GILMORE RUN

GILMORE RUN SUBWATERSHED

Gilmore Run is located in the north-central portion of the Big Scrubgrass Creek Watershed. Brink Run and Peterson Run, two small tributaries of the main stream, drain parts of mines which are associated with Gilmore Run, and so these three are included together as one subwatershed. The total drainage area measures 5.31 square miles. Samples taken during the period from March, 1971, to August, 1972, indicate that this area produces an average of about 2250 pounds of acid per day, making it the largest source of acid pollution to Big Scrubgrass Creek.

Sampling Station No. 10 on Gilmore Run is below most of the pollution sources. There are 2.96 square miles of drainage area above this station including approximately 0.8 square miles of strip mine area. Figure 40 shows the pH of samples taken at this station during the sampling period. Figure 41 shows the acid content of these samples in parts per million. The average acid content of Gilmore Run at this point during the sampling period was 78.0 parts per million with a high of 140 ppm and a low of 40 ppm. The low acid level occurred during the flood period of late June, 1972, when high runoff volume caused dillution of the pollution. The average discharge during the period, as determined from flow measurements made at the time of sampling, was 890 gpm. This average does not include the June, 1972, measurement which was obviously unusually high. The average acid discharge

ACID MINE DRAINAGE PROJECT
BIG SCRUBGRASS CREEK WATERSHED

SAMPLING STATION NO. 10

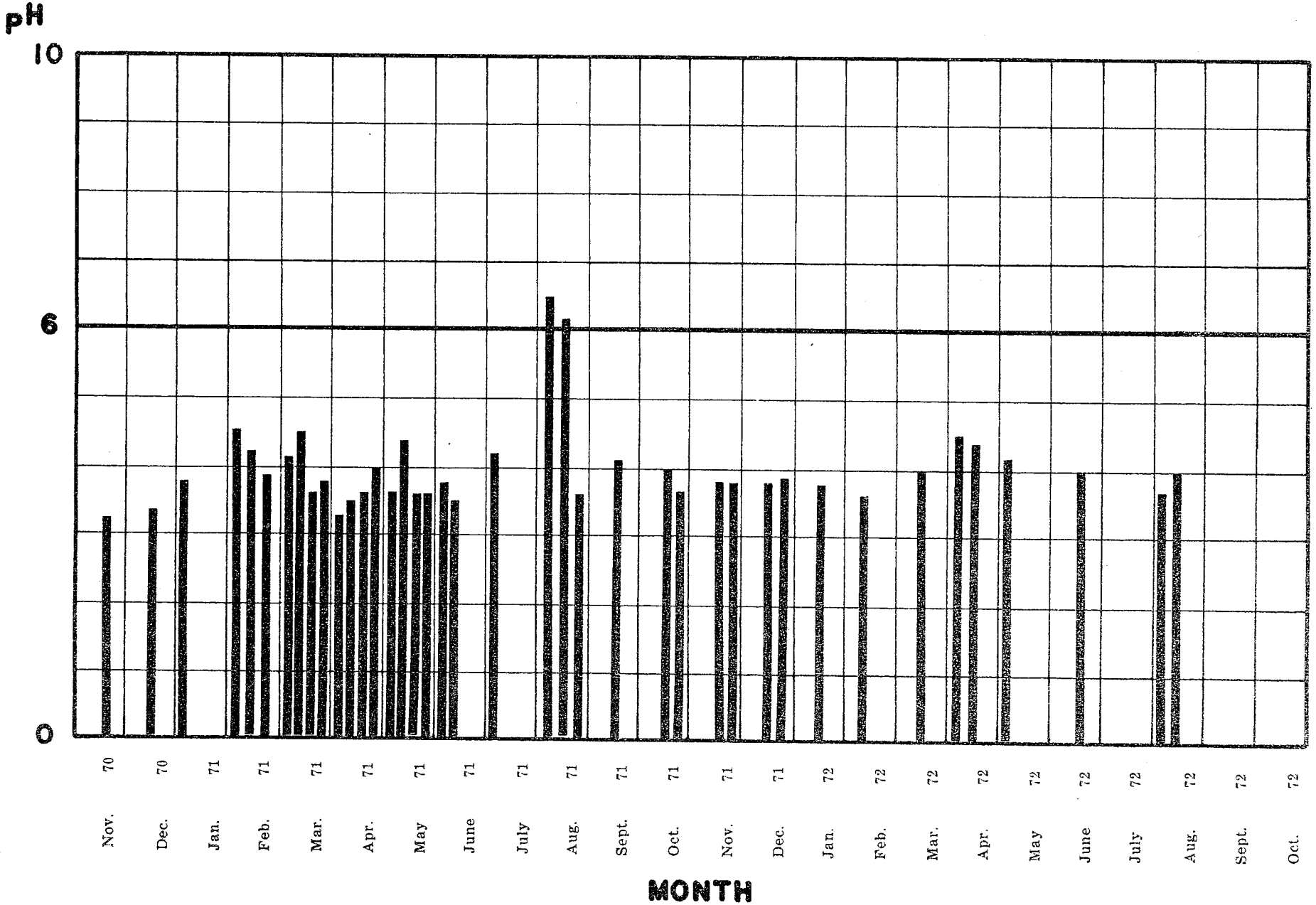


FIGURE 40

ACID MINE DRAINAGE PROJECT
BIG SCRUBGRASS CREEK WATERSHED

SAMPLING STATION NO. 10

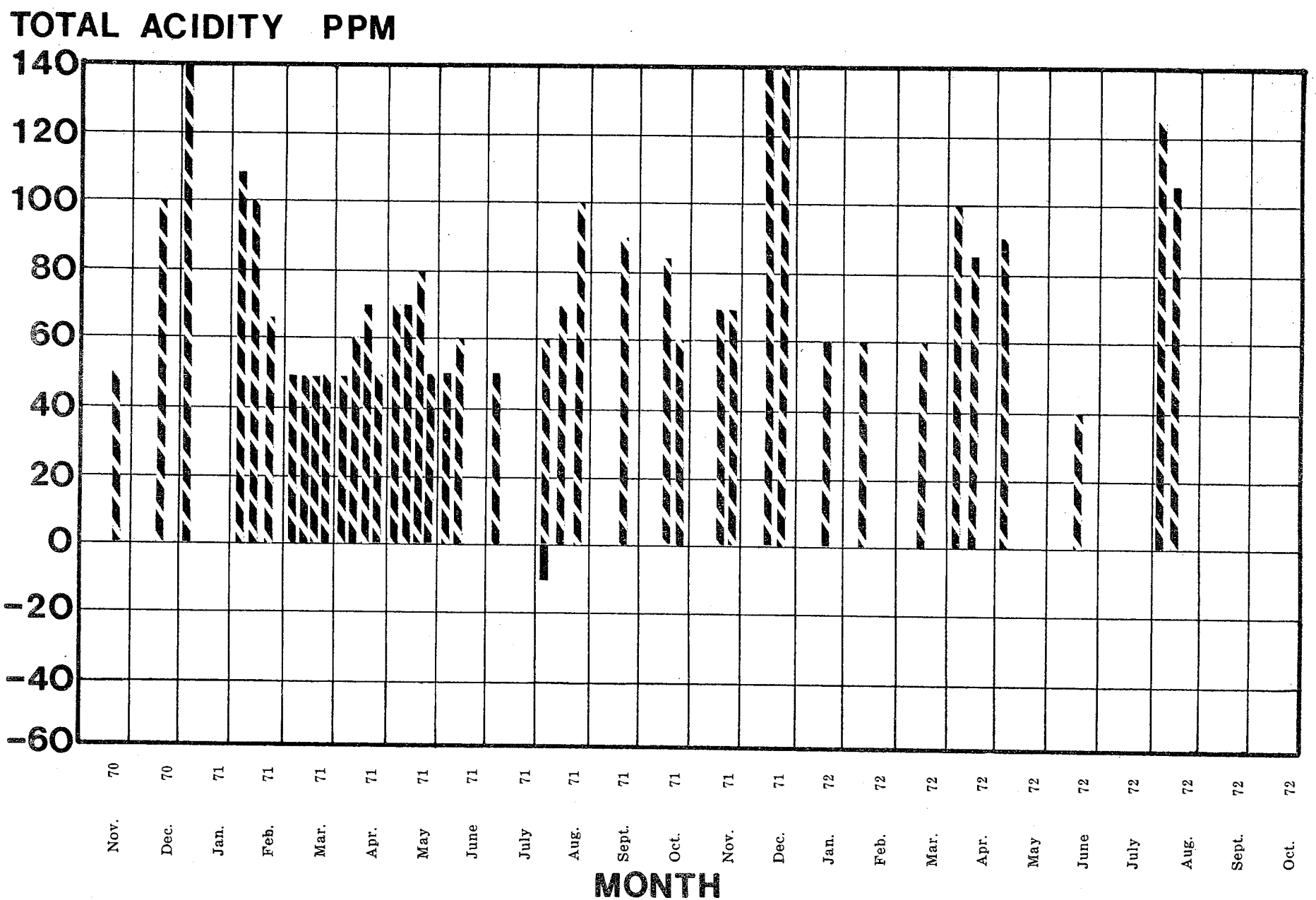


FIGURE 41

at this station was determined to be 714 pounds per day. Hydrologic analysis of this drainage area indicates that the actual average acid discharge at this point could be even higher than this. The watershed is small with steep slopes and a high percentage of steep bare soil which would undoubtedly cause storm runoff hydrographs which have a very short time base and high peak flows. The average annual runoff for USGS stream gages in the region ranges between 18 and 23 inches per year. An average annual runoff of 20 inches from this watershed would give an average flow rate of 1957 gpm. Even assuming the lowest acid content measured of 40 parts per million as the average for the year gives an average acid discharge of 939.5 pounds per day. Continuous sampling on the flows might substantiate this estimate. However, periodic sampling as was done for this project probably missed most of the peaks and obtained samples from the recession limb of the storm hydrographs or from base flow when flows rates were lower and acid concentrations higher.

Sampling Station No. 45 collects flows from the eastern part of Mine Site No. 17, and the southern part of Mine No. 18. The average discharge, not counting the June, 1972, flood flows, was 456 gpm with 1402 pounds per day acid. Hydrologic analysis of this watershed indicates that this is probably a good estimate of the long-term average discharge. This one area is the worst source of pollution to Big Scrubgrass Creek. Figures 42 and 43 show the pH values and Total Acidity in parts per million obtained from this station.

