

TABLE 85
Abandoned Surface Mines
Sub-watershed
9R

Mine Number	Name of Mine or Operator	Permit No.	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S9R101	Unknown	--	16.52	SEW*	Yes	M9R59
S9R103	Menallen Coke Co.	15976	36.72	SEW	Yes	M9R88-M9R71
S9R105	Wm. Piccolomini	462M29	31.21	PGH	Yes	--
S9R106	Bridgeview Coal Co.	10023	141.37	SEW	Yes	M9R60-M9R64 M9R65 M9R87
	Fred C. Warman	16637		SEW & RED		
	Wm. Piccolomini	462M29		PGH		
	Holly Strozza Co.	16180		RED		
S9R108	W.L. & V.R. West	11044	7.34	SEW	Yes	--
S9R110	Genovese Coal Co.	10965	165.24	SEW	Yes	M9R42-M9R89
S9R112	Edward G. Miller	462M39	119.34	RED	No	--
S9R113	Greenspan Coal Co.	16833	68.85	SEW & RED	No	--
S9R114	Wm. L. Piccolomini	13644	83.54	PGH	Yes	--
S9R116	A. Ray Guseman Coal Co.	11093	64.26	PGH	No	M9R36

*Assumed

TABLE 85 (cont'd)
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Mine Number	Name of Mine or Operator	Permit No.	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S9R118	Menallen Coke Co. S.B. & S.C. Co. Bridgeview Coal Co. Wm. Piccolomini Coal Co. Kismet Coal Co.	2969B6M6	178.09	RED RED RED RED RED	Yes	M9R24 M9R78 M9R202
S9R120	Bridgeview Coal Co.	18567	34.88	RED	Yes	--
S9R121	Pontorero & Sons	18511	51.41	RED	No	--
S9R122	Unknown	--	33.05	PGH*	Yes	--
S9R123	Unknown	--	4.59	PGH*	Yes	--
S9R124	Edward G. Miller	1664BSM1	4.59	PGH & RED	No	--
S9R125	Unknown	--	6.43	PGH*	Yes	BH9R2-M9R90
S9R127	Unknown	--	41.31	PGH*	Yes	BH9R1
S9R129	Unknown	--	16.52	PGH*	Yes	M9R209
S9R130	Edward G. Miller	19484	137.70	RED	No	M9R75-M5R3A,B

*Assumed

TABLE 85 (cont'd)
Abandoned Surface Mines
Sub-watershed
9R

Mine Number	Name of Mine or Operator	Permit No.	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S9R131	Unknown	--	4.59	PGH*	No	M9R92
S9R132	Unknown	--	51.41	PGH*	Yes	MP9R10A MP9R11A, B, C
S9R133	Unknown	--	89.05	PGH*	Yes	M9R208A, B
S9R139	Unknown	--	10.10	SEW*	No	M9R81
S9R140	Wm. Panzera Marsolino & Zapotosky Co. Piccolomini Coal Co.	11149 14588 15404	159.73	RED PGH PGH	Yes	M9R28
S9R141	Unknown	--	10.10	PGH*	No	--
S9R149	Unknown	--	33.96	PGH*	Yes	M9R206-BH29A
S9R151	Unknown	--	17.44	PGH*	No	--
S9R155	Dulick Coal Co.	11352	57.83	SEW	Yes	M9R70
S9R156	Leckrone Coal & Coke Co.	10833	3.67	PGH	No	--

*Assumed

TABLE 85 (cont'd)
Abandoned Surface Mines
Sub-watershed
9R

Mine Number	Name of Mine or Operator	Permit No.	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S9R160	John J. Arendas Co.	2966BSM96	55.08	RED	No	--
S9R163	Unknown	--	37.64	SEW*	No	--
S9R165	C.P. & S. C. Co.	17190	13.77	PGH	Yes	--
S9R166	Swaney & Swaney	13779	41.31	PGH	Yes	--
S9R171	Henckel Const. Co.	18216	21.11	PGH	No	--
S9R173	Unknown	--	27.54	PGH*	No	--
S9R174	Edward G. Miller S.B. & S.C. Co.	19002 12454	163.40	RED RED	No	-- --
S9R175	S.B. & S.C. Co.	13227	105.57	RED	Yes	--
S9R176	Edward G. Miller	10899	39.47	PGH	Yes	--
S9R179	Smith & Wise	11347	122.09	RED	No	--
S9R180	Holly Coal Co.	17091	10.10	RED	No	--
S9R181	Edward G. Miller	19484	12.85	RED	Yes	M9R76

*Assumed

TABLE 85 (cont'd)
Abandoned Surface Mines
Sub-watershed
9R

Mine Number	Name of Mine or Operator	Permit No.	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S9R183	Holly Strozza Bartoni Coal Co.	17828 2965BSM6	108.32	PGH PGH	Yes	M9R12
S9R186	John B. Reese	17159	78.03	PGH	Yes	M9R1A,B
S9R187	Unknown	--	32.13	PGH*	Yes	M9R75A
S9R188	Unknown	--	32.13	PGH*	Yes	--
S9R189	Unknown	--	31.21	PGH*	Yes	--
S9R190	Unknown	--	50.49	PGH*	Yes	--
S9R191	Unknown	--	37.64	SEW*	No	M9R95
S9R192	Unknown	--	66.10	SEW*	No	--
S9R193	Unknown	--	8.26	SEW*	No	--
S9R194	Unknown	--	15.61	SEW*	No	--
S9R195	Unknown	--	6.43	SEW*	No	--
S9R196	Unknown	--	12.85	SEW*	No	--

