

SUB-WATERSHED 12L
(DOWNEY RUN)

Sub-watershed 12L (Downey Run)

General Discussion

This sub-watershed encompasses 6 square miles or 3,838 acres. This is 4.31% of the total study area. It is drained by 5.9 miles of tributaries (2.54% of the total length of all watershed tributaries) and contains 9.1 acres of ponds and lakes (.24% of the sub-watershed area).

Commonwealth records indicate 7 surface and 2 deep mines in the area. Our field investigations found 3 surface mines, none of which have flows. We have also found one deep mine which has a flow.

The following is a summation of the flows from the two major tributaries in this sub-watershed, Downey Run (SC12L2) and an unnamed tributary (SC12L1) 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.

	<u>Averages</u>	<u>Percent of Total Watershed</u>
pH	6.3	
Net Cold Acidity	0 PPD	0%
Net Hot Acidity	6,785.42 PPD	6.25%
Ferrous Iron	10.05 PPD	1.31%
Total Iron	133.09 PPD	2.98%
Sulfate	5,938.50 PPD	3.08%
Hardness	6,756 PPD	3.28%
Flow	4,952,160 GPD	3.10%

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.

Deep Mines

The Commonwealth records indicate that there are 2 deep mines in this sub-watershed. Our field investigations have located one deep mine opening and it is flowing. Table 17 lists the abandoned deep mine within the 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, the estimated elevation of the opening and head in feet, which is the difference in coal elevations on an up-dip mine.

Table 18 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 SC12L1 and Sampling Station SC12L2. The readings at these two stations are combined to give total pollution values from this sub-watershed. The averages, taken at mine openings, are added together where more than one opening of a mine complex has a flow.

MAP OF SUB-WATERSHED 12L (DOWNEY RUN)

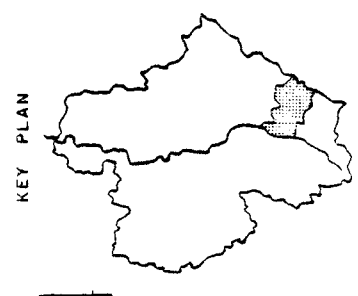
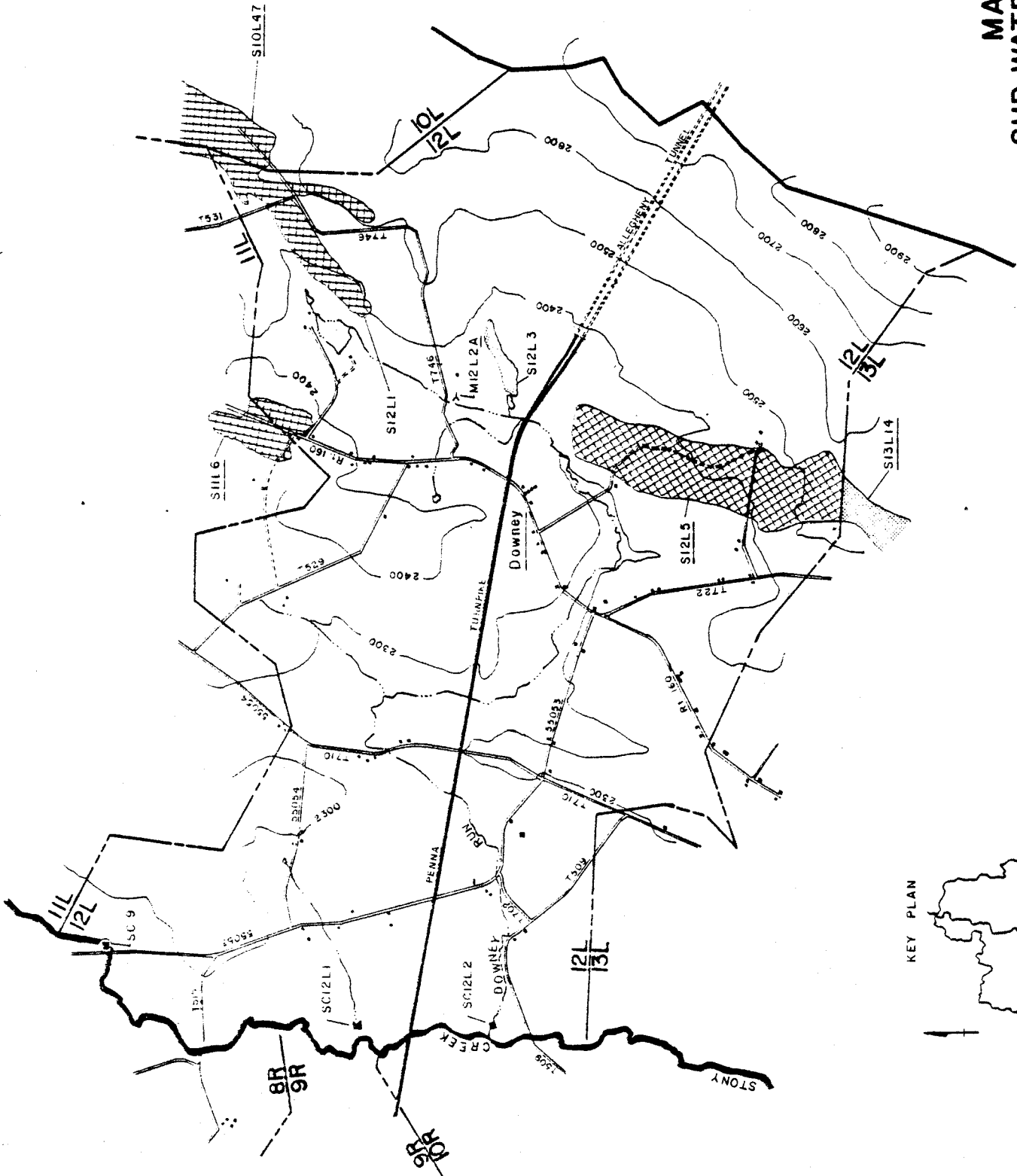