ACID MINE DRAINAGE PROJECT
BIG SCRUBGRASS CREEK WATERSHED

SAMPLING STATION NO. 45

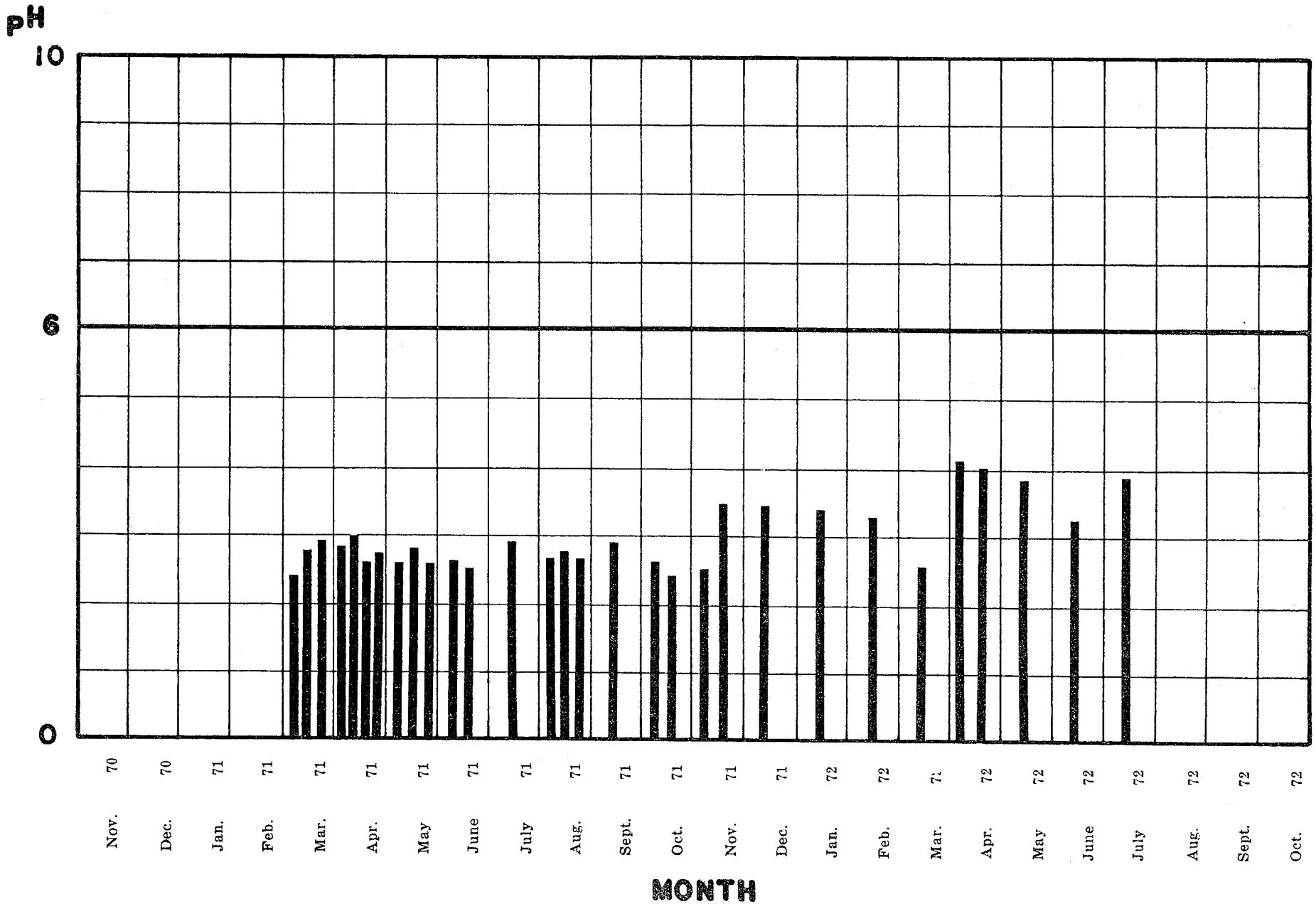


FIGURE 42

ACID MINE DRAINAGE PROJECT
BIG SCRUBGRASS CREEK WATERSHED

SAMPLING STATION NO. 45

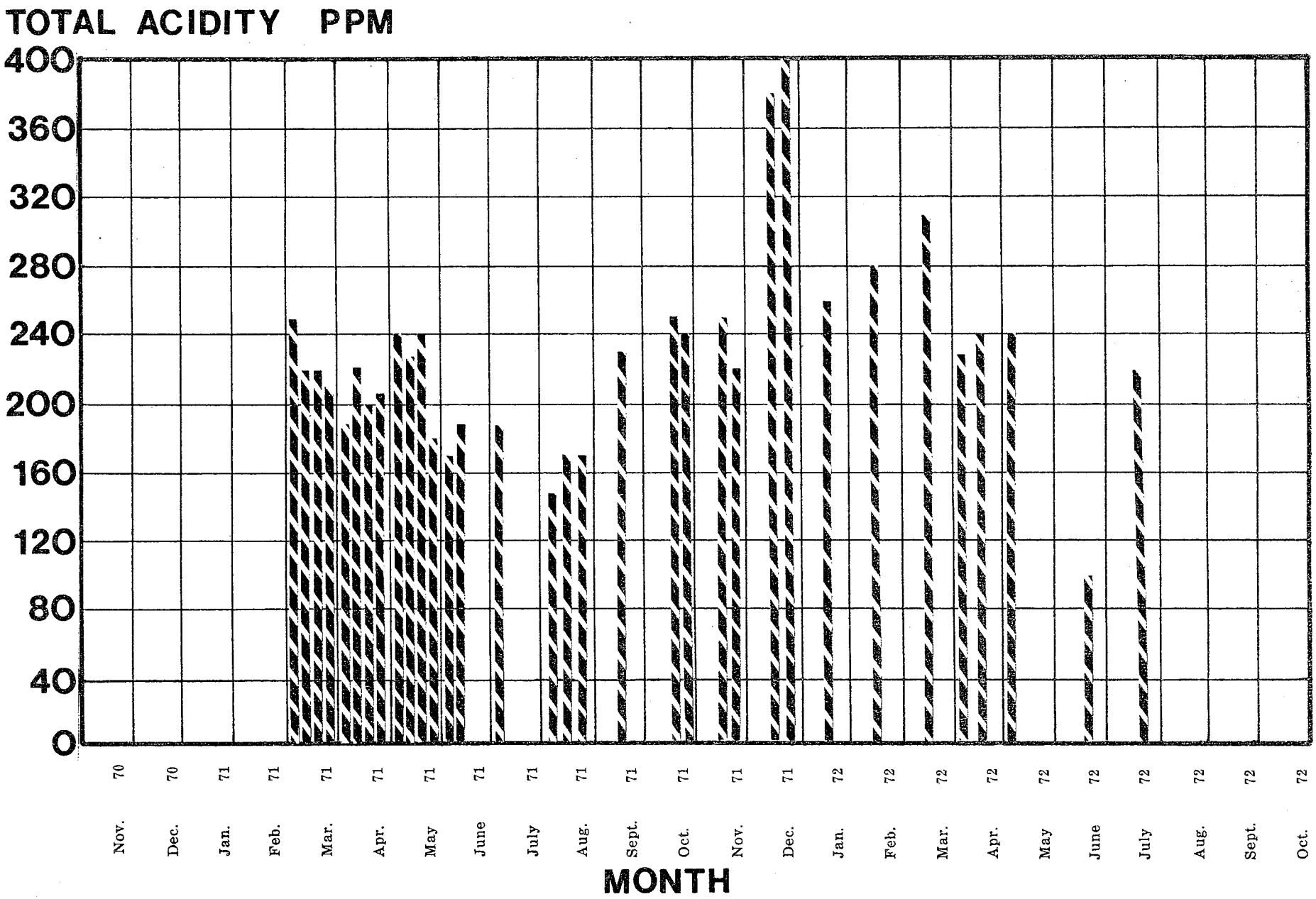


FIGURE 43

Additonal data on these sampling stations is included in Appendix B of this report. The data does not indicate any one type of flow to be more serious than another since low flows during dry periods had high concentrations and high flows such as the June, 1972, flood period had lower concentrations but high total volume. All samples taken in this watershed had some degree of pollution. Only water samples taken in areas with adequate vegetative cover for soil erosion control had good quality.

Six water quality sampling stations were set up in the Gilmore Run area. The location, drainage area and summary of water quality test results are contained in the following discussion. The location of the sampling stations are shown on the map, Figure 44.

Station No. 8 was located at the south end of a concrete culvert on Henderson Run under Township Road 335, 1 mile west of Pa. Route 308. This station has a drainage area of 0.43 square miles and collects flows from Mine Site No. 13 and No. 15, contributing the largest portion of mine drainage infected water into Gilmore Run downstream. There was very little variation in water quality during either high flow periods or low flow periods. Station No. 8 was sampled 40 times between November 20, 1970, and August 9, 1972. Following are the average, maximum, and minimum values indicated by the water quality tests.

	Average	Maximum	Minimum
Flow (gpm)	181.0	18890	5.75
pH	3.2	3.7	2.5
Total Acidity (ppm)	255.0	410.0	50.0
Alkalinity (ppm)	0.0	0.0	0.0
Iron (ppm)	2.48	6.75	0.6
Sulfates (ppm)	633.0	1000.0	65.0
Acid (ppd)	637.0	11330	21.0
Alkalinity (ppd)	0.0	0.0	0.0
Iron (ppd)	6.5	57.0	0.2
Sulfates (ppd)	1502.0	22670.0	46.0

Station No. 9 was established at the south end of a C.M.P. culvert under Township Road 355, 1.5 miles west of Pa. Route 308. Gilmore Run at this point has a drainage area of 0.40 square miles and receives flows from Mine Site No. 13. There are numerous acid seeps and pools in the mined area, all of which collect at this station. Flow variation at this point was widespread throughout the project period and displayed very little effect on the water quality. Between November 20, 1970, and August 8, 1972, this station was sampled 41 times resulting in the following average, maximum and minimum values.

	Average	Maximum	Minimum
Flow (gpm)	153.0	17570	14.0
pH	3.4	4.3	2.7
Total Acidity (ppm)	151.0	300.0	50.0
Alkalinity (ppm)	0.0	0.0	0.0
Iron (ppm)	1.29	3.3	0.2
Sulfates (ppm)	198.0	290.0	65.0
Acid (ppd)	291.0	12650	16.0
Alkalinity (ppd)	0.0	0.0	0.0
Iron (ppd)	2.49	74.0	0.1
Sulfates (ppd)	380.0	13700	24.0

Station No. 10 on Gilmore Run is below most of the acid mine drainage sources. It is located at the south end of two culverts under Township Road 325, 1.8 miles east of L.R. 60003. There are 2.96 square miles of drainage area above this station including approximately 0.8 square miles of strip mine area. Mines No. 13, No. 14, No. 15, No. 16, No. 17, and No. 26 contribute flow through this station. All but two water samples taken at this station were below pH 6.0 and most were below 4.0, with no particular seasonal variation indicated. Station No. 10 was sampled 41 times between November 20, 1970, and August 11, 1972, and the following are the indicated average, maximum, and minimum water quality determinations.

	Average	Maximum	Minimum
Flow (gpm)	892.0	135000	85.0
pH	4.0	6.5	3.2
Total Acidity (ppm)	78.0	140.0	40.0
Alkalinity (ppm)	0.2	10.0	0.0
Iron (ppm)	2.05	8.0	0.15
Sulfates (ppm)	257.0	810.0	80.0
Acid (ppd)	714.0	64800	60.0
Alkalinity ppd)	0.0	0.0	0.0
Iron (ppd)	16.6	88.0	0.4
Sulfates (ppd)	2325	129600	300.0

Station No. 45 was located on Brink Run at the southern end of a concrete box culvert under Pa. Route 308, 0.4 miles south of the intersection with L.R. 60011. Station No. 45 collects flows from the eastern edge of Mine Site No. 17 and has a drainage area of 0.55 square miles. The water quality found at this station during the sampling period was the worst of all sampling points in the entire Big Scrubgrass Creek Watershed. This area above Station No. 45 is probably the worst single source of pollution to Big Scrubgrass Creek. Between March 3, 1971, and July 20, 1972, this station was sampled 34 times. Following is the average, maximum and minimum values indicated by the water quality tests.

	Average	Maximum	Minimum
Flow (gpm)	457.0	2065.0	16.0
pH	3.1	4.1	2.4
Total Acidity (ppm)	231.1	400.0	100.0
Alkalinity (ppm)	0.0	0.0	0.0
Iron (ppm)	4.57	9.0	0.75
Sulfates (ppm)	569.0	1025.0	148.0
Acid (ppd)	1402.0	5600.0	50.0
Alkalinity (ppd)	0.0	0.0	0.0
Iron (ppd)	22.0	88.0	1.2
Sulfates (ppd)	3461.0	14870.0	100.0

Station No. 51 was established at the south end of a drainage pipe about 200' upstream from the point where Big Scrubgrass Creek passes under Pa. Route 308, approximately one mile north of the intersection with Pa. Route 208 at Clintonville. This station measures 0.02 square miles of drainage area and collects flows from natural sources, i.e., field drainage, drainage ditches, etc. It was net alkaline for the duration of the sampling period except for the final sample. Between March 9, 1971, and May 4, 1972, this station was sampled 18 times. Following is a list of average, maximum and minimum water quality values.

	Average	Maximum	Minimum
Flow (gpm)	22.0	40.0	14.0
pH	6.6	6.9	5.9
Total Acidity (ppm)	5.0	10.0	0.0
Alkalinity (ppm)	18.0	30.0	10.0
Iron (ppm)	0.05	0.1	0.05
Sulfates (ppm)	9.0	15.0	5.0
Acid (ppd)	1.2	2.4	0.0
Alkalinity (ppd)	4.7	8.4	2.0
Iron (ppd)	0.01	0.03	0.0
Sulfates (ppd)	2.4	4.7	0.9

Station No. 59 was established on Peterson Run about 50' south of where the stream passes under Township Road 325, 0.2 miles west of intersection with Pa. Route 308. The drainage area of this station measures 0.07 square miles, including the southwestern end of Mine Site No. 17. Peterson Run at this point was not a heavy flowing stream, in fact ran dry on occasions. It was a heavily polluted stream collecting flows from numerous seep discharges in Site No. 17. Between March 9, 1971, and August 9, 1972, this station was sampled 32 times. Following is a list of average, maximum and minimum water quality values.

