

MAJOR SOURCE 4808 NORTH BRANCH ROBINSONS RUN

A. Description of the Source Area

1. Major source 4808 is located in North Fayette Township, Allegheny County, Pennsylvania, approximately two miles southeast of Santiago. The source discharges its polluted waters into Half Crown Run. The location of the source is shown on the enclosed Dwg. 4808-A and on the OAKDALE 7-1/2 minute quadrangle included in Appendix All.
2. The discharges emerge from the base of a strip highwall (OAK 50) and two small strip ponds. The effluent flows in a ditch to a swampy area near the road where it picks up a small additional discharge from the same strip and then is piped under the road into Half Crown Run. The area has also been deep mined and is part of the Pittsburgh Coal Company's Partridge Mine.
3. Thirteen months of study show the following maximum, minimum and average weighted parameters for source 4808:

	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	3.8	1.7	2.8
Flow (gpm)	175	10	28
Acidity (mg/l)	790	340	528
Iron (mg/l)	27.5	6.25	13.7
Manganese (mg/l)	7.5	4.9	5.8
Sulfate (mg/l)	2250	1300	1704
Hardness (mg/l)	2410	710	1190
Acid Load (lbs/day)	1197	46	187
Temperature (degrees C)	23.5	5.0	15.3

4. Calculations show that source 4808 contributes approximately .5% of the total daily average acid load into Chartiers Creek. Analysis of the data indicates that source 4808 is a potential slugger. The slugging index is 6X.

B. Drainage

1. Surface Drainage: Source 4808 drains into Half Crown Run which flows south and discharges into North Branch Robinsons Run. The water of Half Crown Run is polluted by source 4810 prior to receiving the discharge from source 4808.
2. Subsurface Drainage: The predominant trend of the subsurface drainage is to the southeast. Structure contours constructed on the base of the coal and the plotting of the location of major mine haulageways indicate that source 4808 may be located on a main haulageway. See Dwg. 4808 - B. Dwg. 4808 - B also shows the relationship between source 4808 and sources 4834, 4807, and 4833. Corrective work north and west of source 4808 may greatly reduce the slugging capacity of source 4808.

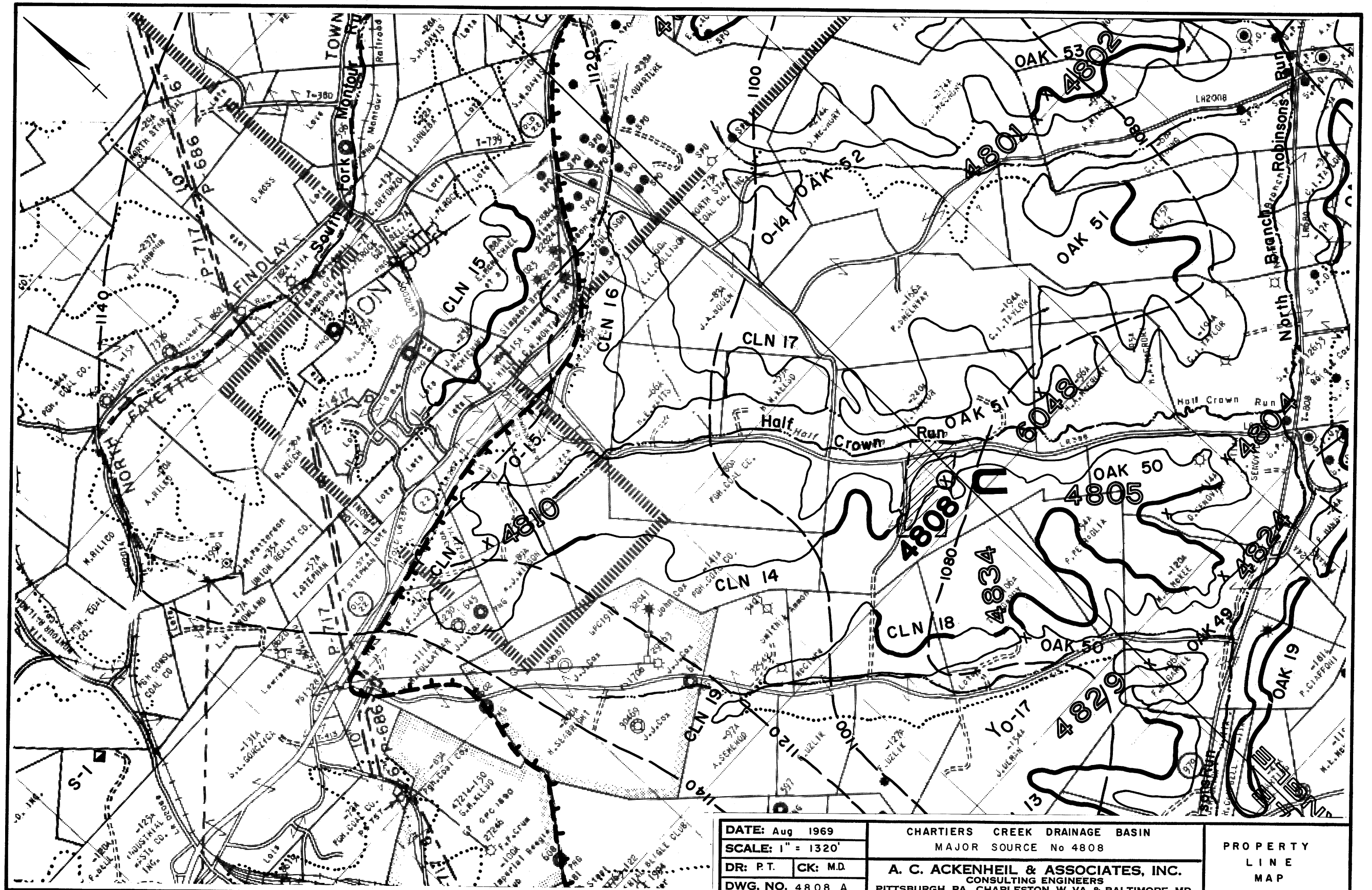
C. Field Investigations and Abatement Methods

1. Field investigations performed in the vicinity of source 4808 indicate that the coal is exposed in the highwall of strip mine OAK 50 at the source location.
2. During the thirteen months of field study, it was noted that smoke was emitting in the vicinity of source 4808 and also in the vicinity of source 4804. Closer observations revealed that smoke was emitting along the outcrop from a deep mine. The two smoke emissions are part of the same deep mine and the same strip mine (OAK 50) and are approximately 3,000 ft. apart.
3. In July, 1969, representatives from the Department of Mines and Mineral Industries, Bureau of Mines, and the Appalachian Regional Commission visited the site and agreed that action to extinguish the fires would be taken within a year.