TABLE 17

Abandoned Deep Mines

Sub-watershed 12L

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M12L2	Burk Mine	no	-	c'*	M12L2A	2320'	Yes	100*

*Indicates assumed.

TABLE 18

Abandoned Deep Mine Average Water Quality Data

Sub-watershed 12L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
M12L2	4.3	71.05	146.69	35.71	42.59	381.55	413.88	48,960
			2.2%	355.3%	32%	6.4%	6.1%	1.0%

Strip Mines

The Commonwealth records indicate that there are 7 strip mines in this sub-watershed. Our field investigations have located 3 surface mines with 2 flowing. Table 19 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 12L is 204.71 acres (5.33 of the sub-watershed area).

Table 20 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 SC12L1 and SC1212.

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

Following Table 20 is the description of the flowing strip mines along with abatement recommendations.

TABLE 19
Abandoned Surface Mines
Sub-watershed 12L

Mine Number	Name of Mine or Operator	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S12L1	P.B.S. Coals Inc.	58.75	D,C'	Yes	No
S12L3	Paul Coleman	8.26	D	No	No
S12L5	Dunlo Coal Co. Emmett Dupstadt Svonavec Inc.	137.70	E,D,C' C' D,C',B	Yes	No

TABLE 20

Abandoned Surface Mine Average Water Quality Data

Sub-watershed 12L

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
S12L1	7.1	-	*	.13	.33	186.21	*	21,600
		-	-	1.3%	.3%	3.2%	-	.4%
S12L5	3.4	110.86	*	1.42	6.52	377.89	*	53,280
			-	14.1%	4.9%	6.4%	-	1.1%

* Not analyzed.

Strip Mine: S12L1

Area: 58.75 acres

Location: Intersected by Rts. T 531 and T 746.

Status: Reclaimed

Owned by P.B.S. Coals Inc.

Seams mined: C' and D

Connection with deep mine: None

Flowing: One leaching area

General Description:

Most of this strip is revegetated in grain, however slight erosion occurs.

Recommendation:

The flow from this strip is below required pollution levels therefore no action is required.