	Average	Maximum	Minimum
Flow (gpm)	57.0	278.0	0.0
pH	3.36	4.6	2.8
Total Acidity (ppm)	177.0	220.0	90.0
Alkalinity (ppm)	0.0	0.0	0.0
Iron (ppm)	2.7	6.5	0.4
Sulfates (ppm)	239.0	340.0	155.0
Acid (ppd)	133.0	500.0	0.0
Alkalinity (ppd)	0.0	0.0	0.0
Iron (ppd)	0.88	2.6	0.0
Sulfates (ppd)	172.0	840.0	0.0

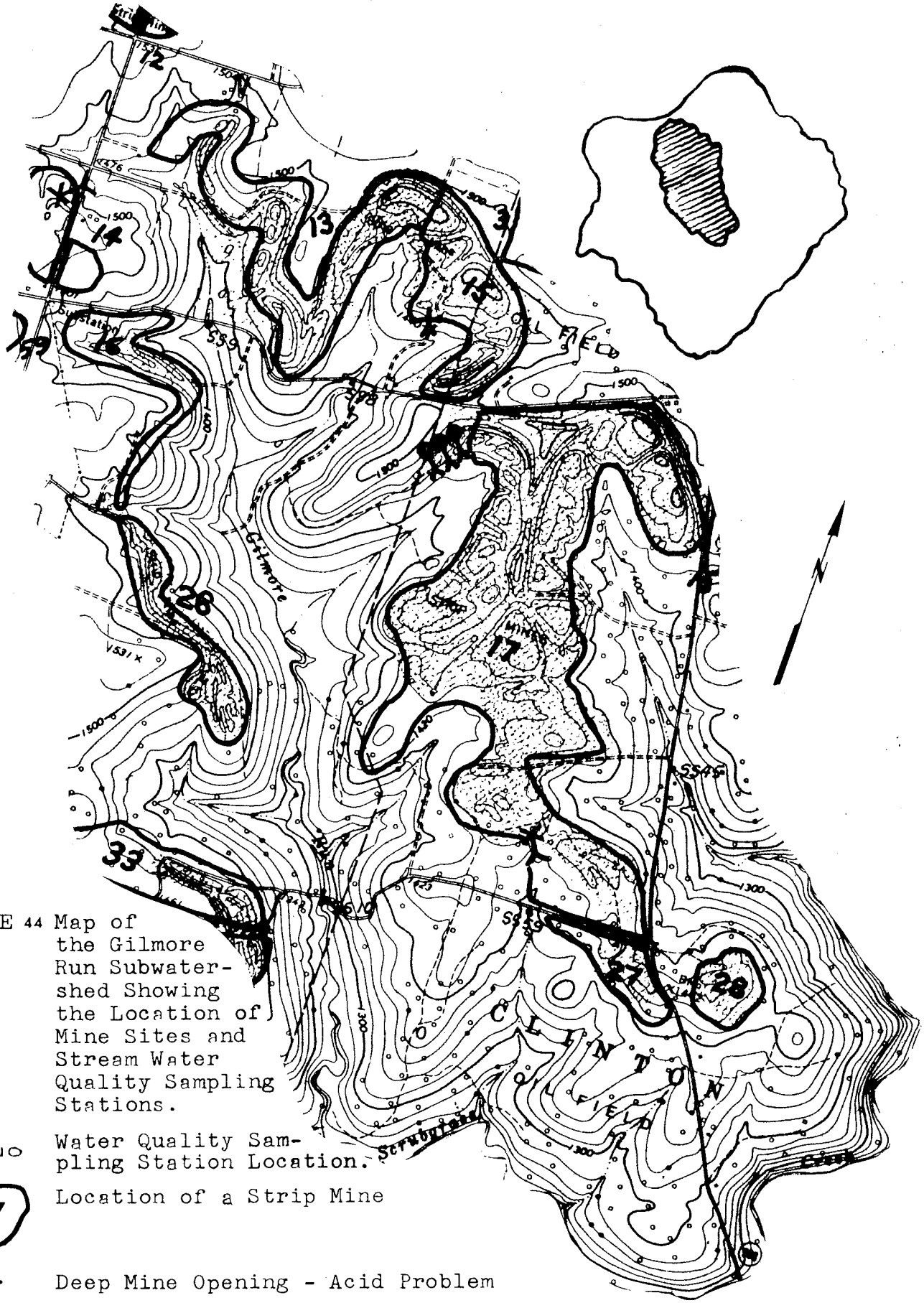


FIGURE 44 Map of the Gilmore Run Subwatershed Showing the Location of Mine Sites and Stream Water Quality Sampling Stations.

•SS 10 Water Quality Sampling Station Location.

17 Location of a Strip Mine

Deep Mine Opening - Acid Problem

Deep Mine Opening - No Acid Problem

Deep Mine Opening - Workings Stripped Out

Air Shaft

SCALE: 1:24000

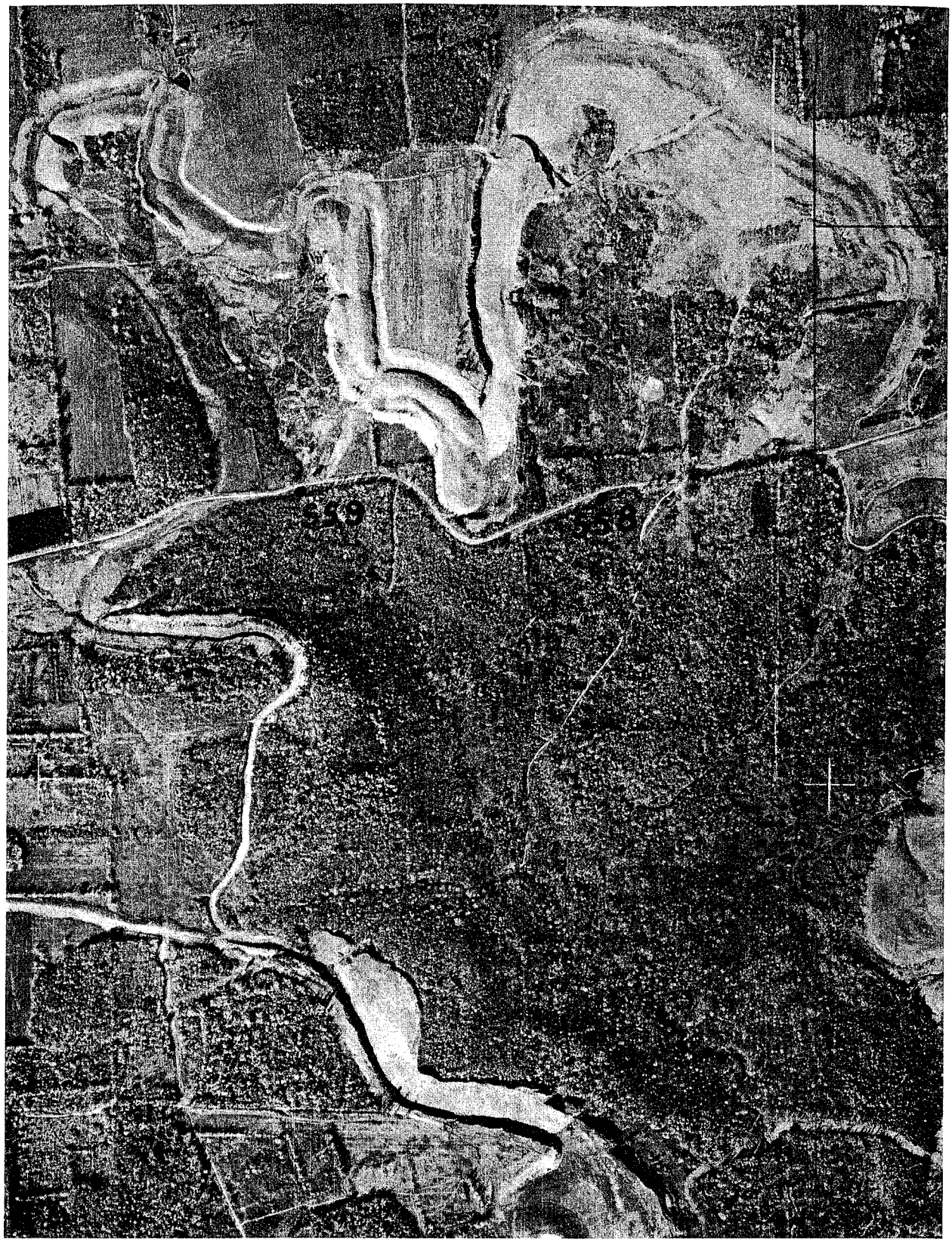


Figure 45 . Aerial Photo Showing
Mine Sites Nos. 13, 15, 16 and 26.
Scale: 1 in. = 1000 ft.

Figure 46 . Aerial Photo Showing
Mine Site No. 17. Scale: 1 in. = 1000 ft.

Specific Reclamation Plans for the Gilmore Run Subwatershed:

Four strip mine sites lie completely within the Gilmore Run Subwatershed. Three others lie on the watershed divide and two more lie just outside the watershed divide in the Brink Run and Peterson Run drainage areas. These nine mine sites cover a total of 804 acres of approximately 37 percent of the total mining of the Big Scrubgrass Creek Watershed. Figure 44 is a map of this area with the mine locations. The approximate location of five deep mine openings were found in strip mine permit applications for this area. The four shown on Mine Site No. 17 could not be found during extensive field exploration, suggesting that they were probably small and were removed during the stripping. Some seepage was found on Mine No. 15 near the location where the old deep mine was reported although no surface evidence was found. The recommendations for this area were submitted to the Pennsylvania Department of Environmental Resources as a Quick Start Project.

The reclamation work recommended here is aimed at an estimated 98 percent of the pollution sources on this subwatershed. Evidence gathered from periodic sampling of seeps and pools within the mined areas where this type of reclamation had already been applied indicates that implementation of these measures should be at least 75 percent successful. Thus the implementation of these measures should produce at least a 74 percent reduction in the pollution load from this area. This means a reduction of about 1800 pounds of acid below

present average discharge levels from the three tributary streams involved. Periodic follow-up application of lime and fertilizer over the next ten to twenty years are recommended to insure continued success until a natural balance is reached between the sod forming and erosion processes. These periodic applications are not anticipated to be required frequently. The anticipated reduction in pollution would cause a major improvement in the water quality of the main stream below this area.

Figure 30 is the key to the symbols used or the mine site maps.

SITE 13

This site includes 87.5 acres of strip mine in the extreme upper end of the Gilmore Run Subwatershed. The site is extremely rugged with the highest highwalls and most rocky cuts of any mine in the entire Big Scrubgrass Creek Watershed. Samples of the spoil material were all below pH 4.0. All runoff and seepage from this mine site passes through Sampling Station No. 9, which had an average acid discharge of 277 pounds per day.

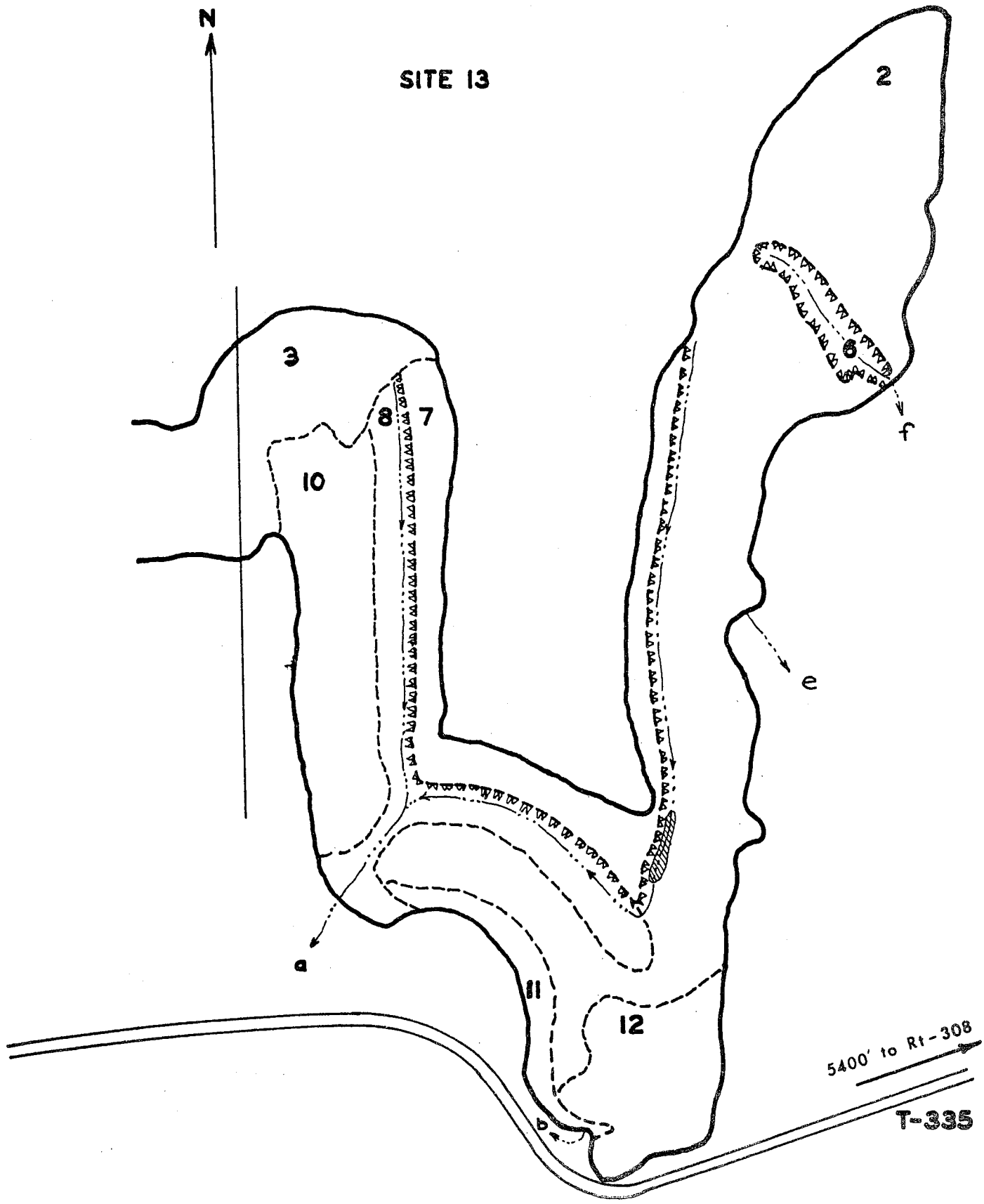
Areas #3, #9 and #12 cover 19.7 acres which are not acid sources and need no additional work.