D. Cost of Methods of Abatement

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
Area A and Area B in Source 4134 should have a great influence on source 4808 (See Dwg. 4808 - B)		
In Area C, improve drainage through strip mine OAK 50 north of source 4808 (located on the 240-acre property owned by C. I. Taylor)	\$20,500	30%

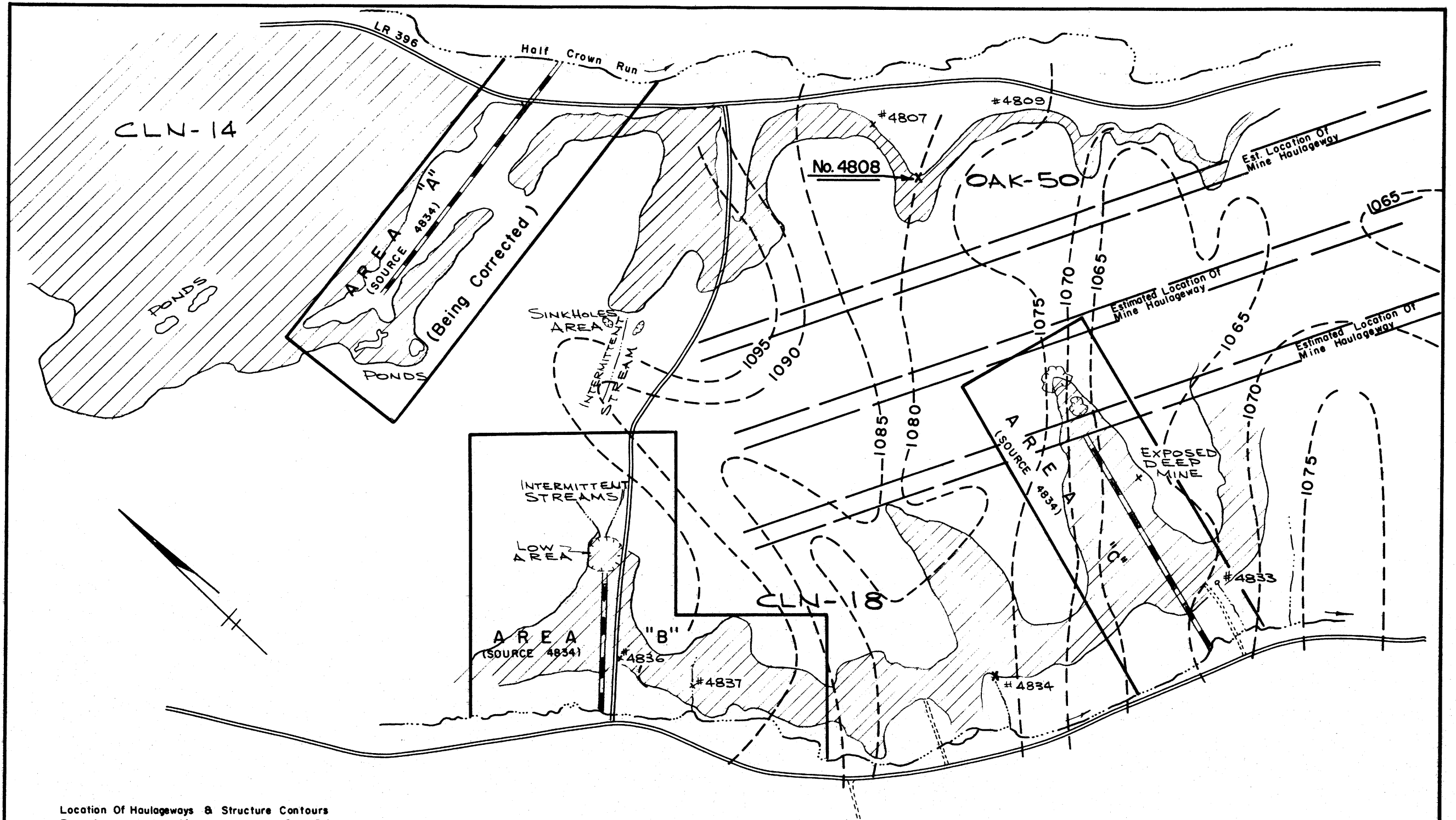
Corrective measures for the deep mine fire which is occurring in the deep mine next to OAK 50 will result in reclamation of a portion of OAK 50. It is recommended that prior to performance of any work north of source 4808, the limits of the mine fire project be established.



DATE: Aug 1969
 SCALE: 1" = 1320'
 DR: P.T. CK: M.D.
 DWG. NO. 4808 A

CHARTIERS CREEK DRAINAGE BASIN
 MAJOR SOURCE No 4808
A. C. ACKENHEIL & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 PITTSBURGH, PA., CHARLESTON, W. VA. & BALTIMORE, MD.

PROPERTY
 LINE
 MAP



Location Of Haulageways & Structure Contours
 From Interpolation Of Deep Mine Map & W.P.A.
 Coal Map, Burgettstown No.9

DATE: June 1969		CHARTIERS CREEK DRAINAGE BASIN		STRIP & DEEP MINE LOCATION MAP
SCALE: 1" = 500'		MAJOR SOURCE No. 4808		
DR: PT	CK: L. H.	A. C. ACKENHEIL & ASSOCIATES, INC.		
DWG. NO. 4808 - B		CONSULTING ENGINEERS PITTSBURGH, PA., CHARLESTON, W. VA. & BALTIMORE, MD.		

MAJOR SOURCE 6048 NORTH BRANCH ROBINSONS RUN

A. Description of the Source Area

- I. Source 6048 is located in North Fayette Township, Allegheny County, Pennsylvania, and is approximately 1.5 miles southeast of Santiago - (Tyre P.O.), Pennsylvania. The location of the source is shown on the enclosed Dwg. 6048 - A and on the OAKDALE 7-1/2 minute quadrangle which is included in Appendix AII.
2. The discharge emerges from an 18-in. diameter concrete pipe draining an unreclaimed strip mine area (OAK 51). WPA coal maps do not indicate any deep mine openings in the area; therefore, the discharge is probably due to the stripping operations breaking into the deep mine. Field investigations revealed other places in the same strip mine where stripping operations have broken into the deep mine.
3. Thirteen months of field and laboratory study indicate the following maximum, minimum and weighted average parameters for source 6048:

	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	4.3	1.5	3.1
Flow (gpm)	480	120	234
Acidity (mg/l)	584	286	442
Iron (mg/l)	12.5	2.5	5.7
Manganese (mg/l)	8.5	3.4	6.1
Sulfate (mg/l)	2250	1125	1601
Hardness (mg/l)	1380	640	1034
Acid Load (lbs/day)	2765	515	1260
Temperature (degrees C)	18	9	12.8

Source 6048 supplies approximately 3.5% of the total average acid load contributed per day by the major sources into Chartiers Creek, based on thirteen months of readings.