Strip Mine: S12L5

Area: 137.70 acres

Location: South of Pa. Turnpike and East of Rt. 722

Status: Reclaimed

Owned by: Dunlo Coal Co.

Seam mined: C'

Connection with deep mine: None

Flowing: Four leaching areas

General Description:

The southern half of the strip has drainage ditch and is planted with grasses and small pines. The northern half receives the drainage from the south creating leaching and erosion and a swampy area toward the northwest.

Recommendation:

Additional drainage ditches and revegetation. Investigate deep mine possibilities in this area.

Cost:

Ditch	8000'	\$ 8,000
Revegetate 15 acres		<u>9,000</u>
Total		\$17,000

Recommendations

Table 21 gives the recommended abatement procedures with cost benefication for all polluting deep or surface mines. Table 22 lists the sources abated, the amount of benefication and the costs associated with each recommendation.

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

Although Downey-Run, Station SC12L2, is not considered a polluted stream, it has experienced fish kills due to mine acid slugging.

TABLE 21

Recommended Abatement Procedures - Cost Benefication
Sub-watershed 12L

Number	<u>Recommended Abatement</u>		<u>Total Costs</u>		<u>Cost \$/Pound Acid Removal</u>		Total Acid Abate-ment ppd	Total Iron Abate-ment ppd	<u>Percent of Total Sub-watershed</u>	
	Known Sources	Poten- tial Sources	Known Sources	Poten- tial Sources	Known Sources	Poten- tial Sources			Acid	Iron
1 S12L5	137.70 acres of strip mine	-	\$17,000	\$17,000	\$253.73	\$253.73	67	4	-	3
2 M12L2	1 Seal	-	\$25,000	\$25,000	\$581.40	\$581.40	43	26	-	20

Note: The potential costs above include known costs.

TABLE 22

Benefication - Recommended Plans

Sub-watershed 12L

Plan	Above Sources Abated	<u>Acid</u>		<u>Iron</u>		<u>Total Construction Costs</u>	
		ppd	% of Total Sub-water- shed	ppd	% of Total Sub-water- shed	Flowing Sources	Potential Sources
A	1 & 2	110		30	23	\$42,000	\$42,000
B	1	67		4	3	17,000	17,000

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

SUB-WATERSHED 9R

(UN-NAMED)

Sub-watershed 9R (Glades Creek)

General Discussion

This sub-watershed encompasses 10.3 square miles or 6,574 acres, which is 7.39% of the total study area. It is drained by 19.2 miles of tributaries (8.17% of the total length of all watershed tributaries) and contains 6 acres of ponds and lakes (.09% of the sub-watershed area). Commonwealth records indicate 13 strip mines, and 11 deep mines in this area. Our field investigations found 5 surface mines, 3 of which have flows. We also found 13 deep mines, 3 of which have flows.

The following information gives the averages of the sampling station designated as SC9R1, located at the mouth of Glades Creek and shown on drawing 7119-6. The percentage that this station 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.