*Assumed

TABLE 86
 ABANDONED SURFACE MINE AVERAGE WATER QUALITY DATA
 Mine-entrances
 9R

Station	pH	Hot Acid		Alkalinity		Net Hot Acid		Ferrous Iron		Iron as Fe		Sulfate		Flow	
		PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	GPCY	G.P.D.
9R101	2.9	1173	291.8	0	0	1173	291.8	1.9	.36	70.21	24.81	1962	444.7	42	60,480
%	-	-	-	-	-	-	1.14%	-	.02%	-	.15%	-	.72%	-	.10%
9R103	3.0	3695	229.3	0	0	3695	229.3	45.59	1.33	401.5	17.74	8036	491.3	41	59,040
%	-	-	-	-	-	-	.90%	-	.06%	-	.11%	-	.79%	-	.10%
9R105	2.8	696.7	57.53	0	0	696.7	57.53	.75	.01	56.96	4.22	750	49.28	5	7,200
%	-	-	-	-	-	-	.22%	-	0%	-	.03%	-	.08%	-	.01%
9R106	3.2	13387	1271	332	30.07	13055	1241	54.13	1.67	1438	159.4	22707	1881	162	233,280
%	-	-	-	-	-	-	4.85%	-	.07%	-	.99%	-	3.03%	-	.40%
9R108	3.0	681.6	279.5	0	0	681.6	279.5	7.99	2.07	46.06	12.25	1438	641.2	64	92,160
%	-	-	-	-	-	-	1.09%	-	.09%	-	.08%	-	1.03%	-	.16%
9R110	3.8	1606	242.7	95.6	85.5	1510	157.5	17.99	5.23	96.71	28.47	4849	1072	144	207,360
%	-	-	-	-	-	-	.62%	-	.23%	-	.18%	-	1.73%	-	.36%
9R114	3.7	660	150.7	0	0	660	150.7	0	0	8.9	2.03	950	216.9	19	27,360
%	-	-	-	-	-	-	.59%	-	0%	-	.01%	-	.35%	-	.05%
9R118	3.1	3824	288.8	0	0	3824	288.8	5.6	.58	305.4	21.91	6544	466	32	46,080
%	-	-	-	-	-	-	1.13%	-	.02%	-	.14%	-	.75%	-	.08%
9R120	2.8	3522	73.94	0	-	3522	73.94	40.69	.49	254.3	4.63	5355	110.9	9	12,960
%	-	-	-	-	-	-	.29%	-	.02%	-	.03%	-	.18%	-	.02%
9R122	4.1	657.3	59.60	22	63.79	635.3	58.81	3.36	.23	45.3	4.3	811.7	81.35	11	15,840
%	-	-	-	-	-	-	.23%	-	.01%	-	.03%	-	.13%	-	.03%

TABLE 86 (contd.)
 ABANDONED SURFACE MINE AVERAGE WATER QUALITY DATA
 Sub-watershed
 9R

Station	pH	Hot Acid		Alkalinity		Net Hot Acid		Ferrous Iron		Iron as Fe		Sulfate		Flow	
		PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	GFV	G...D.
S9R123	2.7	1167	72.44	0	0	1167	72.44	48.53	2.58	271.9	16.29	1175	72.12	6	8,640
%	-	-	-	-	-	-	.28%	-	.12%	-	.10%	-	.12%	-	.01%
S9R125	2.9	2385	122.6	0	0	2385	122.6	34.7	1.12	274.4	14.03	3510	173.3	10	14,400
%	-	-	-	-	-	-	.48%	-	.05%	-	.09%	-	.28%	-	.02%
S9R127	2.8	796.9	132.5	0	0	796.9	132.5	5.54	.46	67.95	10.51	1104	179.1	15	21,600
%	-	-	-	-	-	-	.52%	-	.02%	-	.06%	-	.29%	-	.04%
S9R129	2.9	12311	3208	0	0	12311	3208	0	0	6125	10.46	1383	535.6	62	89,280
%	-	-	-	-	-	-	12.54%	-	0%	-	.06%	-	.86%	-	.15%
S9R132	2.7	3516	10399	0	0	3516	10399	6.43	.13	324.9	155.7	4313	1137	42	60,480
%	-	-	-	-	-	-	40.66%	-	.005%	-	.97%	-	1.83%	-	.10%
S9R133	3.8	10298	448.9	224	5.93	10074	433	1.52	.02	256.4	17.48	21150	855.2	35	50,400
%	-	-	-	-	-	-	1.73%	-	0%	-	.11%	-	1.38%	-	.09%
S9R140	3.2	4851	1371	1.5	.02	4849	1371	55.59	9.82	580.1	111.8	5569	1134	76	109,440
%	-	-	-	-	-	-	5.36%	-	.44%	-	.69%	-	1.83%	-	.19%
S9R149	2.9	400	389.5	0	0	400	389.5	0	0	51.2	49.85	550	535.5	81	116,640
%	-	-	-	-	-	-	1.52%	-	0%	-	.31%	-	.86%	-	.20%
S9R155	2.9	3783	276	0	0	3783	276	24.82	1.5	333.2	18.05	4665	615.5	55	79,200
%	-	-	-	-	-	-	1.08%	-	.07%	-	.11%	-	.99%	-	.14%
S9R165	2.5	1228	61.12	0	0	1228	61.12	4.11	.19	203.9	9.83	1117	52.29	4	5,750
%	-	-	-	-	-	-	.24%	-	.01%	-	.06%	-	.08%	-	.01%

TABLE 86 (contd.)
 ABANDONED SURFACE MINE AVERAGE WATER QUALITY DATA
 Sub-watershed
 9R

Station	pH	Hot Acid		Alkalinity		Net Hot Acid		Ferrous Iron		Iron as Fe		Sulfate		Flow	
		PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	GPV	G.P.D.
S9R166	4.4	1517	37.62	126	7.5	1391	30.12	1.12	.04	61.94	1.74	1567	39.44	17	24,480
%	-	-	-	-	-	-	.12%	-	.001%	-	.01%	-	.06%	-	.04%
S9R175	3.2	6236	1591	0	0	6236	1591	17.14	1.89	110	84.62	3391	2609	293	421,920
%	-	-	-	-	-	-	6.22%	-	.08%	-	.52%	-	4.20%	-	.73%
*S9R176															
S9R181	2.6	1260	60.58	0	0	1260	60.58	0	0	166.4	8	1300	62.50	4	5,760
%	-	-	-	-	-	-	.24%	-	0%	-	.05%	-	.10%	-	.01%
S9R183	2.7	2707	834.8	0	0	2707	834.8	1.67	.08	346.8	86.53	3137	792.4	59	84,960
%	-	-	-	-	-	-	3.26%	-	.003%	-	.54%	-	1.28%	-	.15%
S9R186	5.9	80.57	2.72	37.14	.93	43.43	1.79	2.49	.03	9.18	.12	218.3	6.07	3	4,320
%	-	-	-	-	-	-	.006%	-	.001%	-	.001%	-	.009%	-	.007%
S9R187	2.6	2431	395.1	0	0	2431	395.1	2.26	.09	170	35.18	2704	536.6	45	64,800
%	-	-	-	-	-	-	1.54%	-	.004%	-	.22%	-	.86%	-	.11%
S9R188	4.5	1348	16.2	120	1.44	1228	14.76	20.16	.24	53.04	.64	2725	32.76	3	4,320
%	-	-	-	-	-	-	.06%	-	.01%	-	.003%	-	.05%	-	.007%
S9R189	2.9	1515	27.76	0	0	1515	27.76	52.39	.67	338.3	4.35	1570	46.87	11	15,840
%	-	-	-	-	-	-	.11%	-	.03%	-	.03%	-	.08%	-	.03%
S9R190	3.6	646.7	21.71	0	0	646.7	21.71	0	0	32.69	1.14	1167	39.77	6	8,640
%	-	-	-	-	-	-	.08%	-	0%	-	.007%	-	.06%	-	.01%

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*No Flow

Strip Mine S9R101

General Description:

This strip mine is located about 2,500 feet northwest of the intersection between T 524 and 445. It is immediately adjacent to the northern side of T 445. It is completely abandoned although it is 50% vegetated with both grasses and trees. It contains 16.52 acres and is assumed to have mined the Sewickley coal seam. It is directly connected with deep mine M9R59. No highwall was found although numerous gob piles exist. There are two leaches on the strip and both seem to be caused by excessive surface water entering the area. The strip is shown on the map of Sub-watershed 9R, Sheet 1.