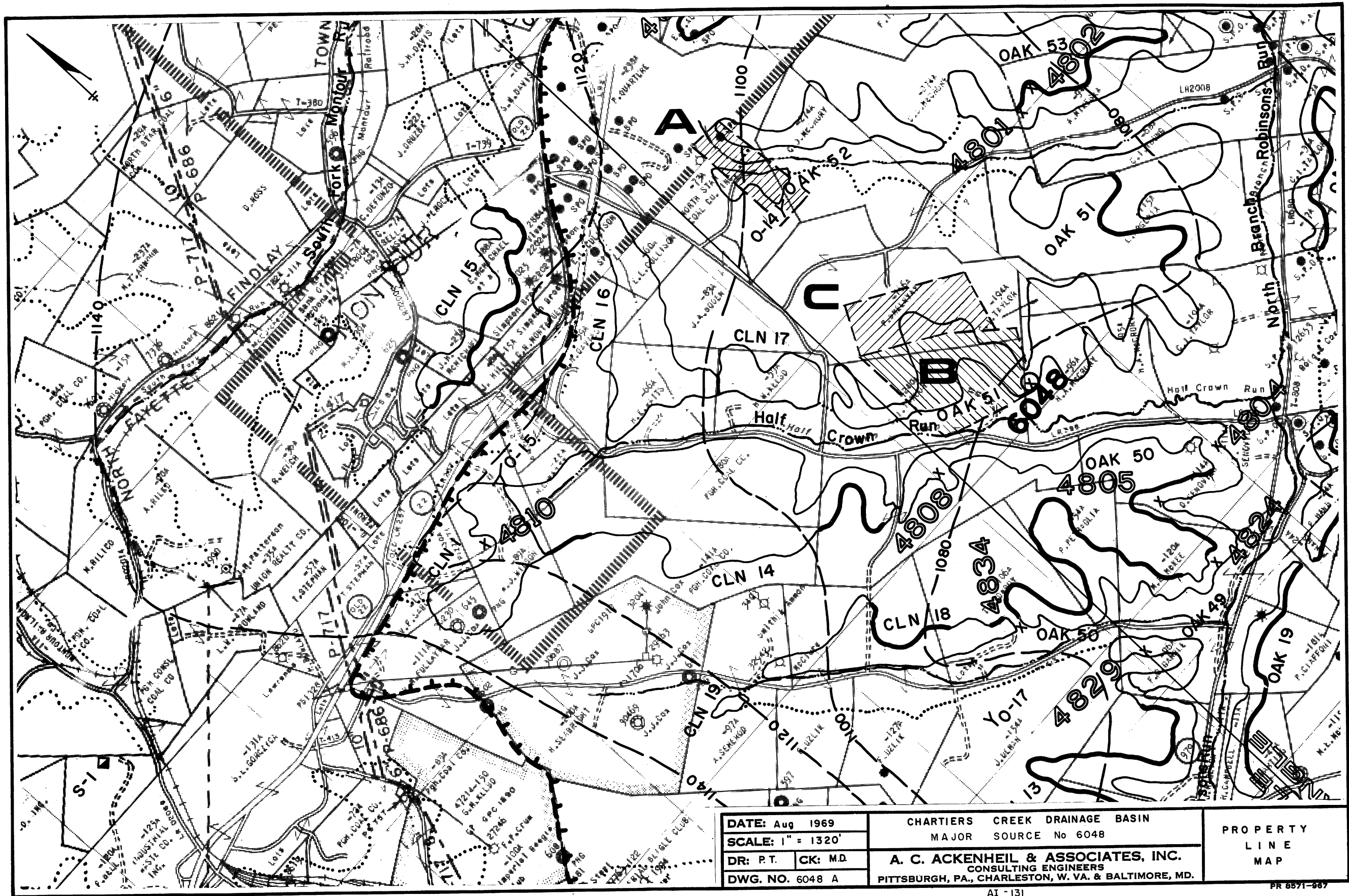
B. Drainage

- I. Surface Drainage: Source 6048 discharges into Half Crown Run. Additional drainage of the area was provided by a small tributary to Half Crown Run which flowed approximately 200 ft. northwest of the source. At the present time, no flow has been observed in the tributary except for some small stagnant ponds at the base of the strip spoil pile.

4. To completely abate acid mine drainage emitting from source 6048, we recommend limestone neutralization. The laboratory analysis indicates that the acid mine water discharging from source 6048 has low iron concentrations. A rotating drum filled with limestone should eliminate the acid concentrations from the discharge. Aeration of the waters can be obtained by improving the natural, steplike topography over which the discharge flows. The cost estimate for the design, construction and operation of the limestone neutralization facility will be presented upon the acceptance of this recommended method of abatement by the Department of Mines and Mineral industries.

D. Cost of Methods of Abatement

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
<u>Area A: North Star Coal Co., Jean Mine</u>	\$8,500	13
1. Provide a drainage ditch from the Jean Mine entries to the stream		
2. Seal the openings of Jean Mine and the country pit opening in the stream channel (O-14)		
Sub-Total :	\$8,500	13%
<u>Area B: C.I. Taylor Property (Strip Mine OAK 51)</u>	\$15,000	5
1. Eliminate the strip ponds feeding the deep mine		
2. Provide a drainage ditch through the strip mine to source 6048		
Sub-Total :	\$23,500	18%

