	1.83%
Total Iron	38.39 PPD	.86%
Sulfate	540.23 PPD	.28%
Hardness	1,502.42 PPD	.73%
Flow	2,151,360 GPD	1.35%

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



KEY PLAN



MAP OF SUB-WATERSHED 10P

(UN-NAMED)

SCALE: 1"=2000'

SUB-WATERSHED 13L

(REITZ CREEK)

Sub-watershed 13L (Reitz Creek)

General Discussion

This sub-watershed encompasses 5.9 square miles or 3,791 acres of land area (approximately 4.26% of the total study area). It is drained by 9.7 miles of tributaries (4.13% of total length of watershed tributaries), and has 6.3 acres of lakes and ponds (.17% of sub-watershed area). Commonwealth records indicate 9 surface mines and 4 deep mines in this area. Our field investigation found 5 surface mines, 2 of which are flowing, encompassing approximately 132 acres. We also find 7 deep mine openings, 3 of which are flowing.

The following is a summation of the flows from the two major tributaries in this sub-watershed, Reitz Creek (SC13L1) and an unnamed tributary (SC13L2) located on drawing 7119-6. The percentage that these stations contributes in pollution load and flow to the total pollution load and flow as measured at Monitoring Station SC1 on Stony Creek is also included.

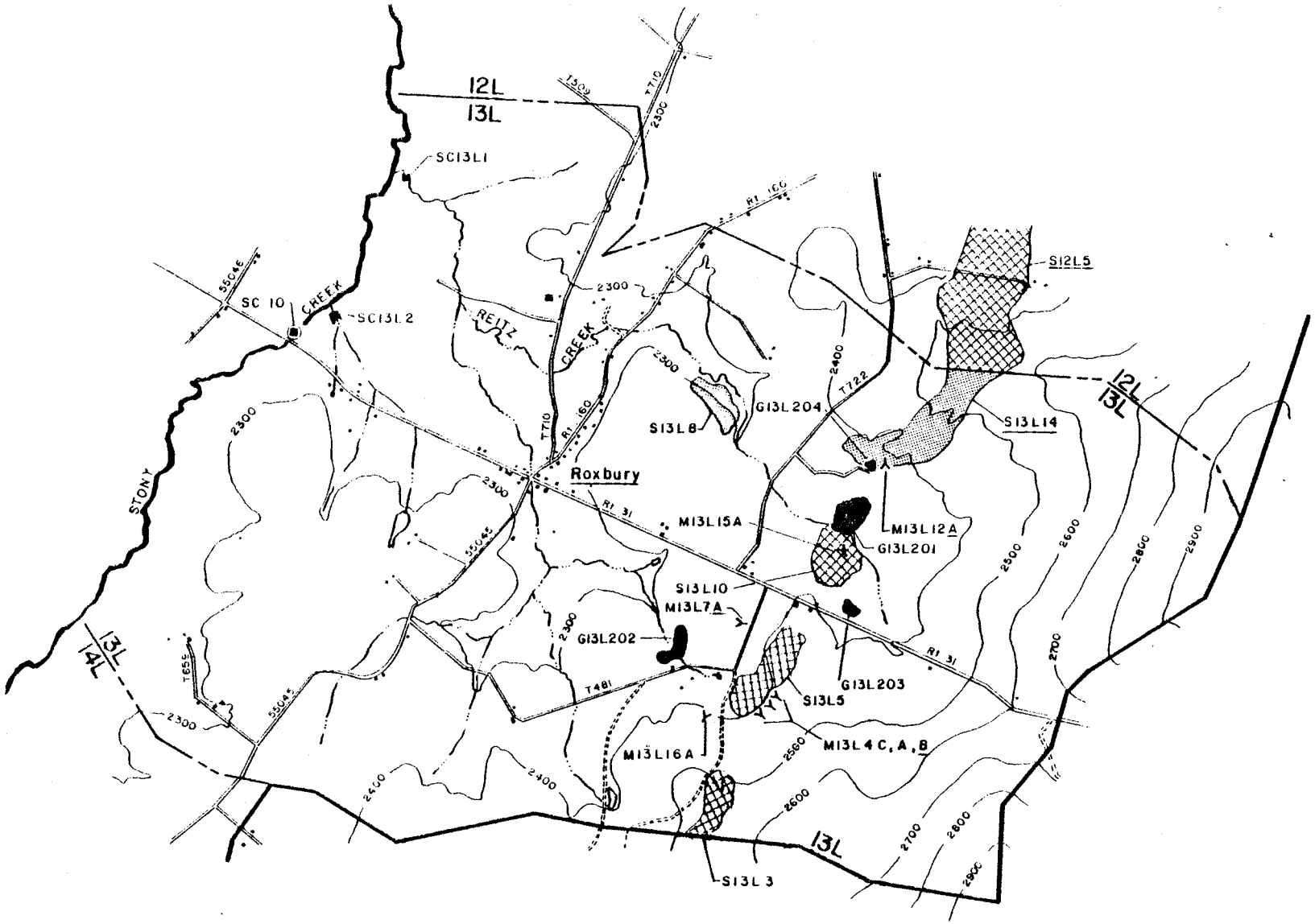
	Averages	Percent of Total Watershed
pH	5.5	
Net Cold Acidity	1,099.42 PPD	3.52%
Net Hot Acidity	715.36 PPD	.66%
Ferrous Iron	34.74 PPD	4.53%
Total Iron	103.94 PPD	2.33%
Sulfates	3,289.90 PPD	1.71%
Hardness	4,480.80 PPD	2.18%
Flow	7,441,920 GPD	4.66%