Recommendations:

Some grading and revegetating of gob piles is required to prevent ponding. A ditch system is also required for two purposes. One is to reduce the flow of water onto the strip and the other reason is to remove the water quickly if it does get on the strip. The strip mine reclamation should be timed as to not interfere with any deep mine sealing.

Costs:

Grading	5 acres @ \$1,800/acre	\$ 9,000
Vegetation	5 acres @ \$600/acre	3,000
Ditches	1,500 feet @ \$1/foot	<u>1,500</u>
		\$13,500

Strip Mine S9R103 (permit number 15976)

General Description:

This strip is located 1,000 feet northwest of Collier immediately adjacent to the northern edge of T 445. It contains 36.72 acres and mined the Sewickley coal seam. The strip is about 30% reclaimed through grading and revegetation. The vegetation covers 30% of the strip and consists of grasses and trees. A connection with deep mires M9R71 and M9R88 has been established. A 20 to 35 foot highwall is present along with many gob piles. Seven leaches were found on various parts of the strip and most originate from ponds or depressions at the base of the highwall. The mine is shown on the map of Sub-watershed 9R, Sheet 1.

Recommendations:

The gob piles will need to be flattened and revegetated to eliminate areas of percolation. The depressions along the base of the highwall should be filled for the same reason. A ditch system will be required to control surface runoff and to remove it as quickly as possible.

Costs:

Grading	15 acres @ \$1,800/acre	\$27,000
Vegetation	15 acres @ \$600/acre	9,000
Ditches	3,500 feet @ \$1/foot	<u>3,500</u>
		\$39,500

Strip Mine S9R105 (permit number 462M29)

General Description:

This strip is located about 500 feet west of the T 472 and L.R. 26010 intersection which is north of Shoaf. It encompasses 31.21 acres and mined the Pittsburgh coal seam. The strip is about 85% reclaimed through grading and revegetation. The vegetation covers the entire strip scantily with grasses and trees. Two deep mine complexes, M9R51 and M9R212, were found in the area. A 5-10 foot highwall still exists along with a few spoil piles. Only one leach was found, located on the northern side, and it originates from the gob piles. The strip mine is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

The gob piles will definitely require grading and revegetating to expedite runoff and to prevent erosion. A ditch system, to divert and collect surface water, will be needed to abate the pollution from this source.

Costs:

Grading	10 acres @ \$1,800/acre	\$18,000
Vegetation	10 acres @ \$600/acre	6,000
Ditches	5,000 feet @ \$1/foot	<u>5,000</u>
		\$29,000

Strip Mine S9R106 (permit number 10023, 16637, 462M29, and 16180 and priority number 384)

General Description:

This strip mine is traversed by T 445 approximately 4,500 feet northwest of Collier. It is an extremely large mine (141.37 acres) and exploited multiple coal seams (Sewickley, Redstone, and Pittsburgh). There was much deep mining done in the area and openings to the following complexes were found on the strip: M9R60, M9R64, M9R65, and M9R87. It is 25% reclaimed through grading and revegetation. Sixty percent of the mine is covered by grasses and trees. Numerous highwalls or portions of highwalls exist along with spoil piles and ponds. Twenty-seven leaches were found, most of which originate from the bank of a small tributary which crosses the strip. The strip is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

Much of the flow is originating from deep mine openings with the remainder coming from the leaches. Therefore, the deep mine sealing should be completed before the following strip mine reclamation is commenced.

Reclamation consisting of extensive grading, revegetation, and ditching will be required to eliminate the leaches. Most of the leaches are caused by filtration of surface water through spoil piles and from depressions located between the highwall and the spoil pile. These spoil piles should be flattened and revegetated. The depressions should be filled to prevent the collection of water. Finally, some ditches will prevent surface water from entering the area while others will remove drainage from the strip itself. It is very important to time the reclamation of the strip with the sealing of the deep mine openings to achieve maximum abatement.

Strip Mine S9R106 (contd.)

Costs:

Grading	72 acres @ \$1,800/acre	\$129,600
Vegetation	72 acres @ \$600/acre	43,200
Ditches	8,200 feet @ \$1/foot	<u>8,200</u>
		\$181,000

Strip Mine S9RI08 (permit number 11044)

General Description:

This strip mine is located about 2,000 feet northwest of Collier and immediately south of T 445. It contains 7.34 acres and mined the Sewickley coal seam. It is completely reclaimed and vegetated. There are no highwalls, gob piles, ponds, or any deep mine openings. Two leaches were found on the eastern side flowing toward York Run and T 445. The strip is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

The two flows seem to be coming from point sources rather than from an area as with most leaches. Also, there are no depressions to collect water and allow percolation through the strip. The conclusion is that the two so-called leaches are actually deep mine openings that have been stripped away. Therefore, no recommendation can be made without further investigation.

Strip Mine S9R110 (permit number 10965)

General Description:

This strip mine is located approximately 300 feet east of Collier. T 445 traverses the strip while the intersection between T 449 and T 445 is located on the eastern side of the strip. It contains 165.24 acres and mined the Sewickley coal seam. It is about 10% reclaimed through revegetation only. The combined natural and planted vegetation covers 90% of the strip with grasses and trees. A 10-15 foot highwall still exists with gob piles, coke ovens, tipples, settling ponds, and many depressions also being in evidence. There are many deep mine complexes on or very near the area and they are: M9R42, M9R89, M9R93, and M9R94. Erosion can also be found in spots. Eight leaches were found and each seems to be coming from either a spoil pile or a pond. Some kind of coal operation (possibly removing coal from a large slag pile, G9R306,) is being done near the center of the strip. The strip is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

It is not known what effect the active operation has upon the pollution discharge from the strip. However, it is felt that it is significant. Therefore, no recommendations are made until further study is completed.

Strip Mine S9R114 (permit number 13644)

General Description:

This strip mine is located immediate south of the intersection between T 419 and L.R. 26010 and about 1,000 feet west of York Hun. It encompasses 83.54 acres and mined the Pittsburgh coal seam. It is about 80% reclaimed through grading and revegetation. Grasses and trees cover 90% of the strip. One leach was found on the south side. No highwalls were evidenced although spoil piles and low areas are present. No deep mine openings were found on the strip mine. The strip is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

The leach actually comes from a partially broken and buried pipe. This suggests deep mining activity and, therefore, no recommendations are made until further investigation is made.