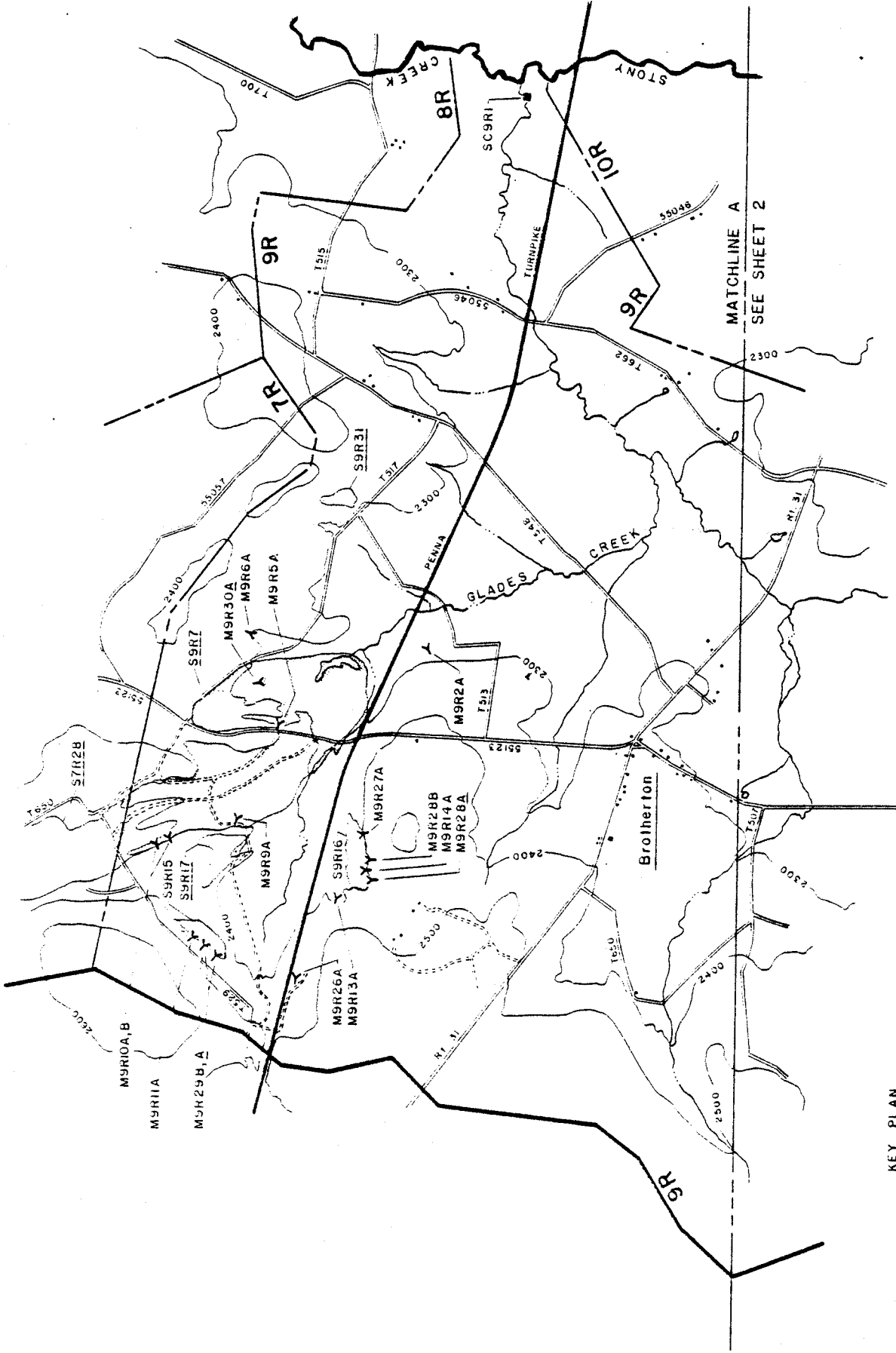
	<u>Averages</u>	<u>Percent of Total Watershed</u>
pH	6.6	
Net Cold Acidity	0 PPD	0 %
Net Hot Acidity	0 PPD	0 %
Ferrous Iron	15.38 PPD	2.01 %
Total Iron	59.28 PPD	1.33 %
Sulfate	5,250 PPD	2.73 %
Hardness	6,702 PPD	3.26 %
Flow	14,499,360 GPD	9.08 %

The following plates show 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.

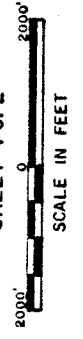
Deep Mines

The Commonwealth records indicate that there are 11 deep mines in this sub-watershed. Our field investigations have located 16 deep mine openings of which 3 are flowing. Table 23 lists the abandoned deep mines within the 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, the estimated elevation of the openings and head in feet, which is the difference in coal elevations on an up-dip mine.

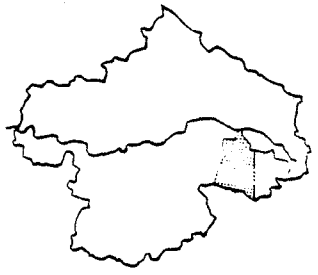
Table 24 gives the averages of the abandoned deep mine flows. Directly under the averages are the percentages of flows and pollution loads that each contributes to the pollution load of the sub-watershed as measured at Sampling Station SC9R1, Glades Creek. The averages, taken at the mine openings, are added together where more than one opening of a mine complex has a flow.