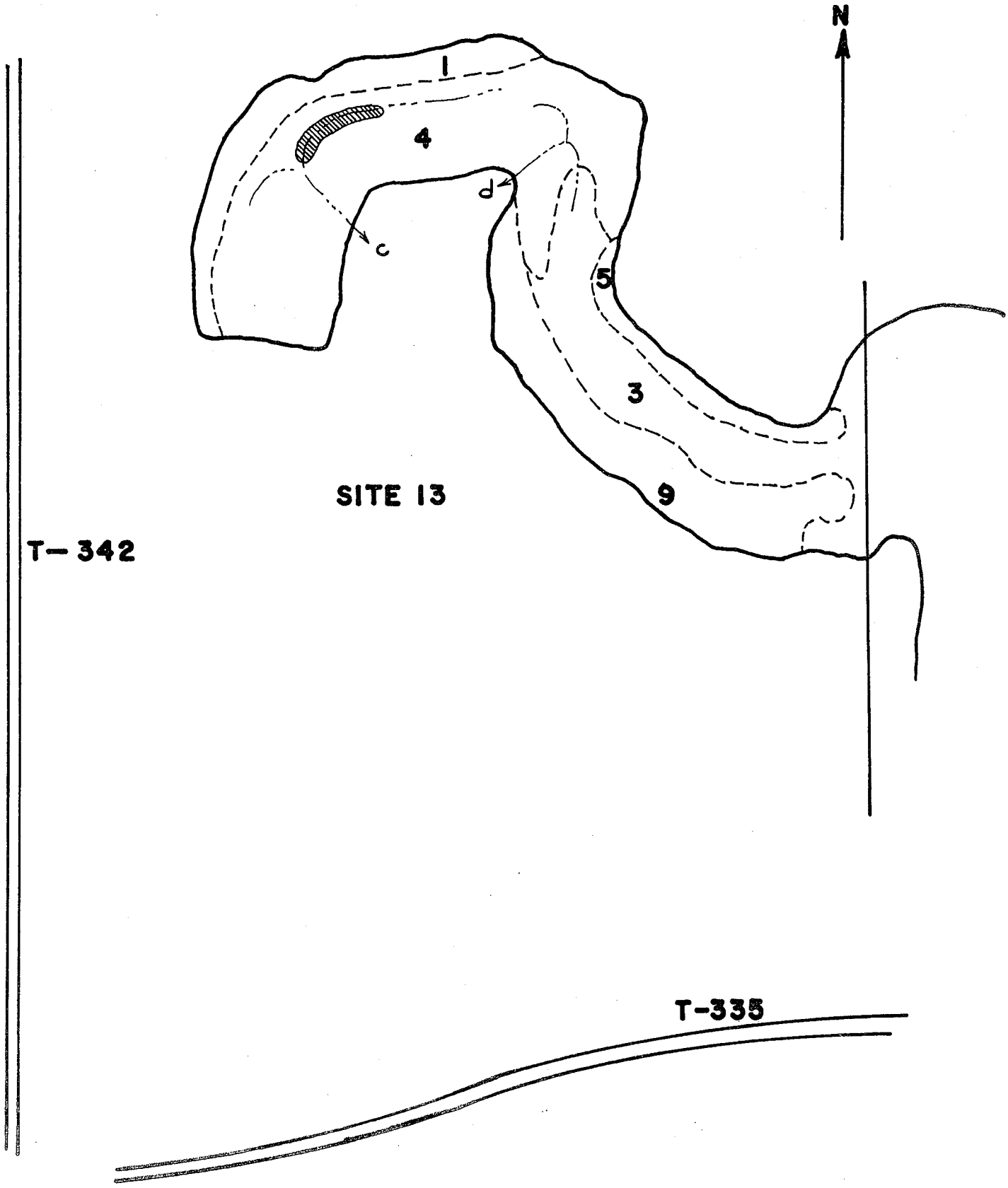
Areas #2, #4, #6, #8, #10 and #11 cover 57.1 acres of final cut and spoil piles (See Figure 12). The spoil and cut are bare with a pH between 3 and 4. Small pools within the final cut area hold acid water high in sulfates. Some Bristly Locust has been planted in Areas #4 and #6 which have not reduced the acid production. These areas should be regraded using a terrace backfill and then reseeded using revegetation Method No. 1.

Areas #1, #5 and #7 cover 10.7 acres above the highwalls. These areas have acid material which is eroding and contributing to the AMD from the mine. Diversions should be constructed at the upper edge of these areas to keep water out of the mine and planted using revegetation Method No. 5.

Estimated Cost of Reclamation:

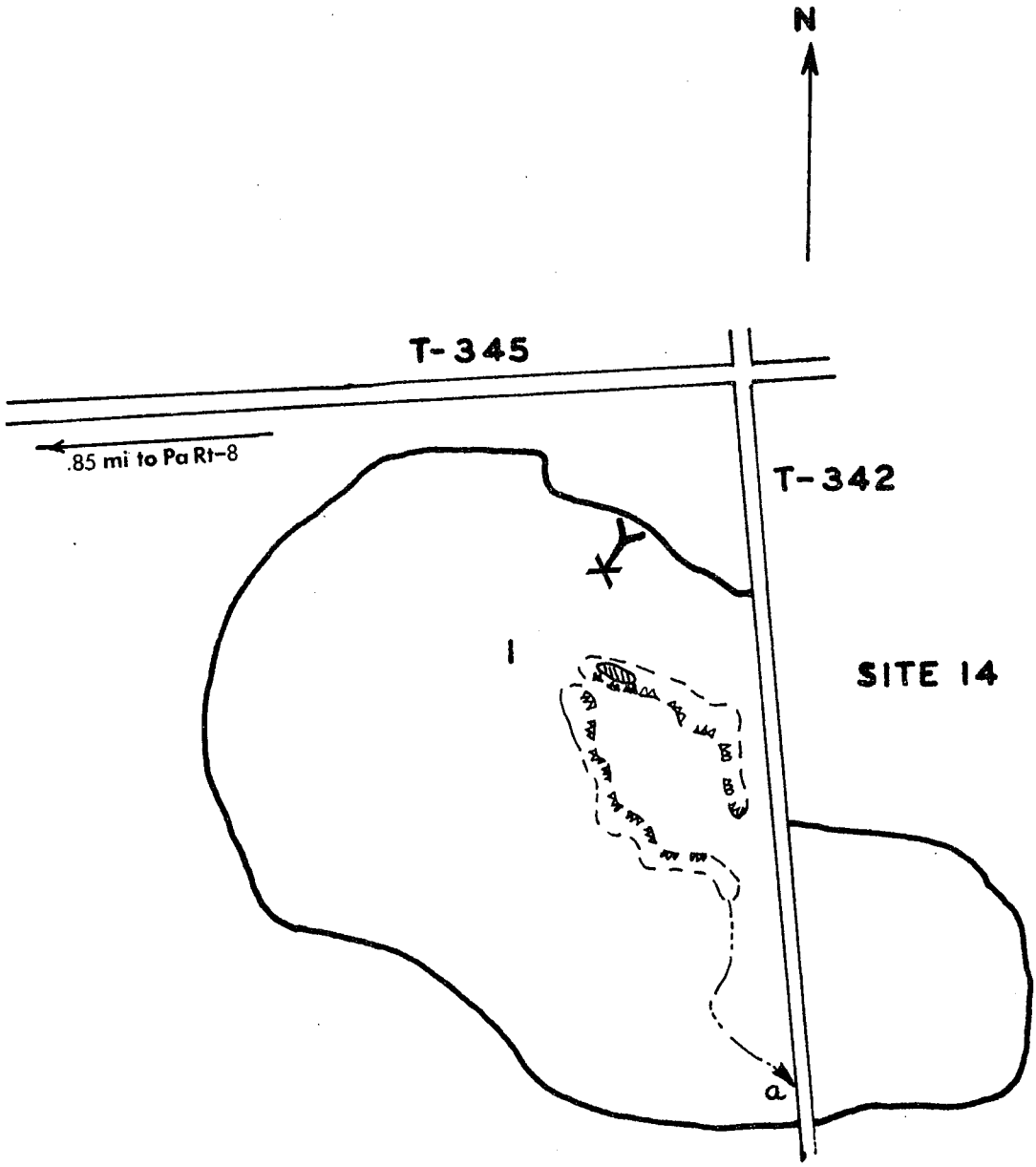
Areas #2, #4, #6, #8, #10 and #11	
57.1 acres of terrace backfilling	$57,100
57.1 acres of revegetation Method No. 1	17,100
Areas #1, #5, #7	
5000 feet of diversions	5,000
10.7 acres of revegetation Method No. 5	2,500
TOTAL	$81,700


N
SITE 13
2
3
8
7
10
6
f
e
a
11
12
5400' to Rt-308
T-335
b


N
1
4
d
c
5
3
9
SITE 13
T-342
T-335

SITE 14

This strip mine site covers 36.4 acres and has a fairly dense cover of pine and other volunteer trees. The terrain is very rough and spoil tests indicate a pH of 5.0. One small pool within the area contained fairly high amounts of acid and sulfates. The site lies within a wooded area and no regrading is recommended. One deep mine opening was reported in the northeast portion of this site, but the strip mining has completely eliminated any evidence of the old working. Since no important seeps were identified with this site, no reclamation measures are recommended.


N
T-345
.85 mi to Pa Rt-8
T-342
SITE 14
1
a

SITE 15

This site includes 83.3 acres of strip mine and one old deep mine area. The strip mine is a continuation of the strip mine on Site No. 13. Drainage from all points on .this site combine with drainage from points "e" and "f" on Mine No. 13 and flow through Sampling Station No. 8 which had an average acid discharge of 552 pounds per day. Seepage from an old deep mine opening on the hillside at the central part of this mine was reported in a mine drainage permit application on file for this area. Some old deep mine gob is evident along one of the access roads and one wet weather seep was located with a high acid content which may have been a mine drainage tunnel or air shaft.

Areas #1, #3, and #8 cover 7.8 acres of steep, severely gullied land on the uphill side of the mine which have been partially sodded but still produce acid storm runoff. Diversion channels should be established above these areas to reduce the surface runoff into the mine, the gullies should be filled and the slopes should be reseeded using revegetation Method No. 2. A lined channel should be constructed to outlet the diversion and carry the water through the mined area.

Areas #2, #4 and #5 consist of 12.9 acres comprising the top and inner slopes of a large spoil pile area. Area #4 is almost completely bare and has steep, eroded outer slopes. Area #2 is the inner slope which has a partial cover of sod and trees. Area #5 is a deep outlet gully with steep sides. The runoff that comes from these areas through area #5 has a pH of 3.9 with high acid and sulfate content. This area should be regraded to a terrace type backfill and then seeded using revegetation Method No. 1.

Area #6 and #7 cover 41.1 acres of partially regraded strip mine spoil which has some sod and some plantings of White Birch trees. About half the area is completely bare and the area with Birch trees is completely bare under the trees. These areas are producing acid storm runoff. Revegetation Method No. 1 should be used on about one-third of the area which is bare and open and revegetation Method No. 2 should be used over the existing tree cover on another third of the area.

Areas #9 and #10 cover 20.5 acres which have good sod cover. However, during wet weather a pond develops in the old cut area. The surface runoff which passes through point "e" in area #9 is fairly good quality water. However, seepage on the west side at point "d" is acid and suggests that possibly this area was once disturbed by the old deep mine workings. Several factors point to the conclusion that the acid did not begin flowing from the area until after the strip mining was done, and drainage of the final cut area to prevent ponding during wet weather should eliminate the main source of water for the seep. Selected grading for drainage followed by reseeding of the disturbed areas using revegetation Method No. 1 is recommended.