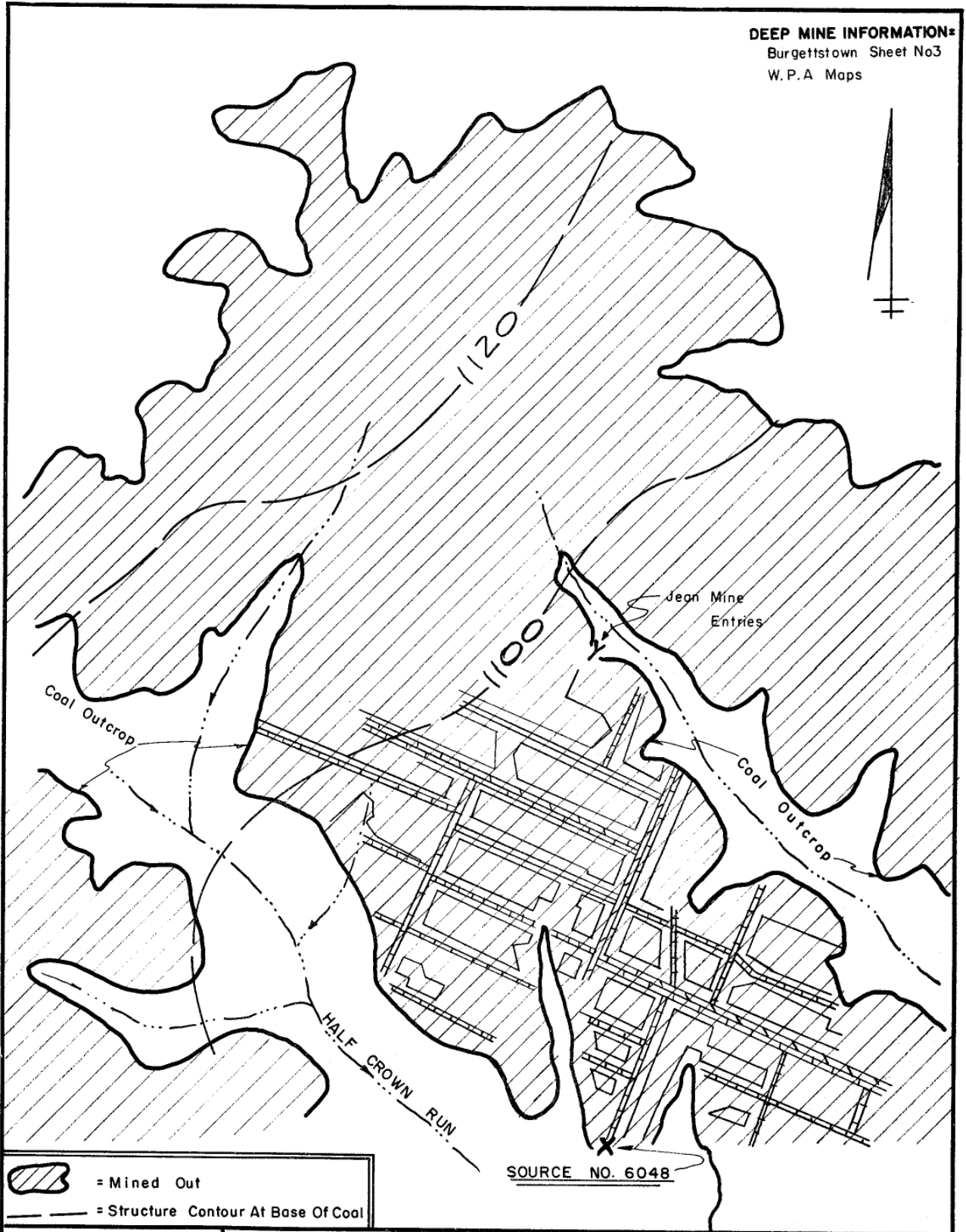



DATE: Aug 1969
 SCALE: 1" = 1320'
 DR: P.T. CK: M.D.
 DWG. NO. 6048 A

CHARTERS CREEK DRAINAGE BASIN
 MAJOR SOURCE No 6048
A. C. ACKENHEIL & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 PITTSBURGH, PA., CHARLESTON, W. VA. & BALTIMORE, MD.

PROPERTY
 LINE
 MAP

DEEP MINE INFORMATION
 Burgettstown Sheet No3
 W.P.A. Maps



 = Mined Out
 - - - = Structure Contour At Base Of Coal

DATE: June 1969
SCALE: 1" = 1200'
DR: PT **CK:** I.H.
DWG. NO. 6048-B

CHARTIERS CREEK DRAINAGE BASIN
 MAJOR SOURCE No. 6048
A. C. ACKENHEIL & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 PITTSBURGH, PA. & CHARLESTON, W. VA.

DEEP
 MINE
 MAP

MAJOR SOURCES 4802 - 4801 NORTH BRANCH ROBINSONS RUN

A. Description of the Source Area

- I. Sources 4802 and 4801 are located in North Fayette Township, Allegheny County, Pennsylvania, approximately two miles southeast of the Borough of Santiago. The locations of the sources are shown on the enclosed Dwg. 4802-01 - A and on the OAKDALE 7-1/2 minute quadrangle included in Appendix All.
2. The area has been deep and strip mined with the stripping exposing the deep mine. The deep mine is a portion of the Pittsburgh Coal Company's Montour No. 9. The deep mining was terminated in 1946 and the strip mining in 1947. The main discharge, 4802, emerges from a drift opening, and source 4801 discharges through a drainage pipe from the deep mine. The sources merge and flow into an unnamed southeast-flowing tributary of North Branch Robinsons Run. Based on thirteen months of readings, source 4802 supplies approximately 1.5% of the total average acid load contributed per day into Chartiers Creek by the major sources and source 4801 supplies approximately 1.0%.
3. Thirteen months of field testing and laboratory analysis indicate the following maximum, minimum and weighted average parameters of sources 4802 and 4801:

Major Source 4802:	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	3.4	1.6	2.8
Flow (gpm)	600	1	70
Acidity (mg/l)	500	350	445
Iron (mg/l)	65.0	3.0	17.9
Manganese (mg/l)	4.0	1.2	3.3
Sulfate (mg/l)	2000	500	1360
Hardness (mg/l)	1410	490	970
Acid Load (lbs/day)	3888	6	430
Temperature (degrees C)	21	4	13.2

Major Source 4801:	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	3.3	1.7	2.8
Flow (gpm)	200	15	59
Acidity (mg/l)	632	352	480
Iron (mg/l)	65.0	6.25	18.7
Manganese (mg/l)	4.2	2.4	3.3
Sulfate (mg/l)	3000	1050	1620
Hardness (mg/l)	2200	670	1220
Acid Load (lbs/day)	1152	86	344
Temperature (degrees C)	20	6.5	13.6

4. Based on the field investigations, it appears that the sources are potential sluggers, as shown by the high flow and acid load in May, 1968. The slugging index of sources 4802 and 4801 is 7X, which indicates that these sources are capable of producing up to seven times the average acid load as shown on the preceding page.

B. Drainage

- I. Surface Drainage: The surface streams that drain the area in the vicinity of the sources flow in a south to southwesterly direction into North Branch Robinsons Run. The discharge emitting from the sources flows to the southeast and into North Branch Robinsons Run.
2. Subsurface Drainage: We have obtained a small portion of the mine map showing sources 4802 and 4801. Structure contours on the base of the coal indicate the lowest part of the mine is at the sources. Therefore, the subsurface drainage appears to flow from other areas of the mine toward the discharge points. The average flow for the past thirteen months has been approximately 70 gpm for source 4802 and 59 gpm for source 4801. See Dwg. 4802-01 - B.