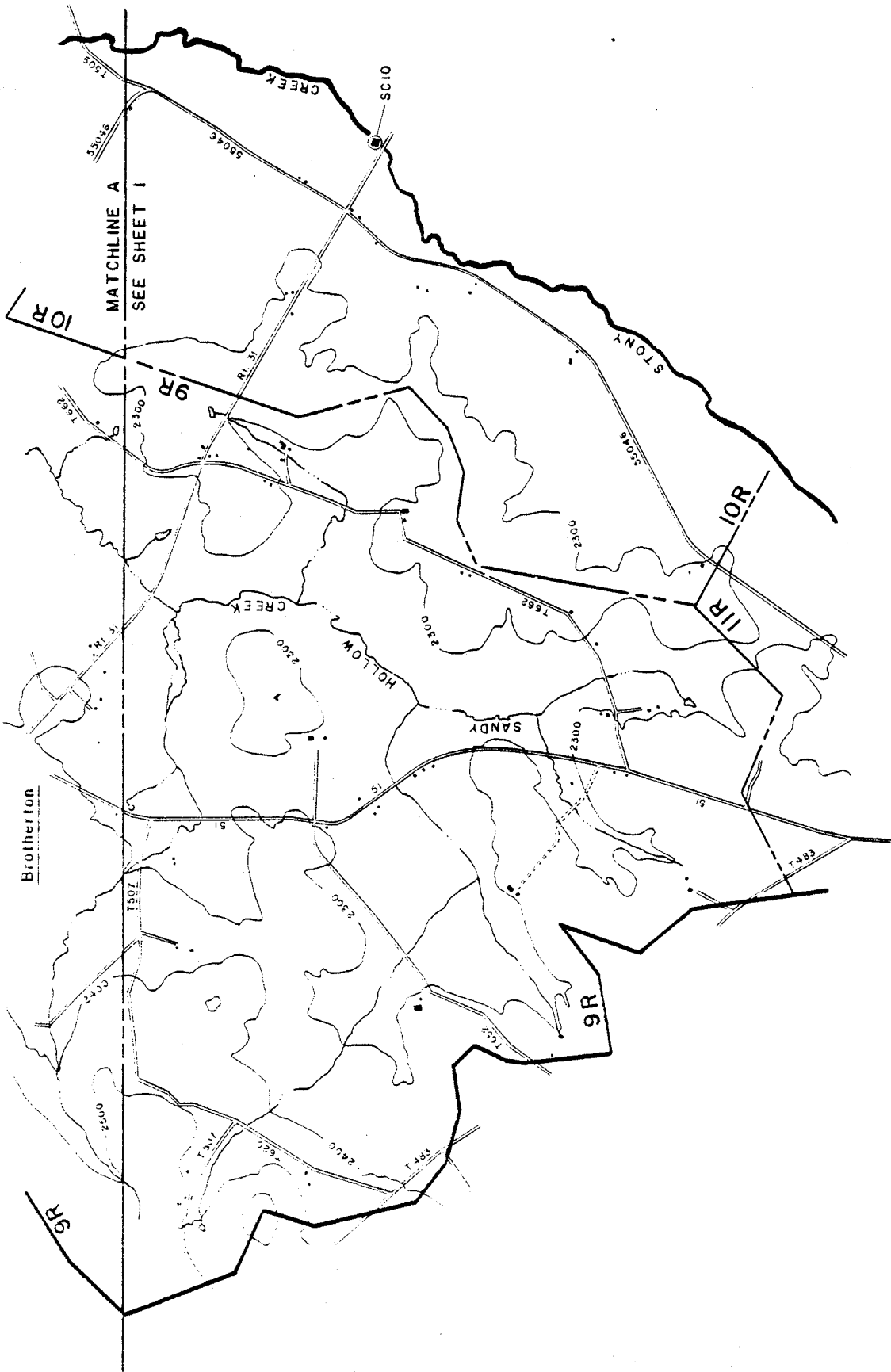


**MAP OF
SUB-WATERSHED 9R**
(UN-NAMED)
SHEET 1 of 2



KEY PLAN





**MAP OF
SUB-WATERSHED 9R**
(UN-NAMED)
SHEET 2 of 2

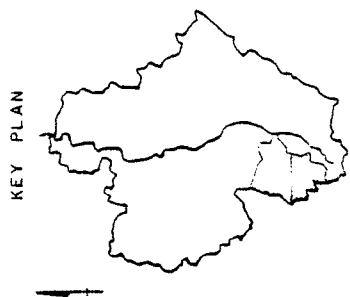


TABLE 23

Abandoned Deep Mines
Sub-watershed 9R

Mine Number	Name of Mine or Operator	Mine Map Obtained	Area Mined (Acres)	Seam Mined	Mine Opening No.	Elev. of Opening	Flow	Head (Feet)
M9R2	Denise Coal Co.	No	-	E	M9R2A	2280'	No	-
↗M9R5	Rice & Schrock	Yes	35.8	D	M9R5A	2300'	No	-
M9R6	Cambria Fuel Co.	Yes		D	M9R6A	2300'	No	-
↗M9R9	Beulah Coal Co.	No	-	D	M9R9A	2380'	No	-
↗M9R10	Cambria (Luce & Kowaleski)	Yes	850	D	M9R10A	2380'	No	-
#M9R11	Thermal Coal Mining Co.	Yes		D	M9R10B	2380'	No	-
M9R13	Rice Coal Co.	Yes	21.2	E	M9R11A	2520'	No	-
↗M9R14	Thermal Coal Mining Co.	Yes		D	M9R13A	2400'	No	-
M9R26	Chas. Burke	Yes	22.5	D	M9R14A	2400'	No	-
↗M9R27	Unknown	No	-	E*	M9R26A	2430'	No	-
↗M9R28	Unknown	No	-	-	M9R27A	2400'	No	-
#M9R29	Unknown	No	-	-	M9R28A	2400'	Yes	-
↗M9R30	Unknown	No	-	E*	M9R28B	2400'	No	-
				E*	M9R29A	2480'	Yes	-
				E*	M9R29B	2480'	No	-
				D*	M9R30A	2280'	Yes	-

* Indicates assumed.

↗ Possible interconnection with strip mine S9R7.

Possible interconnection with strip mine S9R15.

↗ Possible interconnection with strip mine S9R16.

TABLE 24

Abandoned Deep Mine Average Water Quality Data
Sub-watershed 9R