Strip Mine S9R118 (permit number 2969B6M6)

General Description:

This mine is located about 1,000 feet southwest of Shoaf and about 1,500 feet west of Smiley. It contains 178.09 acres and mined the Redstone coal seam. A small portion is still being mined while the remainder is 70% reclaimed through grading and revegetation. Grasses and trees cover about 50% of the area. The Shoaf Motor Cross Track is situated on the northern side of the strip mine. There are a few highwalls, ranging from 20 to 40 feet in height, and numerous spoil piles and depressions. Five leaches were discovered on the western side and drain to a York Run tributary. Deep mine connections with M9R25, M9R28 and M9R202 have been established. Three large gob piles, G9R304, G9R305, and G9R318, are present here also. The strip is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

Each of the leaches originate from either a spoil pile or a depression. Grading of spoil piles, filling in depressions, revegetation, and ditching will be required on about 30% of the strip mine. The purpose of this particular reclamation is two fold. First, surface water is diverted from entering the area by diversion ditches, and thereby the possible water that is available for the pollution reaction is reduced. Secondly, water that does come into the area is removed as quickly as possible. This is accomplished by giving the strip a good slope, increasing plant life and therefore transpiration, and by runoff ditches which collect and remove surface runoff. By reducing the quantity of water available and the time it is available, the pollution quantities should be drastically reduced.

Strip Mine S9R118 (contd.)

Costs:

Grading	54 acres @ \$1,800/acre	\$ 97,200
Vegetation	54 acres @ \$600/acre	32,400
Ditches	5,500 feet @ \$1/foot	<u>5,500</u>
		\$135,100

Strip Mine S9R120 (Permit number 18567)

General Description:

This strip mine is located approximate 3,000 feet west of the L. R. 2600 7 and T 40 3 intersection. It is comprised of 34.88 acres and mined the Redstone coal seam. The strip is about 30% reclaimed through grading and re-vegetation. Fifty percent of the strip is vegetated with grasses and trees. A long 25 foot highwall extends along the northern and western sides of the strip. The northern portion of the mine has many spoil piles and is badly scarred. Four leaches were found on the northeastern side and their origin is the spoil piles to the north. Deep mine complexes M9R23 and M9R79 are 200-300 feet off the eastern edge of the strip mine, which is shown on the map of Sub-watershed 9R, sheet 2.

Recommendation:

Much grading of spoil piles is required since they are the cause of most of the leaching. This newly graded spoil will require an immediate vegetative cover to prevent erosion. A ditch system above and below the existing highwall should impede the flow of surface water into the area. One isolated leach on the southern edge is caused strictly by surface runoff and can be controlled by a diversion ditch.

Costs :

Grading	25 acres @ \$1,800/acre	\$45,000
Vegetation	25 acres @ \$600/acre	15,000
Ditches	4,000 feet @ \$1/foot	<u>4,000</u>
		\$64,000

Strip Mine S9R122

General Description:

This strip mine is located 2,000 feet east of the intersection between T 462 and L.R. 26193. It a long, narrow strip consisting of 33.05 acres. No records of the operation have been found, but it is assumed that the Pittsburgh coal seam was mined. It is 90% reclaimed through grading and re-vegetation. The vegetation, consisting of medium to thick grasses and trees, covers the entire mine. A small 8 foot highwall and the inevitable spoil pile still remains on one portion. The two leaches found originate in this area. No deep mine complexes could be found here. The strip is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

A combination of grading, revegetating, and ditching is the reclamation needed here to eliminate the leaching. The grading and revegetating activity will involve approximately 10% of the strip and will be concentrated on two large spoil piles. The ditching will be located near the present highwall and will remove surface runoff from the area.

Costs:

Grading	4 acres @ \$1,800/acre	\$ 7,200
Vegetation	4 acres @ \$600/acre	2,400
Ditches	2,000 feet @ \$1/foot	<u>2,000</u>
		\$11,600

Strip Mine S9R123

General Description:

This strip mine is located approximate 300 feet north-west of the intersection between L.R. 26008 and T 462. It is enclosed with the highway triangle formed by L.R. 26009, L.R. 26193, and T 462 and is situated on the Fayette Anticline. It consists of 4.59 acres and is assumed to have mined the Pittsburgh coal seam. The mine is completely reclaimed and revegetated. The vegetation is mediumly thick and is comprised of trees and grasses. No highwall or spoil piles remain. Many sink holes are present on the strip area which collect water. One leach was found on the southwestern side. No evidence of any deep mining could be found in the area. The strip is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

The sink holes will have to be filled and graded to a slope conducive to surface runoff. Then, the area will require revegetation. A ditch system to control and convey runoff will be placed on the upslope side. The ditches will be clay-lined due to the permeable nature of the soil.

Costs:

Grading (filling in sink holes)		
	2 acres @ \$900/acre	\$ 1,800
Vegetation	2 acres @ \$600/acre	1,200
Ditches	1,400 feet @ \$7/foot	<u>9,800</u>
		\$12,800

Strip Mine S9R125

General Description:

The strip mine is located within the T 403, L.R. 26008 and L.R. 26007 highway triangle. In fact, it is located about 3,000 feet southwest of the intersection between T 403 and L.R. 26007. It consists of 6.43 acres and is assumed to have mined the Pittsburgh coal seam. It is 40% reclaimed through gradation and revegetation. Seventy percent of the area is covered with grasses and trees. A 30 foot highwall along with the accompanying spoil piles and depressions exist at the strip. Three leaches were found, all on the eastern portion. A deep mine connection with the M9R2 and M9R90 complexes has been established. The strip mine is spotted on the map of Sub-watershed 9R, sheet 2.

Recommendation:

One of the leaches actually originates from a crumbled and broken pipe. This, coupled with the presence of deep mine openings, has given substance to the theory that the leaches might actually be caused by flow from the deep mine complexes. Therefore, no recommendations are given at this time.

Strip Mine S9R127

General Description:

This strip mine is located within the highway triangle formed by L.R.26008, L.R. 26007, and T 472. It is 2,000 feet north of the L.R. 26008 and L.R. 26007 intersection. It encompasses 41.31 acres and is assumed to have exploited the Pittsburgh coal seam. It is completely reclaimed and revegetated. The vegetation is both grasses and trees. No high-wall or spoil piles are remaining on the strip mine. No evidence of deep mining has been found except for a bore hole (BH9R1). One leach was found on the eastern side. Erosion ditches are present and indicate excessive surface runoff. The mine is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

As mentioned above, uncontrolled surface runoff is the real problem here. Since the strip is completely vegetated and has an adequate slope, a ditch system is primarily all that is recommended. It should be located to prevent drainage from upslope areas from traversing the strip. It should also remove the strip drainage quickly from the area.