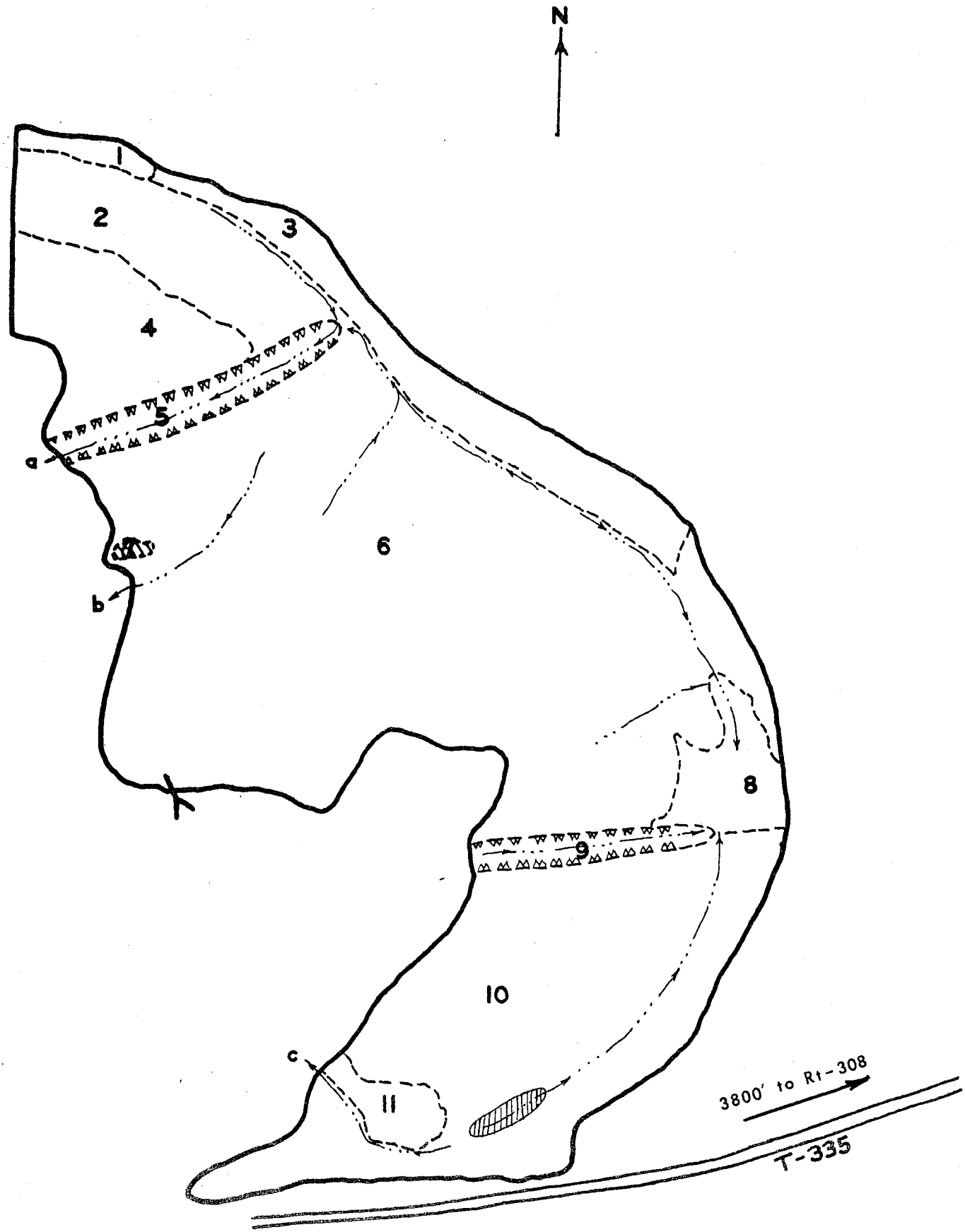
Area #11 is a fairly level area covering 1.1 acres of bare acid spoil which is a source of acid storm runoff. The area should be covered using revegetation Method No. 1.

The seep at point "f" is probably one of the openings to the old deep mine and was found to be producing acid at a rate of approximately 50 pounds per day during one wet period. This opening should be investigated in detail and a hydraulic seal designed and installed.

Estimated Cost of Reclamation:

Areas #1, #3 and #8	
7.8 acres of selected grading for gully control including construction of diversions	$4,600
400 feet of lined drainage channel	2,000
7.8 acres of revegetation Method No. 1	4,600
Areas #2, #4 and #5	
12.9 acres of terrace backfilling	12,900
12.9 acres of revegetation Method No. 1	3,800
Areas #6 and #7	
14 acres of revegetation Method No. 1	4,200
14 acres of revegetation Method No. 2	8,400
Areas #9 and #10	
5 acres of selected grading	3,000
5 acres of revegetation Method No. 1	1,500
Area #1	
1.1 acres of revegetation Method No. 1	300
Sealing one deep mine opening	20,000
TOTAL	$65,300

SITE 15



SITE 16

This site covers 18.3 acres which includes the strip mine, and access roads and a strip excavated for the stripping machine to move on to the next mining area. Seepage from points "a" and "b" flow into Gilmore Run below Sampling Station No. 9. The spoil pH ranges from 4.6 to 5.2 and seepage from point "b" was found to discharge more than 20 pounds of acid per day.

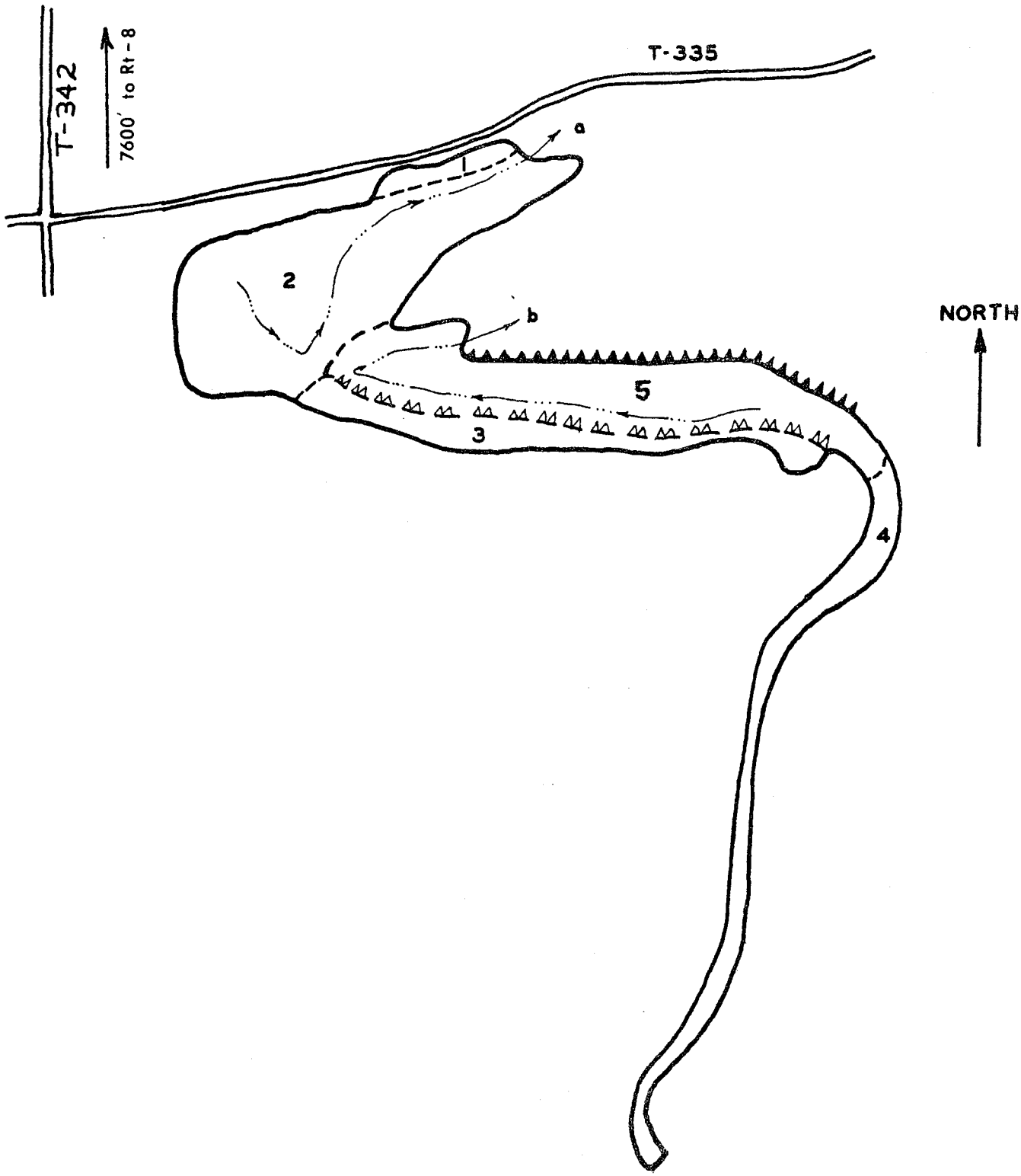
Areas #1, #2 and #4 cover 10.5 acres which are not producing any measurable quantity of acid and no reclamation is recommended.

Areas #3 and #5 cover 7.8 acres of highwall and partially regraded spoil material. Selected grading is needed to provide adequate drainage in the old cut area and eliminate gullies which have formed in the acid spoil causing accelerated acid formation. A diversion should be constructed above the area to keep unpolluted runoff water away from the acid spoil on the mine. All disturbed areas should then be seeded using revegetation Method No. 1.

Estimated Cost of Reclamation:

Areas #3 and #5	
5 acres of selected grading	$3,000
1500 feet of diversion channel	1,500
7.8 acres of revegetation Method No. 1	2,300
TOTAL	$6,800

SITE 16



SITE 17

Mine Site No. 17 covers 347.8 acres and is the largest single strip mined area in the Big Scrubgrass Creek Watershed. Some deep mining was reported in the area in mine drainage permits, although no surface evidence of any deep mining remains today.

Drainage from this Site flows into three different tributaries, Gilmore Run, Brink Run and Peterson Run. Large amounts of storm runoff appear to flow west into Gilmore Run as evidenced by the large sediment deposits at the edge of the mine, and the acid content of this sediment would suggest that this surface runoff is highly acid. However, the volume of dry weather seepage in Gilmore Run from this site is small, though quite polluted. The eastern and southern parts of this site lie in areas of high natural seepage which show up as swamps on older aerial photos of the area. This natural seepage has become acid since the area was stripped and much of the seepage flows through Sampling Station No. 45 carrying about 1300 pounds of acid per day. Additional seepage flows south through Sampling Station No. 59 which had an average acid discharge of 133 pounds per day.

Area #1 covers 137.4 acres which includes a large portion of the northern half of the mine. The area has been partially regraded and has a fair cover of grass and volunteer trees. Pools in the extreme northern part of this area have good quality water in them, indicating unpolluted storm runoff in that area. Pool area #11 which lies in the central portion receives storm runoff from bare eroding spoil and is acid. This pool has no outlet except evaporation and seepage and undoubtedly contributes to acid seeps on this mine. The outer slopes of the area are steep, bare and eroded and appear to be sources of acid storm runoff. At the eastern edge of

of this area along Route 308 is an area of extremely acid seepage which emerges over a fairly large area. Since there is evidence of possible deep mining across the road on Mine Site No. 18, this area could have been disturbed also and some drilling and pressure testing should be done to determine if a grout curtain would be beneficial. If the tests prove positive a hydraulic seal is recommended.

Areas #2, #12 and #13 cover 31.1 acres. These areas are rolling acid spoil which have scattered patches of sod and trees. Numerous large gullies have formed in these areas which have deposited acid silt at the edge of the mine and carry acid seepage and acid storm runoff. Selected grading should be done to provide an adequate water handling system including diversions and waterways and the area should be replanted using revegetation Method No. 1.

Areas #3, #14 and #21 cover 81.7 acres of bare acid spoil which has been regraded but which are souces of acid runoff during storms. These areas can be seeded with revegetation Method No. 1 to stop the acid runoff.

Areas #4, #5, #6, #7, #8, #9, #10, #11, #15, #17 and #22 cover 24.1 acres. These areas are scattered throughout the mine and are deep gullies with bare, steep sides. A permanent acid pool is in area #11. These areas are sources of much acid during storm runoff and small acid seeps continue into dry weather in some. Selected regrading should be done to these areas to fill in the gullies, eliminate the acid pool and provide positive surface drainage of all areas. The slopes should be reduced to no greater than 3:1 and the areas should be reseeded using revegetation Method No. 1.

Areas #16 and #18 cover 13.2 acres of gently rolling spoil material with about 50 percent bare area which contributes to acid runoff during storms. An area of heavy seepage exists on the southeastern edge of Area #18 (See Figure 47). If this does not clear up after surface reclamation of the area it should be investigated by drilling to determine if the area was disturbed at one time by deep mining. For the present the area should be seeded using revegetation Method No. 1 to reduce the acid storm runoff.