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
M9R28	6.1	.19	*	.03	.03	.10	*	5,760
		-		.2%	.1%	-		-
M9R29	6.0	.12	*	.05	.24	2.06	*	2,880
		-		.3%	.4%	-		-
M9R30	6.3	-	*	.30	.45	210.35	*	180,000
		-		2%	.8%	4%		1.2%

*Not analyzed.

Strip Mines

The Commonwealth records indicate that there are 13 strip mines in this sub-watershed. Our field investigations have located 5 surface mines with 3 flowing. Table 25 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, and whether it connects with a deep mine.

The total acreage of abandoned surface mines in subwatershed 9R is 230.50 acres (3.50% of the sub-watershed area).

Table 26 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 Station SC9R1, Glades Creek. Where a single surface mine has more than one flow, the averages have been added together.

Following Table 26 is the description of the flowing strip mines along with abatement recommendations.

TABLE 25

Abandoned Surface Mines
Sub-watershed 9R

Mine Number	Name of Mine or Operator	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S9R7	Svonavec Inc.	198.34	-	Yes	M9R5, M9R9, M9R10, M9R30
S9R15	Godin & Schmidt	9.18	E,D	No	M9R11, M9R29
S9R16	Thermal Coal Mining Co.	9.18	D	No	M9R14, M9R27, M9R28
S9R17	Thermal Coal Mining Co.	9.18	D	Yes	No
S9R31	Unknown	4.59	D*	Yes	No

*Indicates assumed.