Costs:

Ditches	1,500 feet @ \$1/foot	\$1,500
Grubbing (minimal)		<u>500</u>
		\$2,000

Strip Mine S9R129

General Description:

This strip mine is located approximately 3,000 feet northeast of the intersection between u.s. Route 119 and L.R. 26008 on the western side of the former. It encompasses 16.52 acres and is assumed to have mined the Pittsburgh coal seam. It is about 80% reclaimed through grading and revegetation. The vegetative cover is composed of grasses and trees, primarily natural vegetation. A 20 foot highwall extends along a portion of the southern section. Gob and spoil piles form 2 leaches, also on the southern side. Erosion ditches signify uncontrolled surface runoff. Deep mine M9R209 has been located in the strip mine area. The strip is spotted on the map of Sub-watershed 9R, sheet 2.

Recommendations:

The gob and spoil piles should be graded to slope conducive to runoff and then revegetated. A pond is formed between two gob piles and must be filled in. A ditch system at each of the two leaches will divert and collect surface runoff. The drainage will be to a tributary of York Run. The deep mine sealing, if any, should be coordinated with the reclamation program.

Costs:

Grading	5 acres @ \$1,800/acre	\$ 9,000
Vegetation	5 acres @ \$600/acre	3,000
Ditches	3,500 feet @ \$1/foot	<u>3,500</u>
		\$15,500

Strip Mine S9R132 (priority number 396)

General Description:

This strip mine is the only one within the area enclosed by L.R. 26008, T 502, T 387, and T 472. It is located about 800 feet southwest of the intersection between L.R. 26008 and T 502. One section of the mine was recently mined, but is now reclaimed adequately through grading and some revegetation. The entire strip is now about 35% reclaimed. It is sparsely vegetated in most areas and is badly scarred. A 20 foot highwall exists on the abandoned portion. The entire strip is made up of 51.41 acres and is assumed to have mined the Pittsburgh coal seam. Much deep mining has been done here as is evidenced by complexes M9RIO and M9R11. Four leaches were found, one very near the recently reclaimed northern region and three on the southern edge. Erosion is prevalent on the entire strip but is worse near the spoil piles (i.e. maximum ground slopes). Water lies between the spoil piles and the highwall. The strip mine is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

The abundance of deep mine openings on the strip suggests that the entire area has been undermined. There is the possibility that the northern-most leach is caused by the deep mining activity. However, it is felt that a greater possibility exists of the leach being from the strip itself due to ponds and depressions in the area. Therefore, it is recommended that minor grading, filling, revegetating, and ditching be performed here. However, the flowing deep mine openings in the area should first be sealed, and the leach monitored to substantiate this. As far as the three southern leaches are concerned, they are most probably caused by surface runoff and can be eliminated by minimal revegetating and ditching.

Strip Mine S9R132 (contd.)

Costs:

Grading	5 acres @ \$1,800/acre	\$ 9,000
Vegetating	10 acres @ \$600/acre	6,000
Ditching	3,500 feet @ \$1/foot	<u>3,500</u>
		\$18,500

Strip Mine S9R133

General Description:

This strip mine is located 300 feet south of Bowood and lies south of T 387. It is only 200 feet southwest of the intersection between T 387 and T 464. It is a fairly large and irregular strip (89.05 acres) and is assumed to have mined the Pittsburgh coal seam. It is about 90% reclaimed with only a few scattered spoil piles and depressions. The depressions are caused by subsidence from deep mining (M9R208). There is evidence of deep mine fires in the area. The strip mine is thickly vegetated with grasses and trees. Nine leaches were found in various locations on the strip perimeter. Erosion has been taking place in some areas. The strip mine is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

In most cases the leaches are caused by spoil piles or water-collecting depressions. A combination of grading, filling, revegetating and ditching will be necessary. The earthwork and subsequent planting will involve about 25% of the strip. The ditch system will be extensive and, in general, will be concentrated on areas upslope from the leaches.

Costs:

Grading	22 acres @ \$1,800/acre	\$39,600
Vegetation	22 acres @ \$600/acre	13,200
Ditches	8,000 feet @ \$1/foot	<u>8,000</u>
		\$60,800

Strip Mine S9R140 (permit numbers 11149, 14588, 15404 and priority number 428)

General Description:

This strip mine is located 300 feet north of Shoaf. It is a large (159.73), irregular strip with an approximate length of 6,000 feet. It has mined the Pittsburgh and Redstone coal seams under three different operators. It is 70% reclaimed through grading and revegetation. The vegetation, grasses and trees, covers 90% of the strip. It is thought to be primarily undermined by the M9R28 complex. It is badly scarred in a few areas with gob piles, spoil piles, ponds, depressions and highwalls. One highwall is about 30 feet high, although most have been backfilled with spoil until only the top few feet exist. Six leaches have been located, primarily originating from spoil piles and ponds. Erosion is present in some sections of the area. The strip mine is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

About 20 acres of the strip will require complete reclamation to abate most of the leaching. This reclamation will consist of grading, grubbing, revegetating, backfilling, and ditching. This should be coordinated with sealing of the deep mine openings.

Costs :		
Grading	20 acres @ \$1,800/acre	\$35,000
Vegetating	20 acres @ \$600/acre	12,000
Grubbing (minimal)		1,000
Ditching	15,000 feet @ \$1/foot	<u>15,000</u>
		\$64,000

Strip Mine S9R149

General Description:

This strip mine is located 2,500 feet northwest of Shoaf and 700 feet east of the T 419 and L.R. 26193 intersection. It encompasses 33.96 acres and is assumed to have mined the Pittsburgh coal seam. It is 100% reclaimed through grading and revegetation. The vegetation, which covers the entire strip, consists of mediumly thick grasses and trees. Deep mine connections with M9R206 and BH29 have been determined. A leach has been found on the northern section of the strip and is originating from a pipe. The strip mine is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

The pipe which is supplying the flow quite possibly could be a mine pipe which is draining an opening. Therefore, until further study is done, no recommendations can be made at this time.

Strip Mine S9R155 (permit number 11352)

General Description:

This strip mine is located 3,500 feet east of Shoaf and is immediately east of the intersection between L.R. 26007 and L.R. 26010. It contains 57.83 acres and mined the Sewickley coal seam. It is completely reclaimed through grading and re-vegetation. The strip is 95% vegetated with grasses and trees. Some of the mine is also planted in corn. Openings to the M9R70 deep mine complex have been found on the strip mine. No highwall, spoil piles, or any of the other remnants of the stripping remain. Seven leaches were found, all on the southern side. They are caused by surface runoff. This runoff also has eroded many areas of the strip, which is shown on the map of Sub-watershed 9R, sheet 1.