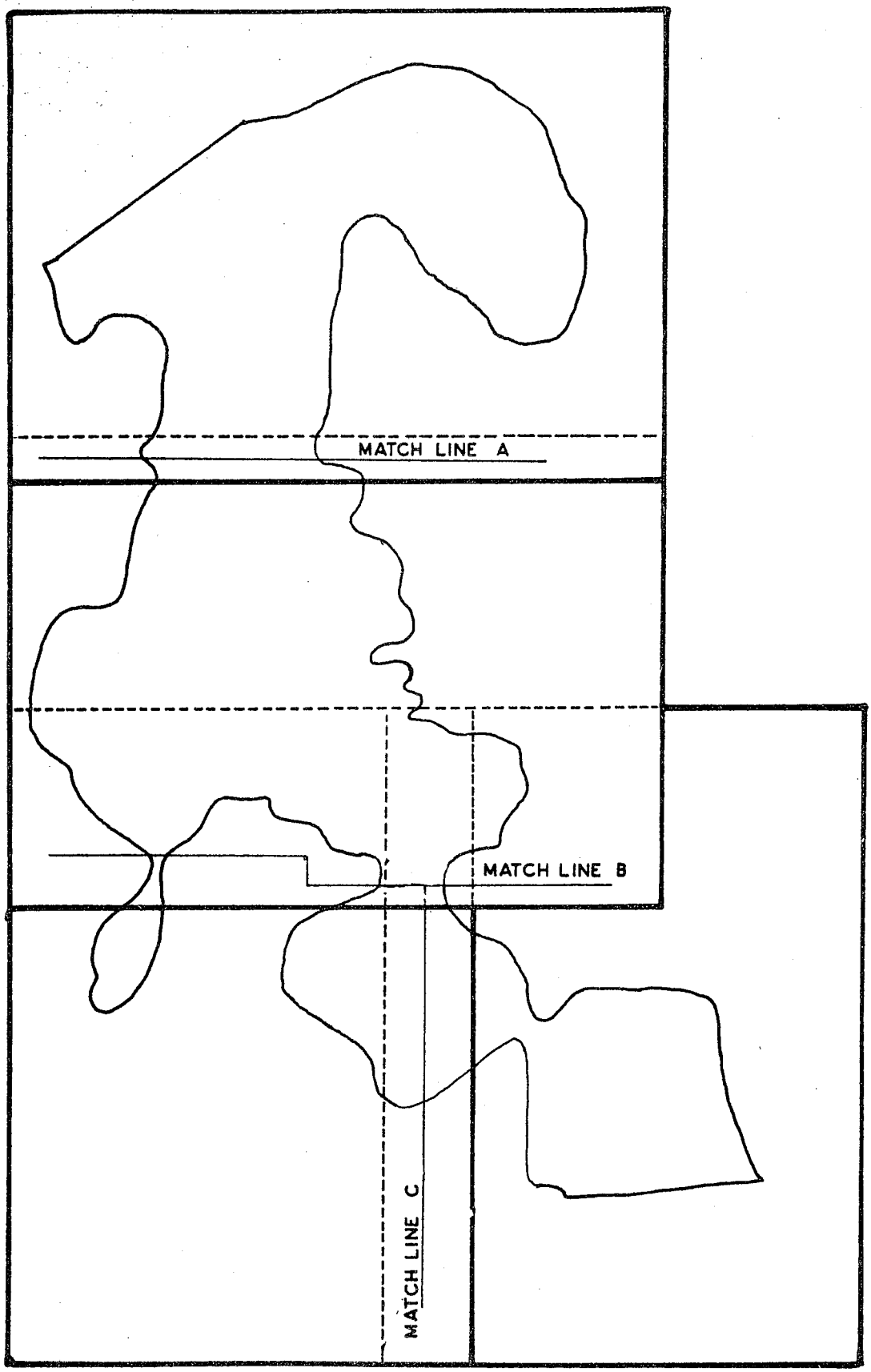
Areas #19 and #20 cover 60.3 acres of spoil from an earlier strip mining period which have a good growth of aspen and pine trees. No additional reclamation is recommended for these areas.

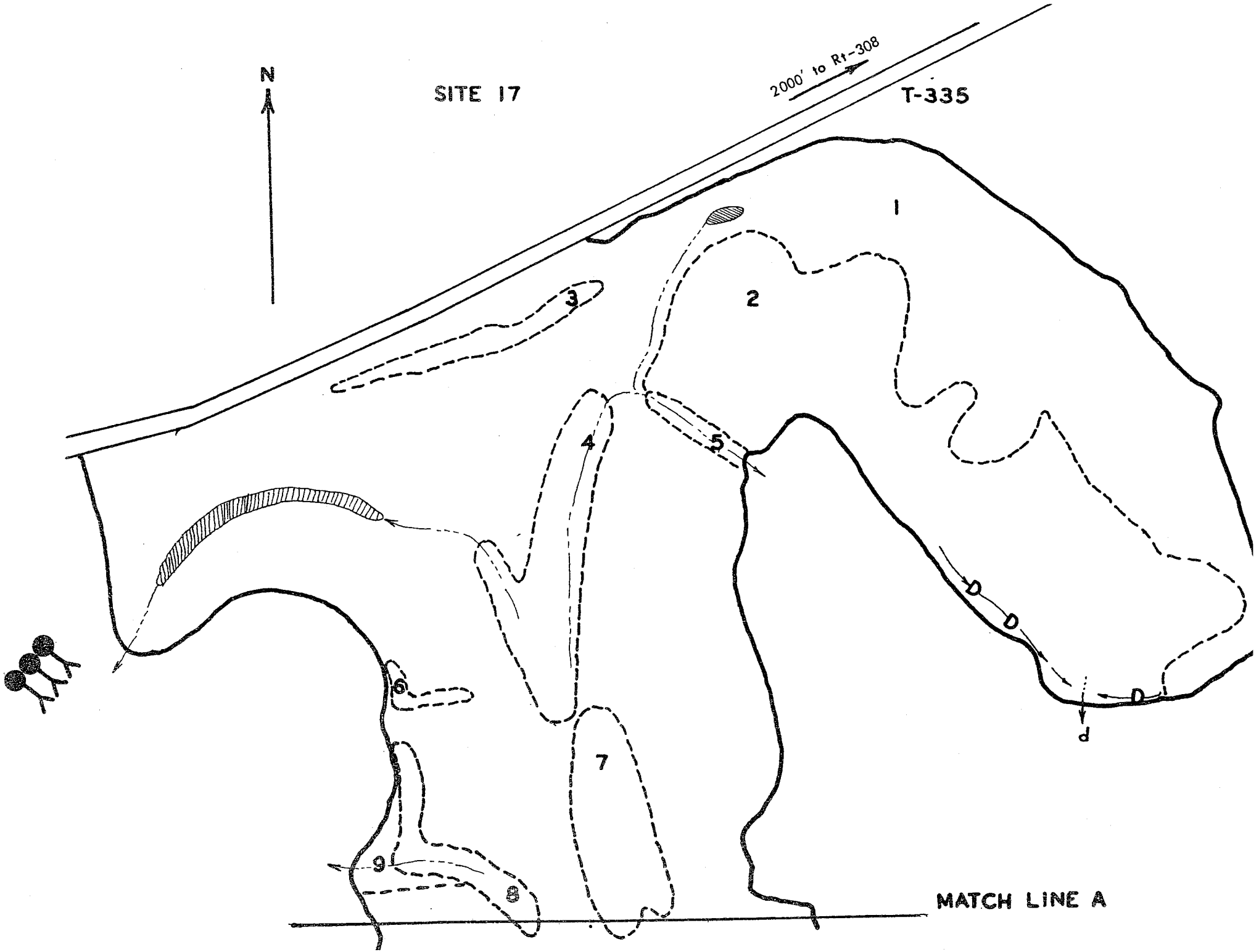
Estimated Cost of Reclamation:

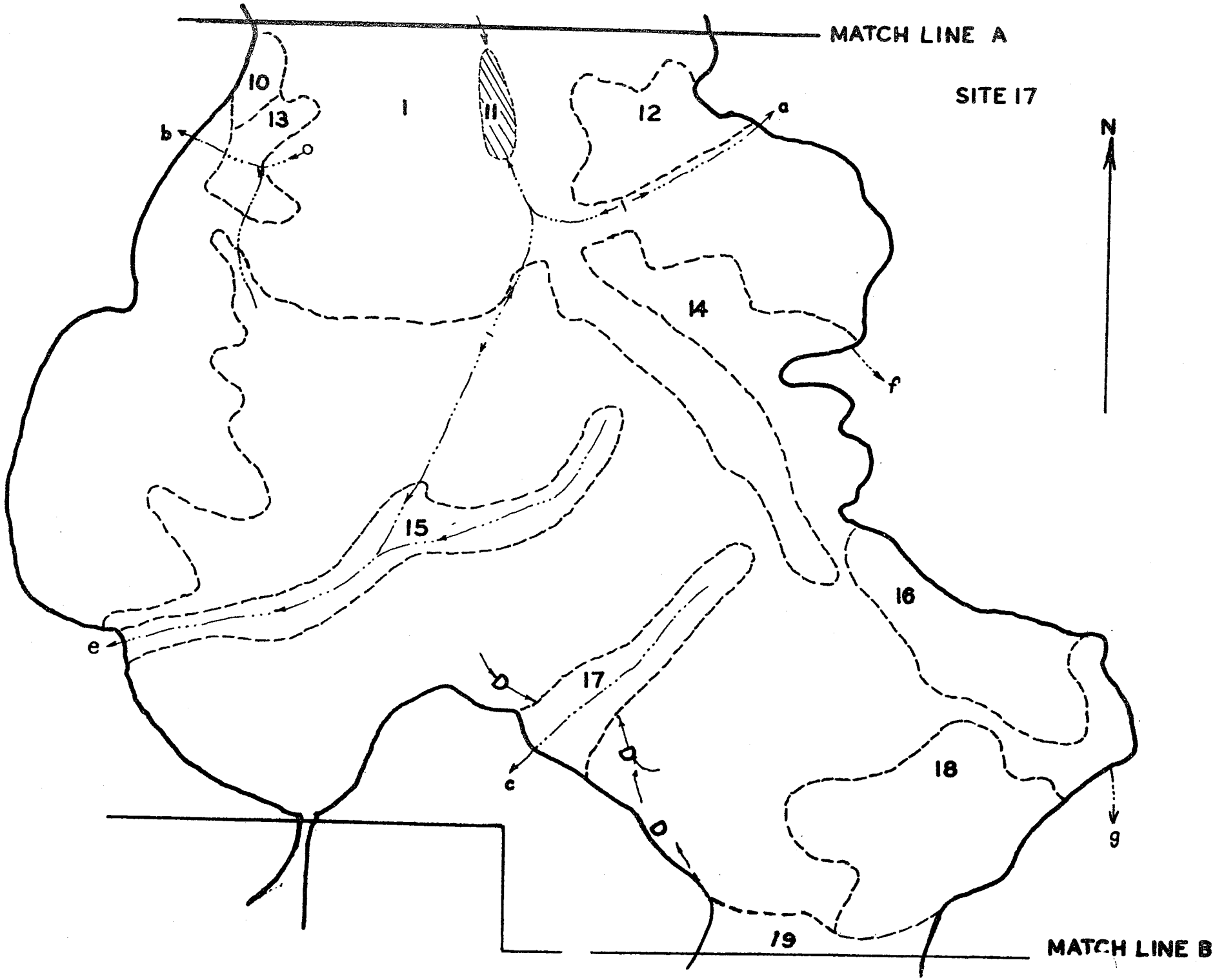
Area #1	
Grout seal on seepage area along Rt. 308	$ 20,000
Areas #2, #12 and #13	
31.1 acres of selected grading	18,600
31.1 acres of revegetation Method No. 1	9,300
Areas #3, #14 and #21	
81.7 acres of revegetation Method No. 1	24,500
Areas #4, #5, #6, #7, #8, #9, #10, #11, #15, #17 and #22	
24.1 acres of selected grading	19,000
24.1 acres of revegetation Method No. 1	7,200
Areas #16 and #18	
7 acres of revegetation Method No. 1	2,100
TOTAL	$100,700