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

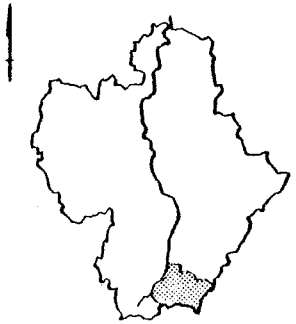
Deep Mines

The Commonwealth records indicate that there are four (4) deep mines in this sub-watershed. Our field investigations locate seven (7) deep mine openings of which three (3) are flowing. Table 11 lists the abandoned deep mines within the sub-watershed with the following information: the name of the mine or operator if known, available mine maps, acres and seam mine, mine opening designation, openings with flows, the estimated elevation of the opening and head in feet, which is the difference in coal elevations on an up-dip mine.

Table 12 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 of the sub-watershed as measured at Sampling Station SC13L1 and Station SC13L2. The readings at these two stations are combined to give total pollution from this sub-watershed. The averages, taken at the mine openings, are added together where more than one opening of a mine complex has a flow.



KEY PLAN



MAP OF SUB-WATERSHED 13L (REITZ CREEK)

2000' 0 2000'

SCALE IN FEET

TABLE 11

Abandoned Deep Mines

Sub-watershed 13L

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M13L4	H. E. Scurfield Coal Co.	No	-	B*	M13L4A	2410'	No	150*
				B*	M13L4B	2410'	Yes	
				B*	M13L4C	2410'	No	
M13L7	Carner Coal Co.	No	-	C'*	M13L7A	2380'	Yes	50*
**M13L12	Shipley Mine #1	Yes	94.5	C'	M13L12A	2380'	Yes	120
M13L15	Unknown	No	-	B*	M13L15A	2340'	No	
M13L16	Unknown	No	-	C'*	M13L16A	2410'	No	

* Indicates assumed.

**Possible interconnection with strip mine S13L10.

TABLE 12

Abandoned Deep Mine Average Water Quality Data

Sub-watershed 13L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
M13L4	4.9	1.64	-	.01	.04	1.75	1.05	17,280
		.2%	-	-	-	.1%	-	.2%
M13L7	3.2	1,333.00	732.09	211.86	605.93	2,062.00	1,855.00	345,600
		121.2%	102.3%	609.8%	583%	62.7%	41.4%	4.6%
M13L12	5.3	.67	1.18	.01	.05	6.18	7.97	8,640
		.1%	.2%	-	.1%	.2%	.2	.1%

Strip Mines

The Commonwealth records indicate that there are nine (9) strip mines in this sub-watershed. Our field investigations locate five (5) surface mines with two (2) flowing. Table 13 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 13L is 132.2 acres (3.49% of sub-watershed area).