Recommendations:

The surface runoff, and therefore the leaches, can be controlled by a ditch system upslope from the leaches. The ditch system should be located to minimize the damage or potential damage to the crop land while still obtaining the required pollution abatement.

Costs:

Ditches	4,000 feet @ \$1/foot	\$4,000
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Strip Mine S9R165 (permit number 17190)

General Description:

This strip mine is located 1,000 feet south of the T 417 and L.R. 26193 intersection and 200 feet north of the L.R. 26193 and T 462 intersection. It contains 13.77 acres and mined the Pittsburgh coal seam. It is no affiliated with any deep mining activity. The strip is 100% reclaimed and revegetated. One leach has been found on the eastern side which is caused by surface water traversing the strip too slowly. The strip is shown on the map of Sub-watershed 9R, sheets 1 and 2.

Recommendations:

This strip mine, or at least a portion of it is presently under permit to Barton Coal Company, mining permit number 503-17 and water permit number 3372-SM16. Therefore, no recommendations are given.

Strip Mine S9R166 (permit number 13779)

General Description:

This strip mine is located east of Woodside, approximately 500 feet east of the L.R. 26008 and T 462 intersection. It is on the eastern slope of the Fayette Anticline. It contains 41.31 acres and exploited the Pittsburgh coal seam. It is completely reclaimed and has been revegetated with grasses and trees. No deep mines are in the area. Five leaches have been found on the strip and can be attributed to the flow of surface water through the area. Erosion is evident in some areas. The strip mine is located on the map of Sub-watershed 9R, sheet 2.

Recommendations:

A ditch system to control the surface runoff is all that is required here. In all cases it should be located upslope of the leaches.

Costs :

Ditches	3,500 feet @ \$1/foot	\$3,500
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Strip Mine S9R175 (permit number 13227 and priority number 417)

General Description:

This strip mine is located 4,000 feet southwest of York Run and on the eastern slope of the Uniontown Syncline. It is north of U.S. Route 119 and south of T 403. It encompasses 105.57 acres and mined the Redstone coal seam. The strip has recently been reclaimed and has been revegetated with grasses. No highwall or spoil piles were overlooked. No deep mining was done in the area. Six leaches were found on various parts of the strip which seem to be caused by the heavy surface runoff. The top layer of the graded spoil is spongy in nature and absorbs much water. It has not been compacted well. Erosion is present over most of the strip, which is spotted on the map of Sub-watershed 9R, sheet 2.

Recommendations:

Controlling the surface water infiltration is the crux of the pollution problem here. The strip should first be compacted to reduce the permeability of the top layer. Also, at least 30% of the strip should be revegetated to support the existing plant life. A system of diversion ditches will be necessary to aid in the control of erosion by surface flow. Finally, along with the compaction, some minimal grading and filling of a few low areas will be required.

Costs:

Grading	10 acres @ \$1,800/acre	\$18,000
Compaction		10,000
Filling		5,000
Vegetation	30 acres @ \$600/acre	18,000
Ditches	5,500 feet @ \$7/foot	<u>38,500</u>
		\$89,500

Strip Mine S9R181 (permit number 19484)

General Description:

This strip mine is located 2,500 feet northeast of Bowood and 1,800 feet northeast of the T 387 and 464 intersection. It encloses 12.85 acres and mined the Redstone coal seam. An opening to the M9R76 complex has been found on the strip. S9R181 is only about 10% reclaimed through minimal grading. Seventy percent is vegetated naturally with grasses and trees. A 10 to 15 foot highwall extends the length of the strip mine. The spoil was pushed downslope leaving a water-collecting depression between it and the highwall. A leach was found which can be attributed to the depression mentioned above. The strip mine is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

The spoil should be backfilled against the highwall to eliminate the depression. This will only be necessary on half of the strip. The graded spoil should then be revegetated and protected by a diversion ditch system. The strip area near the deep mine opening should be ignored until its sealing program is completed.

Costs:

Grading	7 acres @ \$1,800/acre	\$12,600
Vegetation	7 acres @ \$600/acre	4,200
Ditches	2,000 feet @ \$1/foot	<u>2,000</u>
		\$18,800

Strip Mine S9R183 (permit numbers 17828 and 2965BSM6)

General Description:

This strip mine is located about 2,000 feet southeast of Bowood and approximately 600 feet southeast of the T 387 and T 464 intersection. It contains 108.3 acres and mined the Pittsburgh coal seam. Deep mine M9R12 openings were found on the strip. It is 100% reclaimed and revegetated. Grasses comprise most of the vegetative cover. No highwall, gob or spoil piles remain. Two leaches were found, both on the eastern side. They seem to be caused by the slow movement of surface water on the strip. The strip is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

The surface flow must be removed off the strip as quickly as possible to reduce the possibility of percolation and therefore, the leaching. The ditch system should be concentrated on the eastern flank, upslope from the leaches.

Costs:

Ditches	2,000 feet @\$1/foot	\$2,000
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Strip Mine S9R186 (permit number 17159)

General Description:

This strip mine is located 1,000 feet south of the T 429 and L.R. 26077 intersection in Old Frame. It encompasses 78.03 acres and mined the Pittsburgh coal seam. It is almost completely reclaimed with a few spoil piles and a depression. Openings to the M9R1 complex were located on the northern side of the strip. The strip is well vegetated with grasses and trees. One leach originates from the spoil and the depression area. The strip mine is shown on the map of Sub-watershed 9R, sheet 3.

Recommendations:

Grading the spoil into the depression and then revegetating it will be required here. A ditch above the spoil will divert water from the newly graded area and a ditch through the spoil will collect surface drainage.

Costs:

Grading	7 acres @ \$1,800/acre	\$12,600
Vegetation	7 acres @ \$600/acre	4,200
Ditches	3,000 feet @ \$1/foot	<u>3,000</u>
		\$19,800

Strip Mine S9R187

General Description:

This strip mine is located 3,500 feet southwest of Smithfield and immediately west of the intersection between U.S. Route 119 and T 373. It is a long, narrow strip consisting of 32.13 acres and is assumed to have mined the Pittsburgh coal seam. It is 90% reclaimed through grading and revegetation. Grasses and trees cover the entire area. The eastern portion of the strip has spoil piles remaining which are responsible for the three leaches that were found. A very small amount of surface drainage crosses the strip mine. Deep mine M9R75 underlays the area. The strip mine is shown on the map of Sub-watershed 9R, sheet 3.

Recommendations:

The spoil piles require grading and revegetating since they are the source of the pollution. A small ditch system will complete the reclamation required at this strip mine.