C. Field Investigations and Abatement Methods

Field studies were conducted north, northeast and northwest of the sources to evaluate the relationship between the surface and subsurface drainage. The field investigations have shown the coal had been stripped in these areas. There are many areas which are unreclaimed; therefore, surface runoff could accumulate in the strip pits and eventually seep into the deep mine. The results of the field investigations are as follows:

- I. Area A: Numerous sink holes were located in a valley approximately 3,800 ft. northwest of the sources on the 274-acre parcel belonging to C. D. McCrory and the 73-acre parcel belonging to the North Star Coal Company. The explorations of this valley indicated no flowing streams. The abandoned stream channels were overgrown in the valley bottom; therefore, it was concluded that the streams were lost due to mine subsidence soon after deep mining was completed. The drainage area of this valley is approximately 20 acres and contributes about 12 gpm to the deep mine through the percolation of surface waters. Filling the sink holes and providing drainage across the sink area should reduce access of water into the mine.
2. Area B: Approximately 1,200 ft. northeast of the sources is a randomly reclaimed strip mine, OAK 53. The strip mine spans the properties of C. D. McCrory (274 acres), F. T. Hamm (69 acres), A. Mikeska (94 acres), the West Allegheny Rod and Gun Club (127 acres), A. W. Didion (25 acres), C. Malinowski (6 acres), J. Shagas (100 acres), and E. Baldigowski (51 acres). During periods of heavy rainfall the surface runoff appears to collect in the strip pits and eventually a portion of this water enters into the deep mine through mine openings exposed in the strip mine highwall. Backfilling the area where strip mining has exposed the deep mine would prevent an estimated 75% of the water from entering the

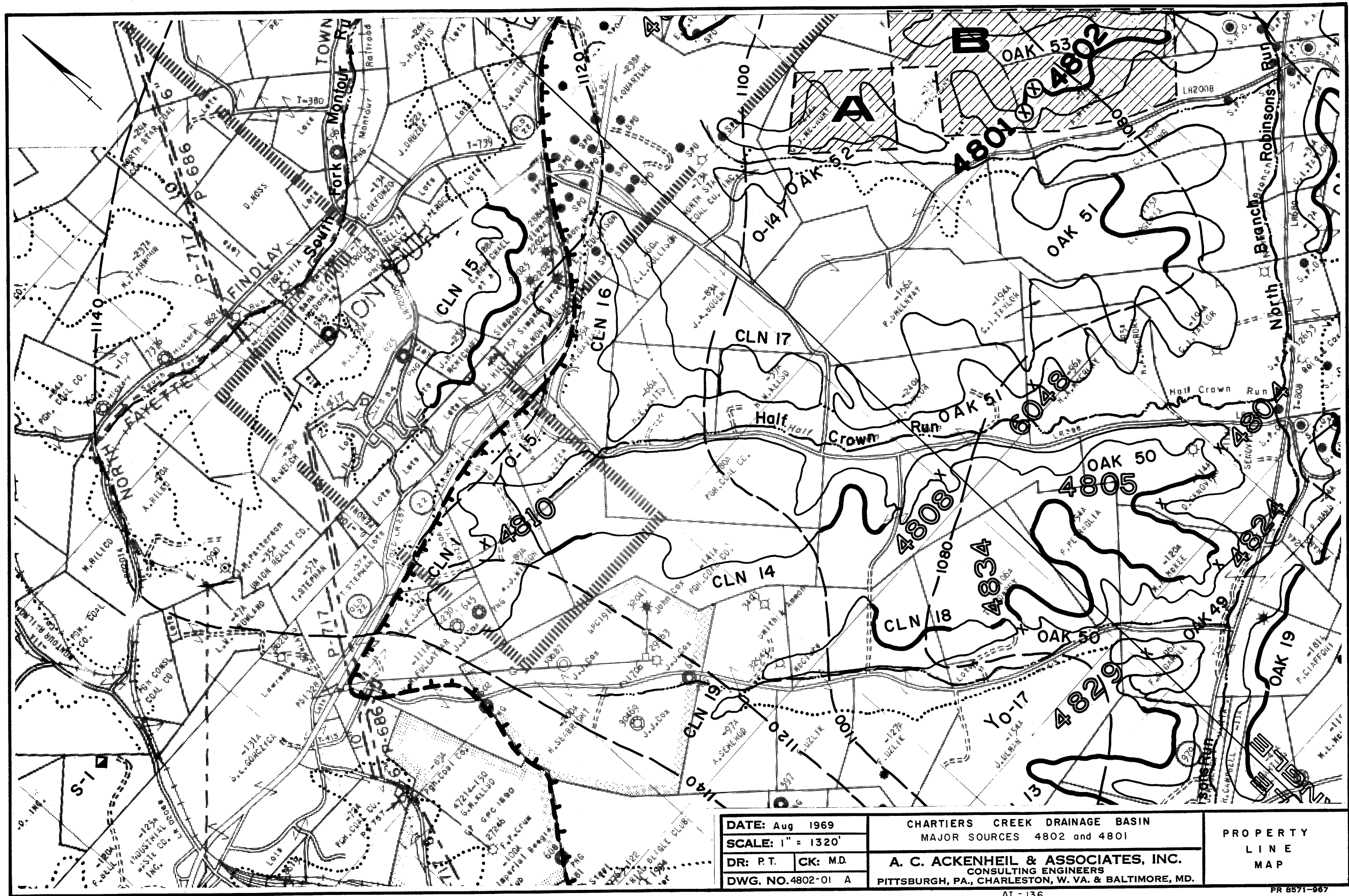
deep mine. Ponds and deep mine discharges which are approximately at the level of the coal seam have formed a stream within the strip and are located to the northeast of a relatively high spoil pile extending the length of the strip. In our opinion the stream is below the base of the coal and adds little or no water to the sources.

3. It is estimated that the recommended abatement methods will reduce the flow at the sources by approximately 42%.

D. Cost of Methods of Abatement

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
<u>Area A: (C. D. McCrory and North Star Coal Company Properties)</u>		
1. Fill sink holes and improve channel over sink hole area	\$8,000	9%
<hr/>		
Sub-Total:	\$8,000	9%
<u>Area B: (C. D. McCrory, F. T. Hamm, A. Mikeska, West Allegheny Rod & Gun Club, A. W. Didion, C. Malinowski, J. Shagas, E. Baldigowski Properties)</u>		
1. Improve drainage through strip mine OAK 53 and cover exposed entries into deep mines	\$99,000	33%
<hr/>		
TOTAL:	\$107,000	42%