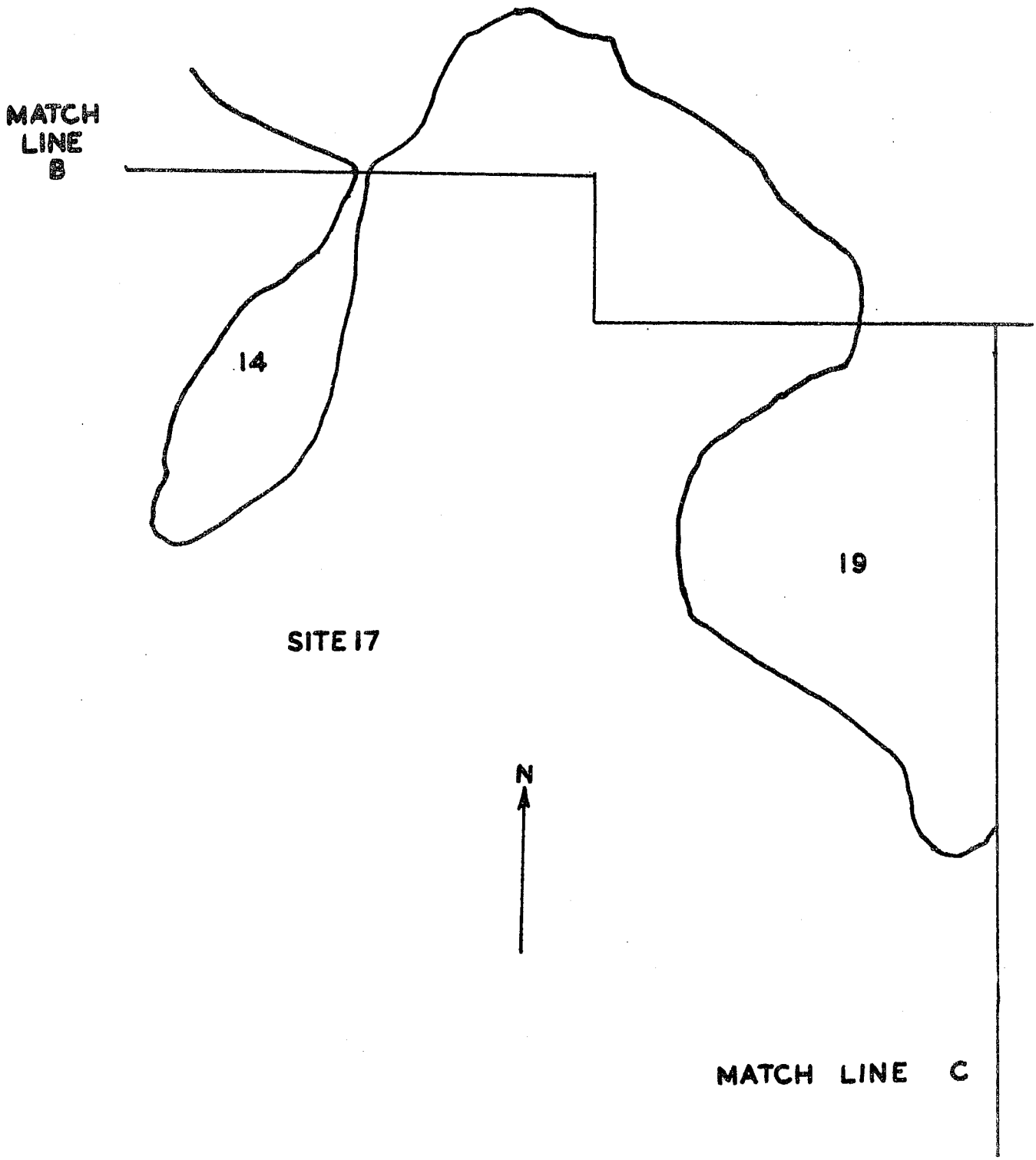
Figure 47. This large seepage area at the southeast edge of Area 18 is just one of many found around the edge of Mine 17. This mine is the largest single source of acid mine drainage in the Big Scrubgrass Creek Watershed.

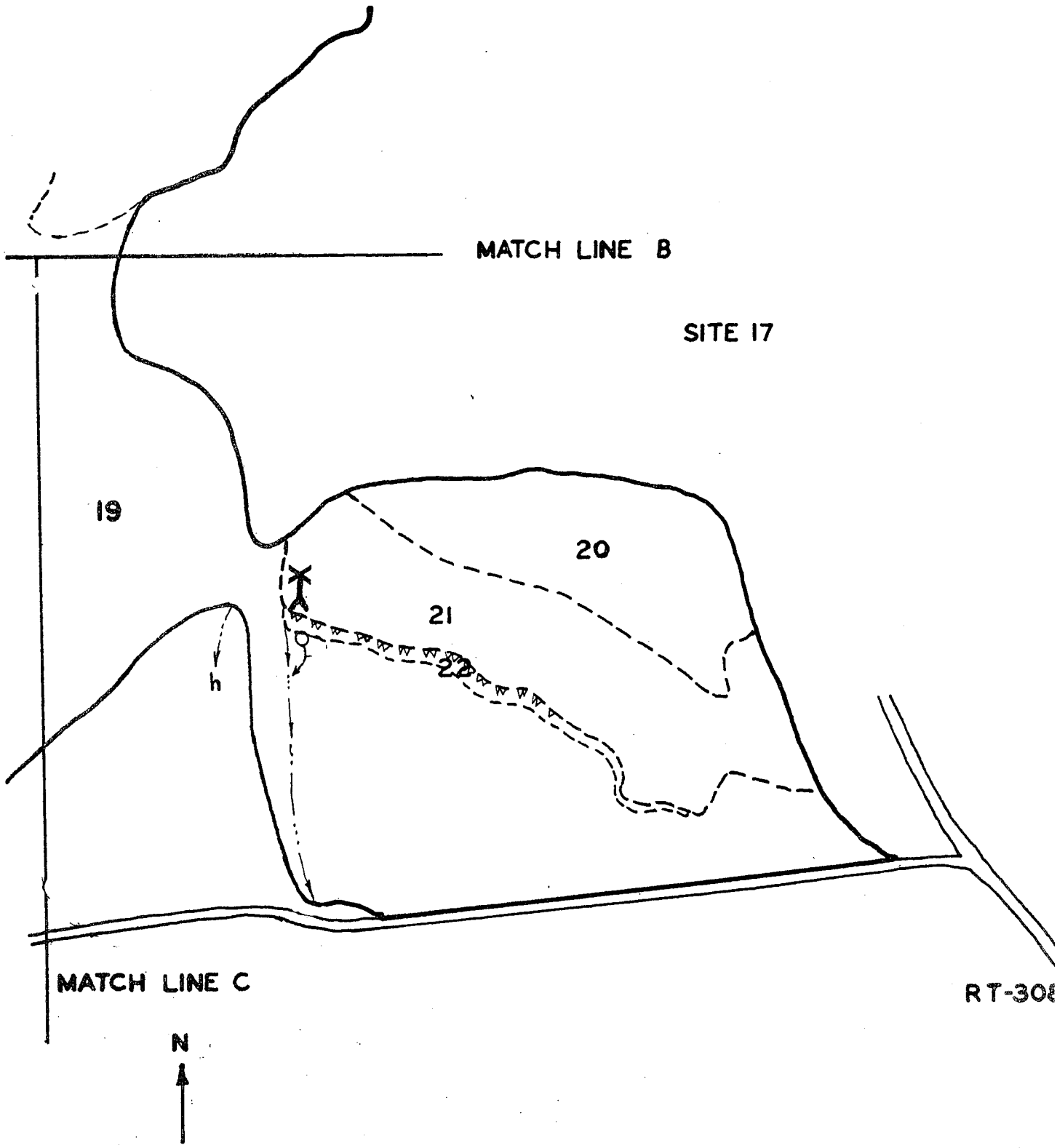
KEY FOR SITE 17




N
SITE 17
2000' to Rt-308
T-335
1
2
3
4
5
6
7
8
9
D
D
D
d
MATCH LINE A


MATCH LINE A
SITE 17
N
10
13
1
11
12
a
b
c
14
f
15
16
e
d
17
c
d
18
g
d
19
MATCH LINE B


MATCH LINE B
14
19
SITE 17
N
MATCH LINE C


MATCH LINE B
SITE 17
19
20
21
22
h
MATCH LINE C
RT-30
N

SITE 26

This site includes 45.8 acres of strip mine along the western side of the Gilmore Run valley. The area has been partially regraded and reseeded and that part which was successfully reseeded is not a source of acid. However, the remainder of this mine produces more than 300 pounds of acid per day which flows into Gilmore Run.

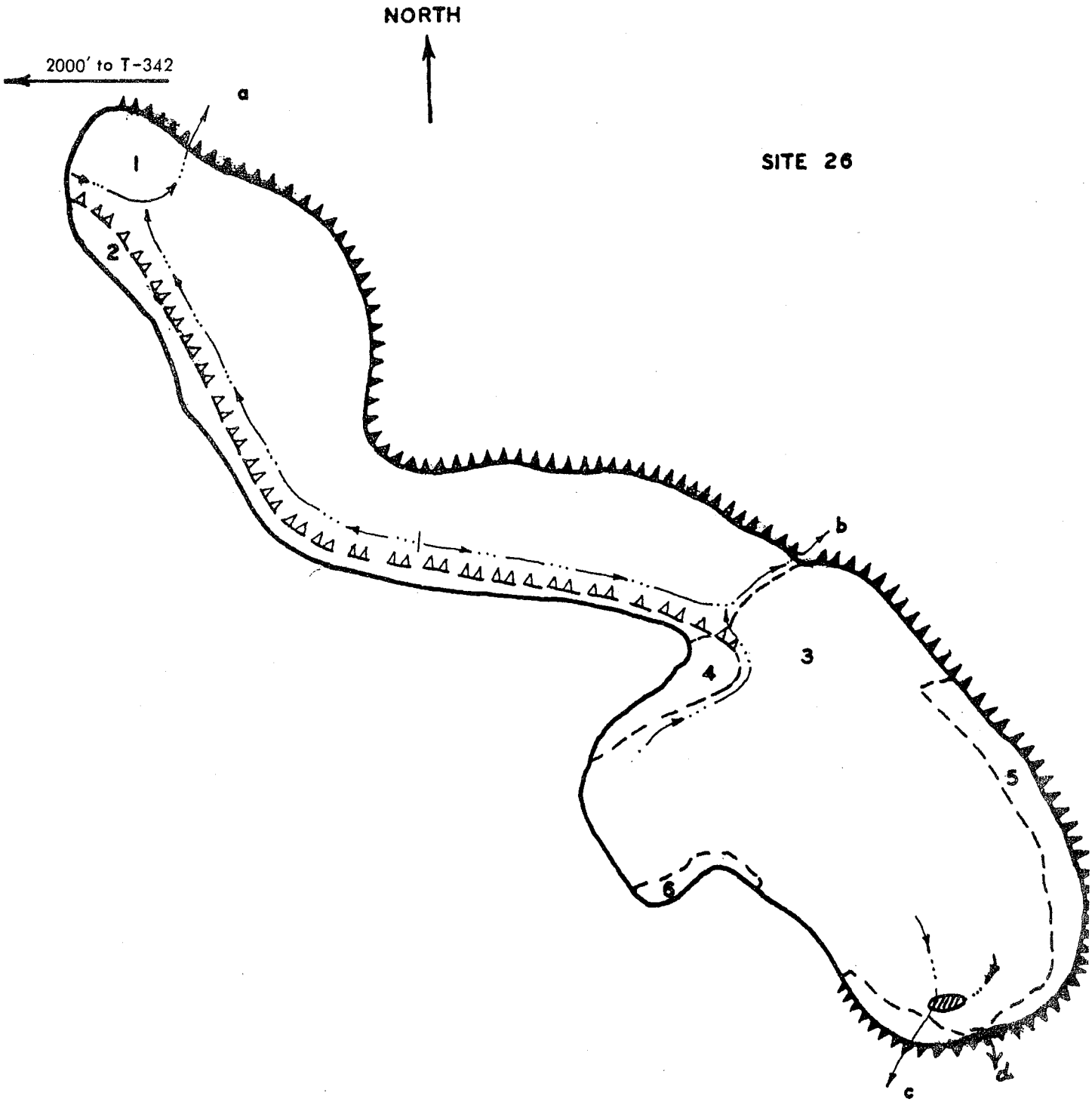
Area #1 covers 19.6 acres of partially regraded spoil material that drains back toward the highwall and then along the final cut to outlet through a ravine at point "a". The surface is almost completely bare and the outer slopes are steep and severely eroded. To eliminate the acid formation the spoil pile should be regraded to a terrace backfill and the area should be reseeded using revegetation Method No. 1.

Areas #2 and #4 cover 3.2 acres above the highwall. The soils on this area are acid and gullied from erosion which produces acid runoff during storms. A diversion should be constructed to keep runoff water out of the mined area and a lined drainage channel should be constructed to carry water from the diversion across the mine at point "b". The area should then be reseeded using revegetation Method No. 1.

Areas #3, #5 and #6 cover 23 acres which have been adequately regraded and seeded for acid control and no additional reclamation is recommended.