Table 14 gives the averages of the abandoned surface mine flows. Directly under the averages are the percentages of flows and pollution load that each mine contributes to the pollution load of the sub-watershed as measured at Sampling Stations SC13L1 and SC13L2.

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

Following Table 14 is the description of the flowing strip mines along with abatement recommendations.

TABLE 13

Abandoned Surface Mines

Sub-watershed 13L

Mine Number	Name of Mine or Operator	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S13L3	Emmett Duppstadt	22.03	D,C'	No	No
S13L5	Kenneth E. Reed	18.36	C'	No	No
S13L8	Thermal C. M. Co.	11.01	E,D,C'	No	No
S13L10	Carver Brothers	44.07	B	Yes	M13L12
S13L14	Unknown	36.73	C'	Yes	No

TABLE 14

Abandoned Surface Mine Average Water Quality Data

Sub-watershed 13L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
S13L10	3.3	359	3,925	115	206	1,306	6,279	224,640
		33%	549%	331%	198%	40%	140%	3%
S13L14	3.6	517	625	36	154	1,076	577	131,040
		47%	87%	104%	148%	33%	13%	2%

Strip Mine: S13L10

Area: 44.07 acres

Location: SE of Rt. T722

Status: Reclaimed

Owned by: Carver Brothers

Seam mined: B

Connection with Deep mine: M13L12

Flowing: Three leaching areas

General Description:

Medium vegetation is on this strip. Leaching and erosion only occurs toward the gob pile.

Recommendation:

No revegetation and little grading is necessary. Requires drainage ditches and possibly a small amount of backfill which would have to be brought in to fill erosion ditches.

Cost:

Ditch	8000'	$8,000
Clear and grubbing		1,000
	Total	$9,000

Strip Mine: S13L14

Area: 36.73 acres

Location: East of Rt. T722

Status: Abandoned

Owned by: Unknown

Seam mined: C'

Connection with deep mine: None

Flowing: Five leaching or drainage areas

General Description:

Only sparse grassy areas exist on this strip. Depressions have gathered water toward the east side and at the base of the 25' to 30' high highwall on the west side. The gob pile slopes towards the highwall.

Recommendation:

Complete reclamation.

Cost:

Ditches	5000'	$ 5,000
Grading 20 acres @ $1800/acre		36,000
Backfilling		3,000
Revegetation 37 acres		24,000
	Total	$68,000

Recommendations

Table 15 gives recommendations for the polluting deep and surface mines. Table 16 lists the sources abated, the amount of benefication and the cost associated with each plan recommended.

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

The distance from Reitz Creek, Station SC12L1, to the next polluting tributary down steam, Station SC8R2, is 2.25 miles. This is the minimum distance on Stony Creek that would benefit from Reitz Creek becoming a clean stream.

TABLE 15

Recommended Abatement Procedures - Cost Benefication

Sub-watershed 13L

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 S13L10	44.07 Acres of Strip Mine Reclamation	2 Seals	$ 9,000	$49,000	$ 25.07	$ 136.49	359	124	33	119
2 M13L7	1 Seal	-	25,000	25,000	32.05	32.05	780	364	71	350
3 S13L14	36.73 Acres of Strip Mine Reclamation	-	68,000	68,000	219.35	219.35	310	93	28	89
4 M13L12	1 Seal	1 Seal & 44 Acres of Strip Mine	20,000	40,000	20,000	40,000	1	<1	-	1
5 M13L4	4 Seals	-	75,000	75,000	75,000	75,000	1	<1	-	1

Note: The potential costs above include known costs.

TABLE 16

Benefication - Recommended Plans

Sub-watershed 13L

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 5	1,451	132	583	561	$197,000	$257,000
B	1 thru 3	1,449	132	581	559	102,000	142,000
C	1 & 2	1,139	104	488	469	34,000	74,000

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