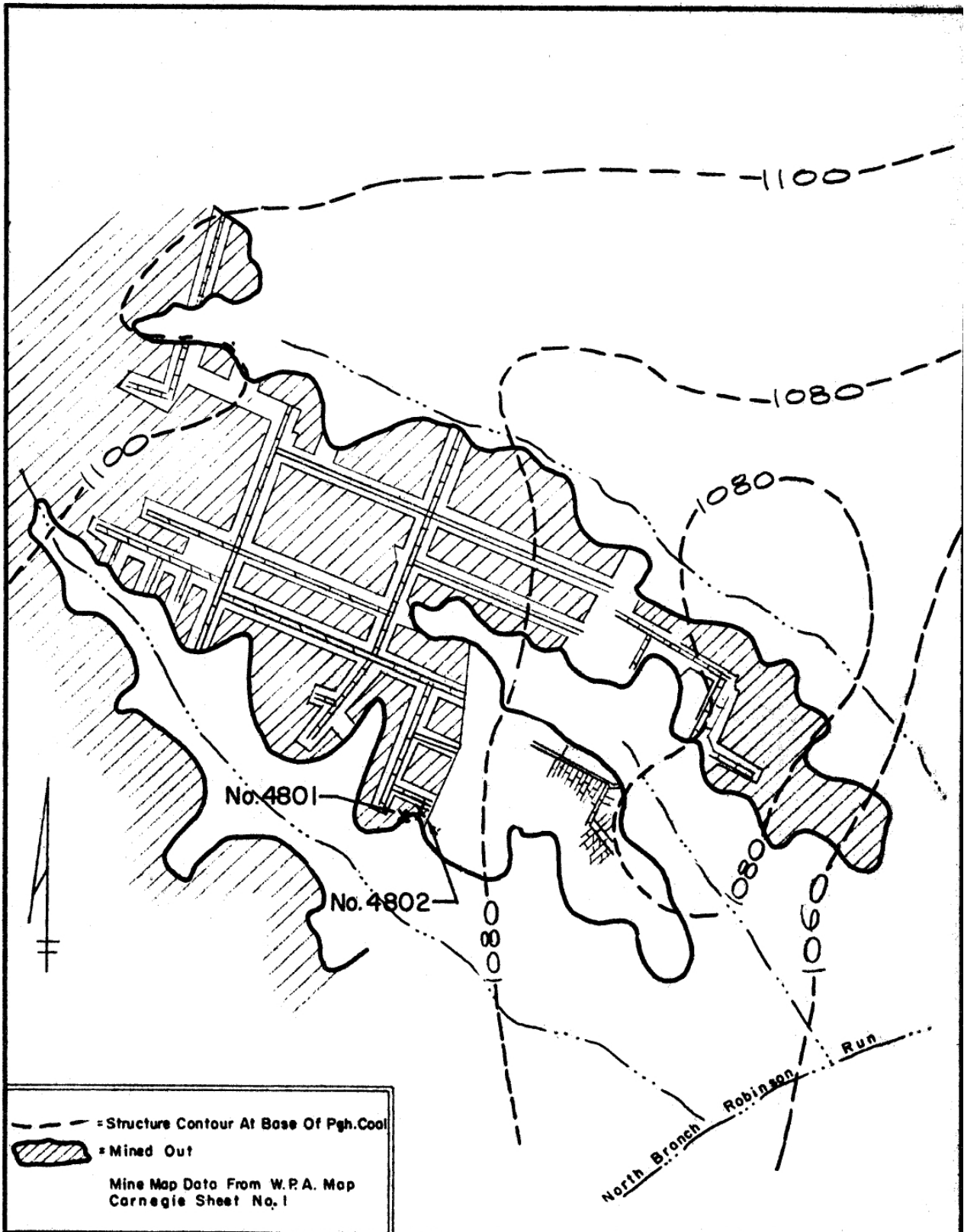
An additional abatement measure such as the use of a box cut between strip mines OAK 53 West and OAK 53 East should be considered. Costs for this work have not been estimated but should be included during the design of abatement methods. The general location of the proposed box cut is shown on Dwg. 4802-01 - A.



DATE: Aug 1969
 SCALE: 1" = 1320'
 DR: P.T. CK: M.D.
 DWG. NO. 4802-01 A

CHARTIERS CREEK DRAINAGE BASIN
 MAJOR SOURCES 4802 and 4801
A. C. ACKENHEIL & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 PITTSBURGH, PA., CHARLESTON, W. VA. & BALTIMORE, MD.

PROPERTY
 LINE
 MAP



DATE: July 1969
SCALE: 1" = 1200'
DR: PT **CK:** MTD
DWG. NO. 4802-01 - B

CHARTIERS CREEK DRAINAGE BASIN
 MAJOR SOURCES Nos. 4801 & 4802
A. C. ACKENHEIL & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 PITTSBURGH, PA. & CHARLESTON, W. VA.

DEEP
 MINE
 MAP

MAJOR SOURCE 4820 NORTH BRANCH ROBINSONS RUN

A. Description of the Source Area

- I. Major source 4820 is located in North Fayette Township, Allegheny County, Pennsylvania, and is approximately one mile south of Imperial. The location of this source is shown on the enclosed Dwg. 4820 - A and on the OAKDALE 7-1/2 minute quadrangle included in Appendix All.

2. The effluent is discharging from a deep mine opening in a highwall exposed by strip mining. (OAK 54). The deep mine is Pittsburgh Coal Company's Margerum Mine. The discharge is channeled through the valley and past the two fishing lakes into the unnamed tributary of North Branch Robinsons Run.

3. Thirteen months of field and laboratory study indicate the following maximum, minimum and weighted average parameters for source 4820:

	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	3.2	1.5	2.7
Flow (gpm)	150	10	32
Acidity (mg/l)	990	470	568
Iron (mg/l)	52.5	9.0	25.7
Manganese (mg/l)	7.0	4.0	5.3
Sulfate (mg/l)	1200	2250	1677
Hardness (mg/l)	1820	550	1131
Acid Load (lbs/day)	1782	60	272
Temperature (degrees C)	19	8	14

4. Calculations show that source 4820 supplies about 1% of the total average acid load contributed per day by the major sources into Chartiers Creek, based on thirteen months of readings. Analysis of the data shows that the source is a potential slugger (slugging index 6X).

B. Drainage

- I. Surface Drainage: Source 4820 flows into a southeasterly-flowing unnamed tributary that discharges its polluted waters into North Branch Robinsons Run.