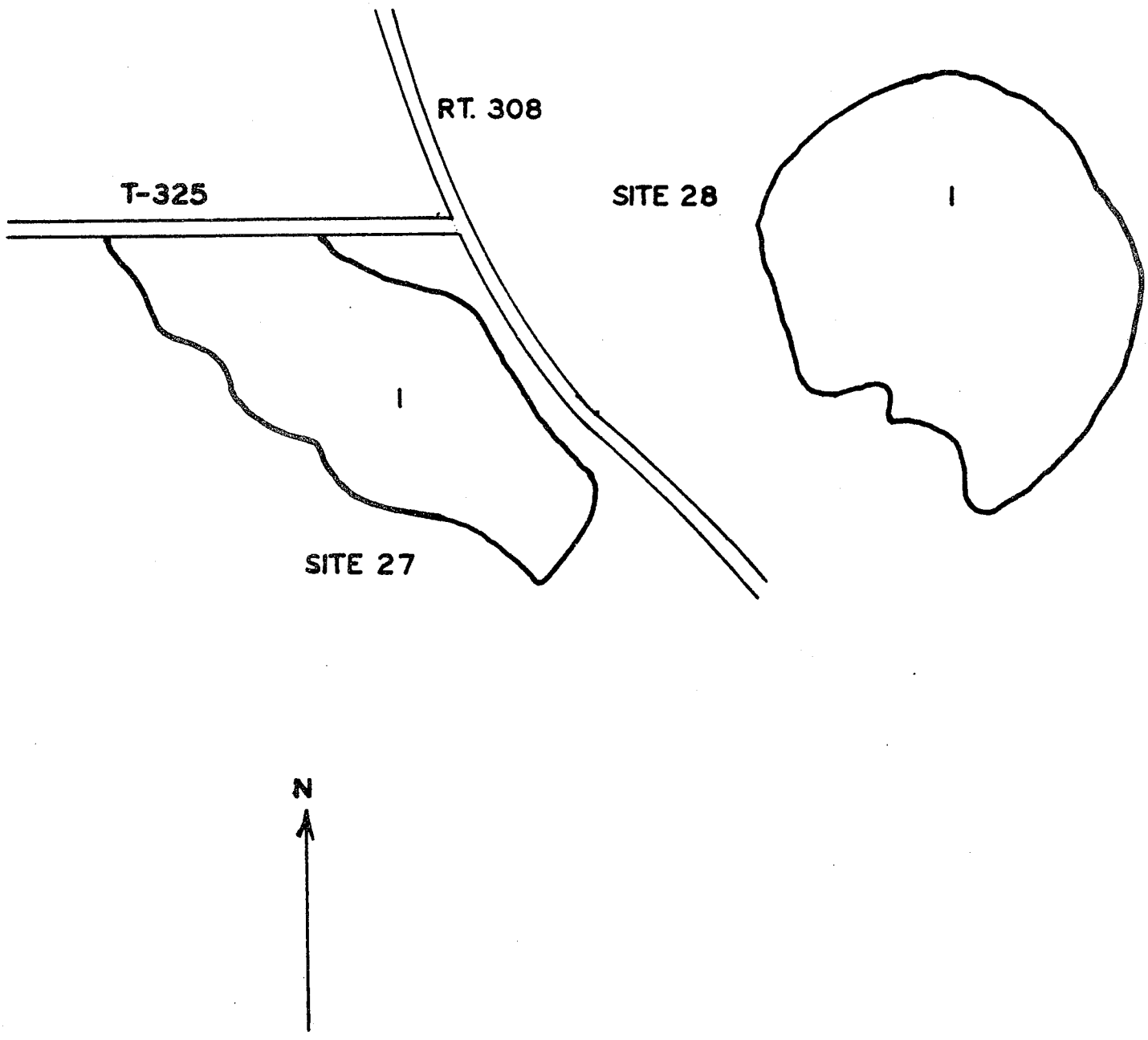
Estimated Cost of Reclamation:

Area #1	
19.6 acres of terrace backfilling	$20,000
19.6 acres of revegetation Method No. 1	5,800
Areas #2 and #4	
2500 feet of diversion channel	2,500
3.2 acres of revegetation Method No. 1	1,000
TOTAL	$29,300


NORTH
2000' to T-342
SITE 26
a
b
c
1
2
3
4
5
6

SITES 27 and 28

Mines #27 and #28 cover 12.1 and 16.9 acres respectively. These areas are both well covered with pine trees which provide adequate acid mine drainage control and no seepage was found. Therefore, no recommendations are made.


RT. 308
T-325
SITE 28
1
1
SITE 27
N

SITE 33

This site is a strip mine covering 155.7 acres on the southern divide between the Gilmore Run Subwatershed and the upper reaches of Big Scrubgrass Creek. This mine has been mostly regraded and has an excellent cover of sod and trees. Small patches of bare area exist which are producing some acid discharge.

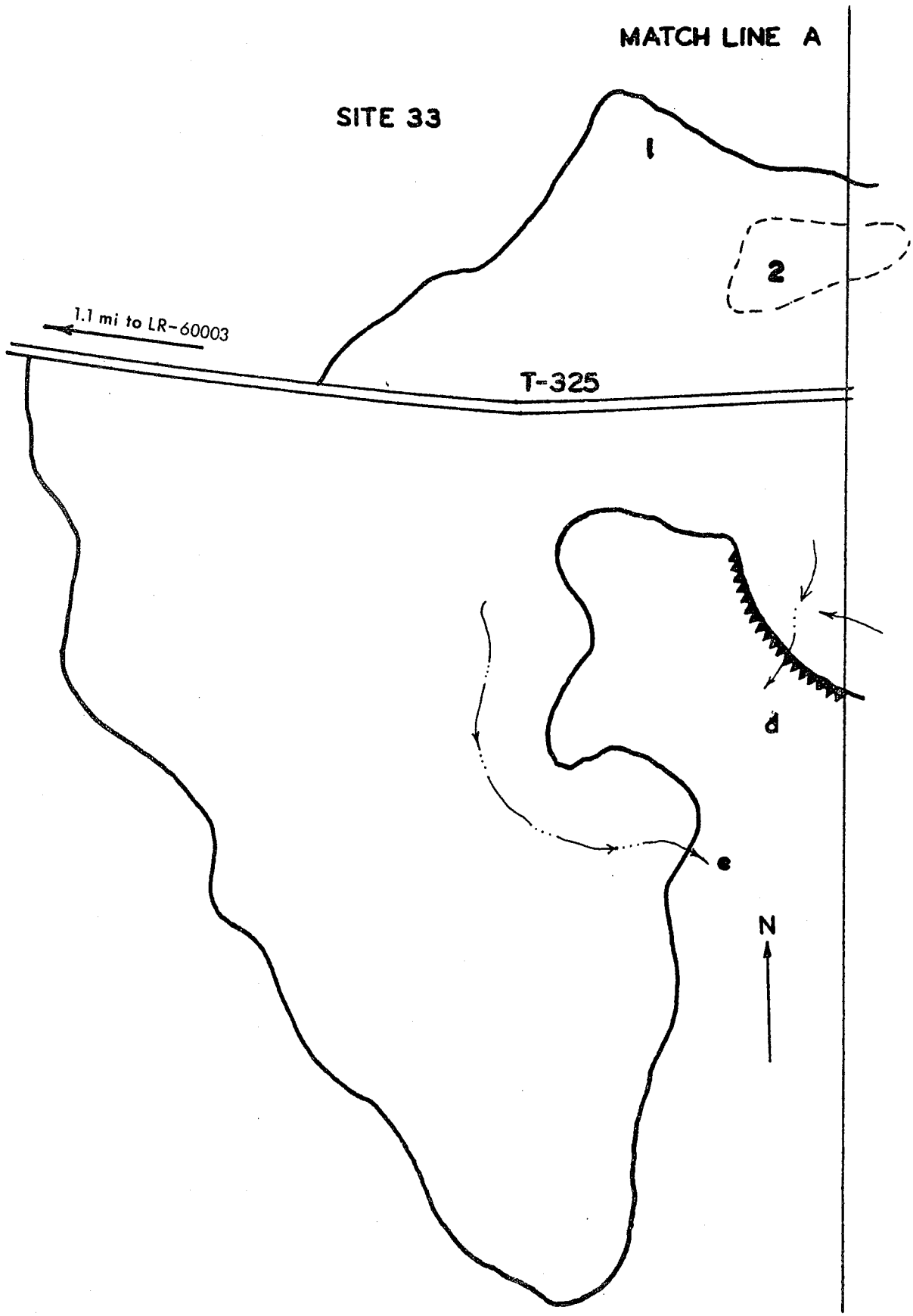
Areas #1 and #3 cover 152.1 acres of well graded and sodded spoil which need no further work.

Areas #2 and #4 cover 3.2 acres of bare acid spoil material which produce some acid runoff. Selected grading is needed to fill in some gullies which have formed and which are causing accelerated exposure of new acid forming material. These areas should then be reseeded using revegetation Method No. 1.

Area #5 covers 0.4 acres of steep outer slope which is eroding and producing acid runoff. This small area should be stabilized using revegetation Method No. 3.

Estimated Cost of Reclamation:

Areas #2 and #4	
3.2 acres of selected grading	$ 1,500
3.2 acres of revegetation Method No. 1	1,000
Area #5	
0.4 acres of revegetation Method No. 3	100
TOTAL	$ 2,600


MATCH LINE A
SITE 33
1
2
1.1 mi to LR-60003
T-325
d
e
N

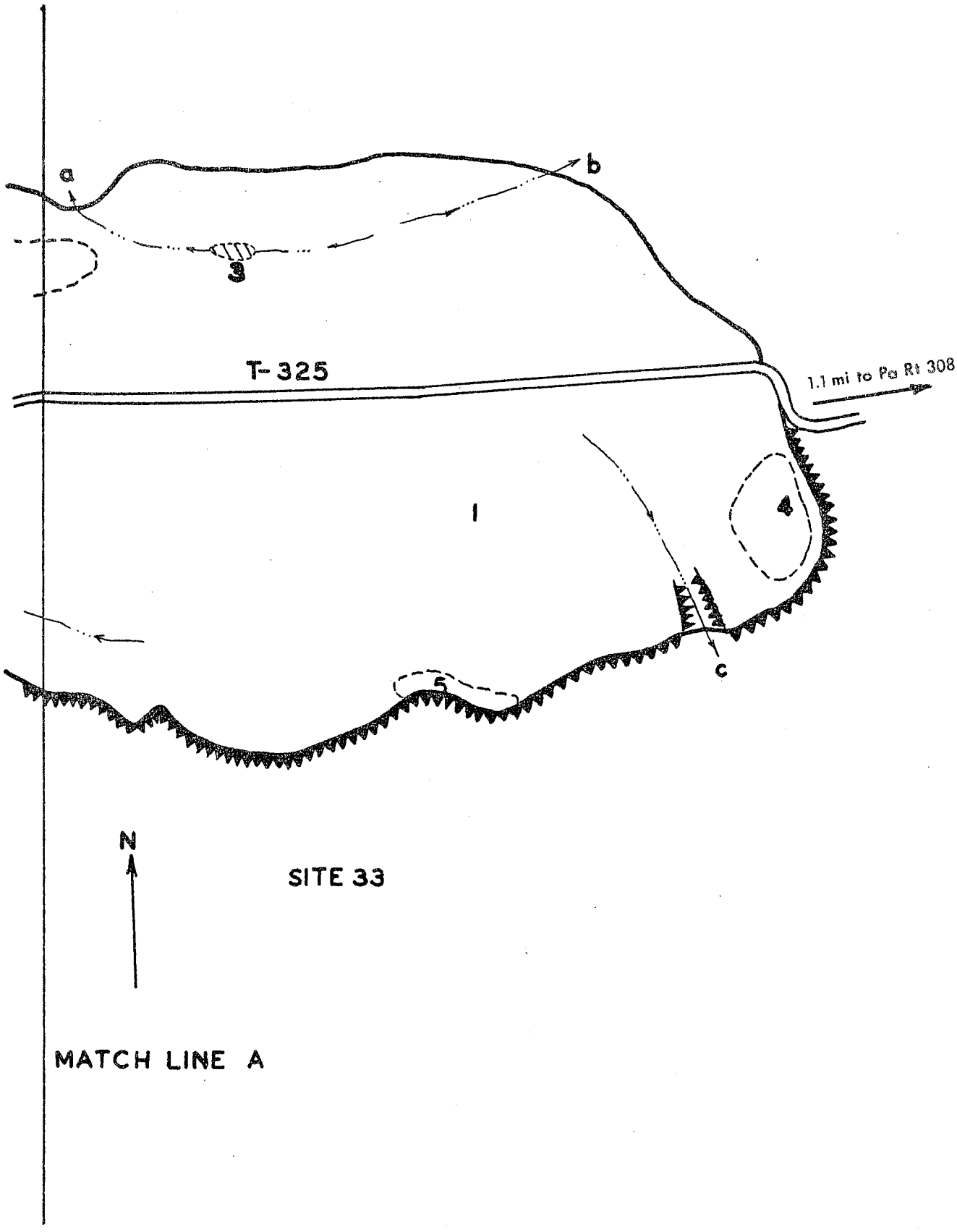

a
b
3
T-325
1.1 mi to Pa Rt 308
1
4
5
c
N
SITE 33
MATCH LINE A

TABLE 12. SUMMARY OF ABATEMENT PLANS AND COSTS FOR THE GILMORE RUN SUBWATERSHED

Mine Site No.	ABATEMENT METHOD																	
	CLEARING		TERRACE BACKFILL		CONTOUR BACKFILL		SELECTED GRADING		SURFACE SEALING	DEEP MINE SEALING	SOIL REVEGETATION		DIVERSION		LINED CHANNELS		TOTAL COST
	Acres	Cost	Acres	Cost	Acres	Cost	Acres	Cost	Cost	Cost	Acres	Cost	Feet	Cost	Feet	Cost	
13			57.1	57100							67.8	19600	5000	5000			$ 81,700
14																	*
15			12.9	12900			12.8	7600		20000	40.8	22800			400	2000	$ 65,300
16							5.0	3000			7.8	2300	1500	1500			$ 6,800
17							55.2	37600		20000	143.9	43100					$100,700
26			19.6	20000							22.8	6800	2500	2500			$ 29,300
27																	*
28																	*
33																	*

TOTAL $283,800

*Where no costs are shown, no work has been recommended