TABLE 26

Abandoned Surface Mine Average Water Quality Data
Sub-watershed 9R

Mine No.	pH	Net Cold Acid ppd	Net Hot Acid ppd	Ferrous Iron ppd	Total Iron ppd	Sulfate ppd	Hardness ppd	Flow gpd
S9R7	5.2	.92	*	.76	1.36	50.02	*	61,920
				4.9%	2.3%	1%		.4%
S9R17	4.9	19.55	*	1.26	1.95	125.46	*	120,960
				8.2%	3.3%	2.4%		.8%
S9R31	6.7	-	*	.04	.06	38.59	*	20,160
				.3%	.1%	.7%		.1%

* Not analyzed.

Strip Mine: S9R7

Area: 198.34 acres

Location: North of Pa. Turnpike and intersected by L.R. 55123

Status: Abandoned/ part reclaimed

Owned by: Svonavec

Seam mined: Unknown

Connection with deep mines: M9R5, M9R9, M9R10, M9R30

Flowing: Five leaching areas

General Description:

Part of the center portion of this strip has been reclaimed, but due to flows in the north of the strip, leaching and erosions exist along the benches and off the 35' highwalls. Many depressions are evident in the area. The existing vegetation is good.

Recommendation:

Ditches along the highwalls, above and below, 25% of the area regraded and backfilling of the depressions should be done in conjunction with Strip Mine S7R28 and the connecting deep mines.

Cost:

Ditches	10,000'	\$ 10,000
Regrade 25% @ \$1800/acre		90,000
Backfill depressions		5,000
Revegetate 10% of the area		<u>10,000</u>
Total		\$115,000

Strip Mine: S9R17

Area: 9.18 acres
Location: West of Strip Mine S9R7 and East of Rt. T529
Status: Abandoned
Owned by: Thermal Coal Mining Co.
Seam mined: D
Connection with deep mine: None
Flowing: Three leaching areas

General Description:

Leaching and erosion occur below the highwall and around the spoil piles which slope toward and away from the highwall. The existing vegetation is good.

Recommendation:

Ditches above and below the highwall leading to settling ponds. Grading to remove the spoil pile will also be necessary.

Cost:

Ditches	4000'	\$4,000
Grading \$1,800/acre		<u>5,000</u>
Total		\$9,000

Strip Mine: 9R31

Area: 4.59 acres
Location: NE of Rt. T517
Status: Abandoned
Owned by: Unknown
Seam mined: Assumed D seam
Connection with deep mine: None
Flowing: One leaching area

General Description:

Most of the area has medium to thick vegetation of grasses and trees except around the highwall where springs are flowing creating a pond.

Recommendation:

Flow from this strip mine is of a good quality, therefore, no work is recommended.

Recommendations

Table 27 gives the recommended abatement procedures with cost benefication for all polluting deep and surface mines. Table 28 lists the sources abated, the amount of benefication and the costs associated with each recommendation.

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

Although Glades Creek Station SC9R1, is not considered a polluting stream, it is in an area that has experienced fish kills due to mine acid slugging.

TABLE 27

Recommended Abatement Procedures - Cost Benefication

Sub-watershed 9R

Rank	Number	Recommended Abatement		Total Costs		Cost \$/Pound Acid Removal		Total Acid Abate-	Total Iron Abate-	Percent of Total Sub-watershed
		Known Sources	Poten- tial Sources	Known Sources	Poten- tial Sources	Known Sources	Poten- tial Sources	ment ppd	ment ppd	Acid Iron
1	S9R17	9.18 acres of strip mine		\$9,000	\$9,000	\$767.26	\$767.26	11.73	1.17	1.97%

TABLE 28

Benefication - Recommended Plans
Sub-watershed 9R

Plan	Above Sources Abated	Acid		Iron		Total Construction Costs	
		ppd	% of Total Sub-water- shed	ppd	% of Total Sub-water- shed	Flowing Sources	Potential Sources
A	1	11.73	-	1.17	1.97%	\$9,000	\$9,000

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