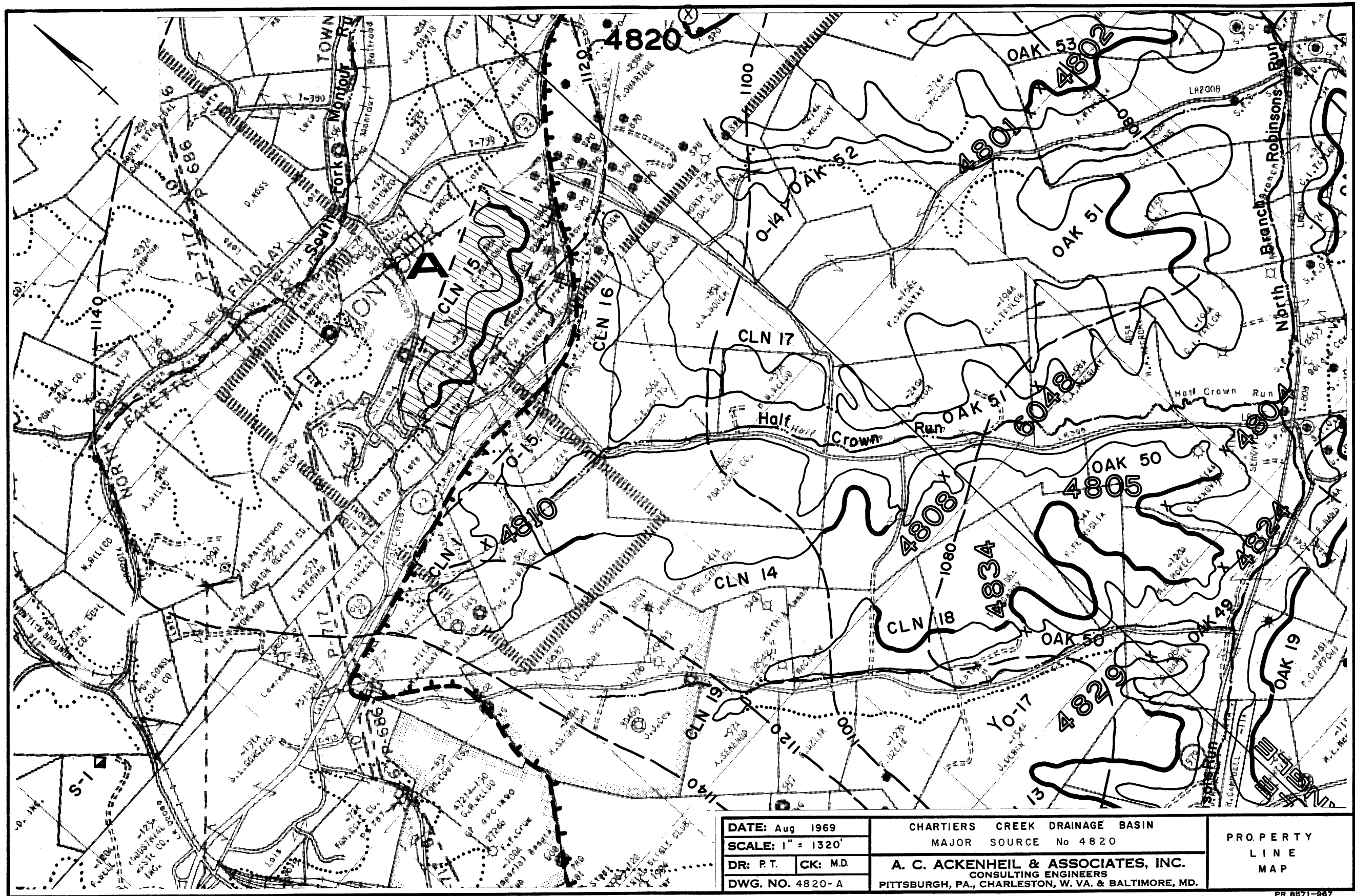
2. Subsurface Drainage: Structure contours constructed on the base of the Pittsburgh Coal show that the direction of the subsurface flow is to the southeast. No local variations are evident on the W.P.A. Carnegie No. I coal map. Drainage to the source is mostly from the north.

C. Field investigations and Abatement Methods

- I. North of source 4820 is strip mine OAK 62. This strip mine occupies about 32 acres. Interpretation of aerial photographs and deep mine maps indicates that possibly an opening into the deep mine exists in the highwall of the strip mine. The opening was not observed during our field investigation. The strip mine is classified as partially reclaimed with the grading so that the majority of drainage is away from the highwall.
2. Northwest of source 4820 is strip mine CLN 15 which occupies about 33 acres. The grading of the strip mine is such that the drainage is toward the highwall. We recommend improvement of the drainage through CLN 15 as a method to possibly reduce the slugging potential of source 4820 because this is the only strip mine in the area that appears to be contributing surface drainage to the deep mine.
3. Strip mine CLN 15 is mainly on the 88 acre tract of E. McMichael, et. al, and the 24-acre tract of J. H. McMichael. A small portion of the strip extends into the subdivided lots adjoining the J. H. McMichael property.

D. Cost of Methods of Abatement

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
<u>Area A:</u>		
I. Improve drainage through strip mine CLN 15	\$17,000	35%



MAJOR SOURCES 4816 - 4815 NORTH BRANCH ROBINSONS RUN

A. Description of the Source Area

1. Major sources 4816 and 4815 are located in North Fayette Township, Allegheny County, Pennsylvania, approximately two miles southeast of Imperial. The locations of the sources are shown on the enclosed Dwg. 4816-15 - A and on the OAKDALE 7-1/2 minute quadrangle included in Appendix All.
2. The discharge from source 4816 emerges from the ground in a man-made ditch about 200 ft. from an old mine entry. The ditch is approximately 10 ft. below the mine floor elevation.
3. The discharge from source 4815 emerges from an old mine entry and then flows through an old deep mine refuse pile. Small seepages and underground discharge merge with the main effluent before flowing into the unnamed tributary of North Branch Robinsons Run.
4. The area has been strip and deep mined. The deep mine where the two sources are located is part of an unnamed mine of Carnegie Coal Company of Oakdale. Northwest of the sources is the Margerum Mine of the Pittsburgh Coal Company.
5. Thirteen months of field and laboratory study indicate the following maximum, minimum and weighted average parameters for sources 4816 and 4815

Major Source 4816:	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	4.1	1.4	2.7
Flow (gpm)	250	15	52
Acidity (mg/l)	680	388	477
Iron (mg/l)	50.0	10.5	22.0
Manganese (mg/l)	12.0	1.6	4.7
Sulfate (mg/l)	2000	1175	1503
Hardness (mg/l)	1940	540	1066
Acid Load (lbs/day)	2040	88	338
Temperature (degrees C)	20	7	12
Major Source 4815:			
pH	4.0	1.2	2.7
Flow (gpm)	120	4	18
Acidity (mg/l)	780	336	595
Iron	75.0	17.0	33.1
Manganese (mg/l)	12.0	4.2	5.9
Sulfate (mg/l)	1875	1175	1513
Hardness (mg/l)	1710	530	991
Acid Load (lbs/day)	1123	16	156
Temperature (degrees C)	21.5	1.0	10.7

6. Calculations show that the two sources supply about 1.5% of the total average acid load contributed per day by the major sources into Chartiers Creek, based on thirteen months of readings. The slugging index of source 4816 is 6X and the slugging index of source 4815 is 10X. This indicates that these are potential sluggers.