Costs :

Grading	10 acres @ \$1,800/acre	\$18,000
Vegetation	10 acres @ \$600/acre	6,000
Ditches	2,700 feet @ \$1/foot	<u>2,700</u>
		\$26,700

Strip Mine S9R188

General Description:

This strip mine is located 3,000 feet west of Bowood and approximately 500 feet north of the T 387 and L.R. 26077 intersection. Approximately 32.13 acres of this large strip mine are within the Georges Creek Watershed. This portion is 90% reclaimed through revegetation and grading. The vegetation covers 90% of the strip and consists of both grasses and trees. No deep mining has been performed here. Three leaches were found on the southern portion and seem to be caused by surface runoff. Erosion is also a problem here. The strip is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

Surface water diversion ditches, placed upon the strip, will collect and remove quickly the drainage that is, at present, uncontrolled. This should also eliminate the source of water for the leaches. Minimal revegetation and grading in the areas of these leaches will also be required.

Costs:

Grading	3 acres @ \$1,800/acre	\$5,400
Vegetation	3 acres @ \$600/acre	1,800
Ditches	2,000 feet @ \$1/foot	<u>2,000</u>
		\$9,200

Strip Mine S9R189

General Description:

This strip mine is located about 2,000 feet north of Bowood and 3,500 feet south of Woodside. It is approximately 1,500 feet north of the T 387 and T 464 intersection. It encompasses 31.21 acres and is assumed to have mined the Pittsburgh coal seam. It is about 85% reclaimed through grading and revegetation. Eighty-five percent, of the strip is covered by grasses and trees. No deep mine openings were found in the area. A 5 to 10 foot highwall and the accompanying spoil piles still exist on a finger projection of the strip. One leach was found on a northern portion and is supplied by surface flow originating upslope off the strip. No erosion was evidenced in the area. The mine is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations :

The leach is located on a section that has been reclaimed. The existing highwall and spoil piles do not seem to be affecting the leach flow at all. Therefore, a ditch system upslope of the leach to prevent the inflow of drainage onto the strip mine should eliminate the leach.

Costs:

Ditches	2,700 feet @ \$1/foot	\$2,700
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Strip Mine S9R190

General Description:

This strip mine is located 2,000 feet southeast Woodside and 500 feet south and southwest the T 462 and L.R. 26008 intersection. It contains 50.49 acres and is assumed to have mined the Pittsburgh coal seam. It is 85% reclaimed through grading and revegetation. The vegetative cover, which blankets the entire strip mine, is primarily grasses and trees. A 15 to 20 foot highwall, spoil piles, and a large depression exist near the center of this long narrow strip. These contribute to the two leaches that were found downslope. Deep mine M9R20 has an opening on the perimeter of the strip, but its shaft is directed off the strip mine and into the hillside. No erosion is evident in the area. The strip mine is shown on the map of Sub-watershed 9R, sheet 2.

Recommendations:

Since the depression between the spoil and the highwall is the major cause of the pollution, some spoil should be graded back against the highwall to eliminate the collection of water. Once protected by a vegetative cover and a ditch system, the spoil should not produce any pollution.

Costs:

Grading	10 acres @ \$1,800/acre	\$18,000
Vegetation	10 acres @ \$600/acre	6,000
Ditches	3,000 feet @ \$1/foot	<u>3,000</u>
		\$27,000

Recommendations

Table 87 gives the recommendations for the polluting deep and strip mines, along with the costs associated with each recommendation. The order in which they are placed is determined by the cost per pound of acid removal.

An estimated effectiveness of 75% reduction of pollution load is assigned for each recommendation.

Table 88 lists the sources abated, the amount of beneficiation, and the costs associated with each plan.

The distance from Sampling Station GC9R1 to the next polluting tributary downstream, GC8L3, is one mile. This is the minimum distance on Georges Creek that would benefit from the recommended work.

TABLE 87
 RECOMMENDED ABATEMENT PROCEDURES - COST BENEFICATION
 SUB - WATERSHED
 9R

Rank	Mine No.	TOTAL COSTS		COST \$/POUND ACID REMOVAL		Total Acid Abated	Total Iron Abated	% OF TOTAL SUB-WATERSHED	
		Known Sources	Potential Sources	Known Sources	Potential Sources	PPD	PPD	Acid	Iron
1	S9R132	\$ 18,500	\$ 293,500	\$ 2.37	\$ 37.63	7799	116.78	30.5%	.73%
2	S9R183	2,000	2,000	3.19	3.19	626.1	64.90	2.45%	.4%
3	S9R129	15,500	40,500	6.44	16.83	2406	7.85	9.4%	.05%
4	S9R155	4,000	4,000	19.32	19.32	207.00	13.54	.81%	.08%
5	S9R127	2,000	22,000	20.12	221.37	99.38	7.88	.39%	.05%
6	S9R101	13,500	113,500	61.69	518.62	218.85	18.61	.9%	.12%
7	S9R140	64,000	2,324,000	62.26	2,260.70	1028	83.85	4%	.52%
8	S9R175	89,500	89,500	75.00	75.00	1193.25	63.47	4.67%	.39%
9	Shoaf #2	580,000	1,120,000	79.59	153.70	7826.97	748.6	28.5%	4.7%
10	S9R187	26,700	51,700	90.08	174.47	296.33	26.39	1.16%	.16%
11	M9R97	25,000	50,000	91.82	183.64	272.27	28.25	1.1%	.2%
12	M9R60	25,000	150,000	105.62	633.71	236.7	45.08	.9%	.28%
13	M9R200	25,000	25,000	114.82	114.82	217.74	19.29	.9%	.12%
14	M9R10	25,000	25,000	125.55	125.55	199.13	11.77	.8%	.07%
15	M9R28	80,000	2,260,000	128.81	3,616.41	624.93	48.14	2.4%	.3%
16	S9R189	2,700	2,700	129.68	129.68	20.82	3.26	.08%	.02%
17	M9R80	50,000	100,000	152.45	304.90	327.97	34.20	1.3%	.22%

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TABLE 87 (contd.)
 RECOMMENDED ABATEMENT PROCEDURES - COST BENEFICATION
 SUB - WATERSHED
 9R

Rank	Mine No.	TOTAL COSTS		COST \$/POUND ACID REMOVAL		Total Acid Abated	Total Iron Abated	% OF TOTAL SUB-WATERSHED	
		Known Sources	Potential Sources	Known Sources	Potential Sources	PPD	PPD	Acid	Iron
18	S9R166	\$ 3,500	\$ 3,500	\$ 154.94	\$ 154.94	22.59	1.31	.09%	-
19	Irwin Gas & Coal Co. #11 Mine	140,000	600,000	170.58	731.07	820.72	209.07	3.2%	1.3%
20	S9R133	60,800	110,800	187.22	341.19	324.75	13.11	1.27%	.08%
21	M9R201	50,000	50,000	189.11	189.11	264.39	31.97	1%	.2%
22	M9R92	25,000	25,000	189.88	189.88	131.66	5.63	.5%	.03%
23	S9R106	181,000	206,000	194.47	221.33	930.75	119.55	3.6%	.7%
24	M9R91	25,000	25,000	197.89	197.89	126.33	6.93	.5%	.04%
25	M9R208	50,000	50,000	225.46	225.46	221.77	.66	.9%	-
26	S9R103	39,500	459,000	229.68	2,668.92	171.98	13.31	.7%	.08%
27	S9R123	12,800	12,800	235.60	235.60	54.33	12.22	.2%	.08%
28	S9R122	11,600	11,600	262.98	262.98	44.11	3.23	.17%	.02%
29	M9R11	75,000	250,000	290.74	698.40	357.96	41.28	1.4%	.26%
30	M9R204	25,000	25,000	346.21	346.21	72.21	7.37	.3%	.05%
31	M9R205	25,000	25,000	346.64	346.64	72.12	6.70	.3%	.04%
32	S9R181	18,800	43,800	413.73	963.91	45.44	6	.18%	.04%
33	S9R118	135,100	275,100	623.73	1,270.08	216.6	16.43	.85%	.1%

TABLE 87 (contd.)
 RECOMMENDED ABATEMENT PROCEDURES - COST BENEFICATION
 SUB - WATERSHED
 9R

Rank	Mine No.	TOTAL COSTS		COST \$/POUND ACID REMOVAL		Total Acid Abated	Total Iron Abated	% OF TOTAL SUB-WATERSHED	
		Known Sources	Potential Sources	Known Sources	Potential Sources	PPD	PPD	Acid	Iron
34	M9R94	\$ 150,000	\$ 150,000	\$ 627.88	\$ 627.88	238.90	54.17	.9%	.34%
35	S9R105	29,000	29,000	672.07	672.07	43.15	3.17	.17%	.02%
36	S9R188	9,200	9,200	831.07	831.07	11.07	.48	.04%	-
37	M9R20	40,000	120,000	1,101.32	3,303.96	36.32	4.78	.1%	.03%
38	M9R99	25,000	25,000	1,112.10	1,112.10	22.48	.56	.09%	-
39	M9R77	25,000	25,000	1,112.59	1,112.59	22.47	3.11	.09%	.02%
40	S9R120	64,000	64,000	1,153.98	1,153.98	55.46	3.48	.22%	.02%
41	S9R190	27,000	27,000	1,658.48	1,658.48	16.28	.86	.06%	-
42	M9R36	20,000	60,000	2,185.79	6,557.38	9.15	.32	.04%	-
43	M9R82	50,000	50,000	3,154.57	3,154.57	15.85	1.82	.06%	.01%
44	M9R42	25,000	25,000	3,496.50	3,496.50	7.15	1.52	.02%	-
45	M9R84	25,000	25,000	3,521.13	3,521.13	7.10	19.52	.03%	.12%
46	M9R76	25,000	25,000	5,341.88	5,341.88	4.68	.06	.02%	-
47	M9R75	25,000	25,000	5,387.93	5,387.93	4.64	6.15	.02%	.04%
48	M9R93	50,000	125,000	8,833.92	22,084.81	5.66	1.22	.02%	-
49	S9R186	19,800	19,800	14,666.67	14,666.67	1.35	.09	-	-
50	M9R95	25,000	125,000	14,792.90	73,964.50	1.69	.36	-	-

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TABLE 87 (contd.)
 RECOMMENDED ABATEMENT PROCEDURES - COST BENEFICATION
 SUB - WATERSHED
 9R

Rank	Mine No.	TOTAL COSTS		COST \$/POUND ACID REMOVAL		Total Acid Abated	Total Iron Abated	% OF TOTAL SUB-WATERSHED	
		Known Sources	Potential Sources	Known Sources	Potential Sources	PPD	PPD	Acid	Iron
-	BH9R1	\$ See Shoaf	#2 Mine	\$	\$	143.08	8.37	.6%	.05%
-	BH9R2	See Shoaf	#2 Mine			201.61	39.02	.8%	.2%
-	BH9R29	See Shoaf	#2 Mine			62.48	2.57	.2%	.02%
-	M9R23	See Shoaf	#2 Mine			1029	89.81	4%	.55%
-	M9R59	See Irwin Gas & Coal Co.,	#11 Mine			108.76	21.80	.4%	.14%
-	M9R71	See Irwin Gas & Coal Co.,	#11 Mine			8.05	1.30	.03%	-
-	M9R74	See Irwin Gas & Coal Co.,	#11 Mine			685.67	185.03	2.7%	1.15%
-	M9R78	See Shoaf	#2 Mine			985.64	109.53	3.9%	.68%
-	M9R79	See Shoaf	#2 Mine			414.42	35.12	1.6%	.22%
-	M9R88	See Irwin Gas & Coal Co.,	#11 Mine			18.24	.94	.07%	-
-	M9R90	See Shoaf	#2 Mine			366.22	33.44	1.4%	.2%
-	M9R98	See Shoaf	#2 Mine			831.56	77.54	3.3%	.48%
-	M9R202	See Shoaf	#2 Mine			2413.03	299.86	9.4%	1.86%
-	M9R203	See Shoaf	#2 Mine			408.29	32.83	1.6%	.2%
-	M9R206	See Shoaf	#2 Mine			164.43	17.22	.6%	.1%
-	M9R207	See Shoaf	#2 Mine			45.44	2.63	.2%	.02%
-	M9R209	See M9R28				3.61	.75	.01%	-

TABLE 87 (contd.)
 RECOMMENDED ABATEMENT PROCEDURES - COST BENEFICATION
 SUB - WATERSHED
 9R

Rank	Mine No.	TOTAL COSTS		COST \$/POUND ACID REMOVAL		Total Acid Abated	Total Iron Abated	% OF TOTAL SUB-WATERSHED	
		Known Sources	Potential Sources	Known Sources	Potential Sources	PPD	PPD	Acid	Iron
-	M9R210	\$ 25,000	\$ 25,000	\$	\$	82.29	10.25	-	-

TABLE 88
 BENEFICATION - RECOMMENDED PLANS
 SUB-WATERSHED
 9R

Plan	Sources Abated	ACID		IRON		SULFATE		TOTAL CONS'T COSTS	
		PPD	% of Total Sub-Watershed	PPD	% of Total Sub-Watershed	PPD	% of Total Sub-Watershed	Known Sources	Potential Sources
A	50	27,442	107%	1,939	12%	27,724	45%	\$ 2,713,700	\$ 9,775,000
B	36	27,232	106%	1,895	12%	27,183	44%	2,114,700	9,034,200
C	32	26,722	104%	1,821	11%	24,516	39%	1,791,400	8,570,900

It is recommended that Plan "C" be initiated for this Sub-Watershed