B. Drainage

- I. Surface Drainage: The sources flow into an unnamed southeastflowing tributary of North Branch Robinsons Run.
2. Subsurface Drainage: The sources are probably located in a minor subsurface depression and receive surface water through strip mine OAK 54. Subsurface contours on the base of the Pittsburgh Coal indicate that the subsurface flow would be generally southeast. (See Dwg. 4816-15 - B.)

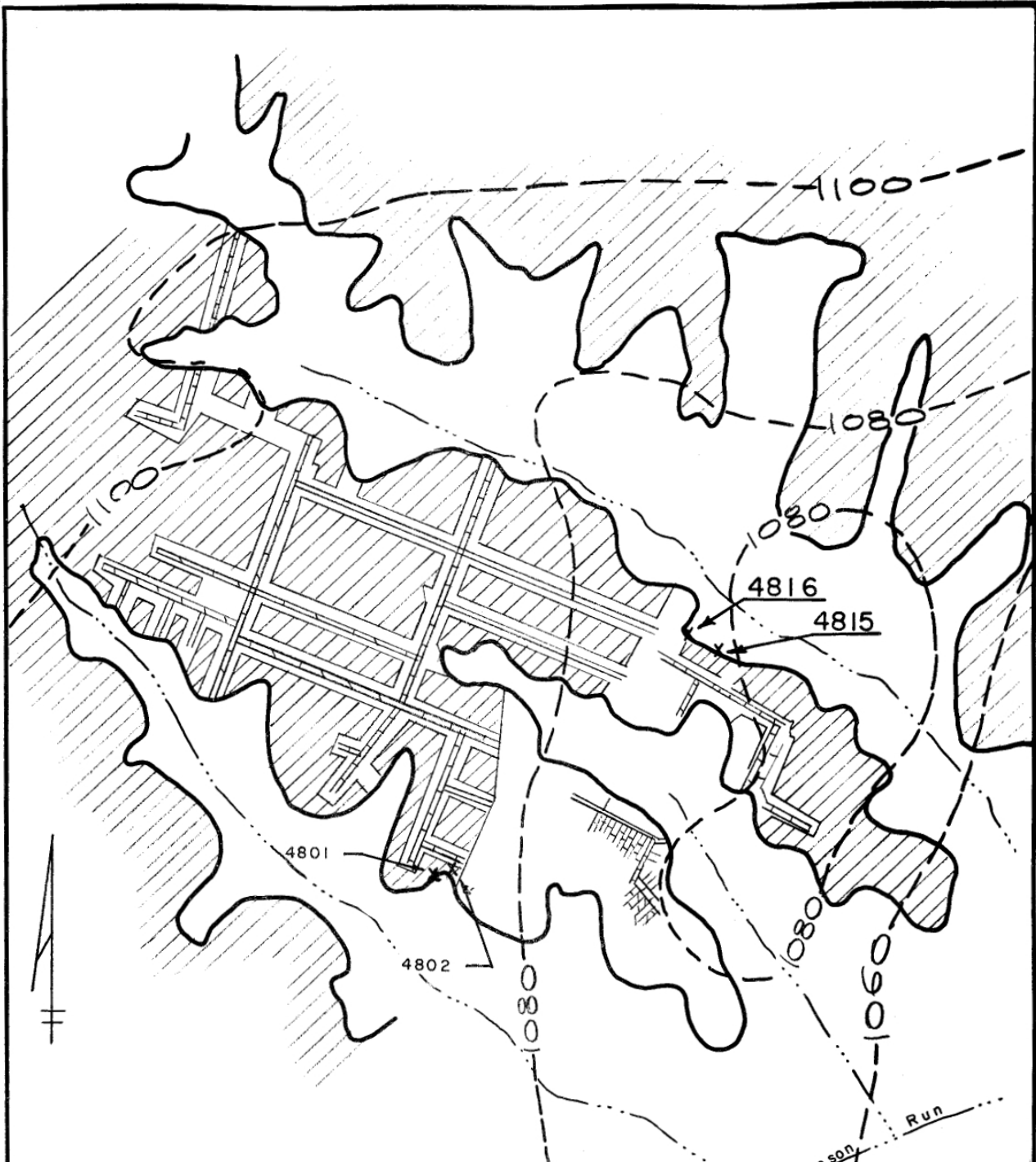
C. Field Investigations and Abatement Methods


- I. Field investigations and interpretation of aerial photographs indicate that the strip mine, OAK 54, on which the two major sources are located is randomly reclaimed with the surface drainage disrupted at various locations in the strip mine. The grading of the strip mine permits water to flow toward the highwall. The slugging index of sources 4816 - 4815 indicates that the surface waters are rapidly lost into the deep mine during times of precipitation. Improving the surface drainage through strip mine OAK 54 should reduce the pollution flow of sources 4816 - 4815.
2. Sources 4801 and 4802 will also benefit from the improvement in surface drainage recommended for strip mine OAK 54 as these sources are directly southwest of strip mine OAK 54 and at approximately the same subsurface elevation.
3. Major source 4820, which is located in the northern tip of strip mine OAK 54, is probably affected by strip mine CLN 15 located to the west of the source.
4. From northwest to southeast strip mine OAK 54 traverses the following properties: E. W. Ackman (unknown acres), F. Leonard (unknown acres), F. T. Hamm (69 acres), E. Baldigowski (51 acres), J. E. Baldigowski - owner at the sources (44 acres), and J. E. Poe (20 acres).

D. Cost of Methods of Abatement

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
<u>Area A:</u>		
Improve drainage through strip mine OAK 54	\$38,800	60%

An additional abatement measure such as the use of a box cut between strip mines OAK 53 and OAK 54 should be considered. Costs for this work have not been estimated but should be included during the design of abatement methods. The general location of the proposed box cut is shown on Dwg. 4816-15 - A.



- - - - - = Structure Contour At Base Of Pgh. Cool
 = Mined Out
 Mine Map Data From W.P.A. Map
 Carnegie Sheet No. 1

DATE: July 1969		CHARTERS CREEK DRAINAGE BASIN MAJOR SOURCES No:s. 4816 & 4815	DEEP MINE MAP
SCALE: 1" = 1200'			
DR: PT	CK: MTD	A. C. ACKENHEIL & ASSOCIATES, INC. CONSULTING ENGINEERS PITTSBURGH, PA. & CHARLESTON, W. VA.	
DWG. NO. 4816-15 - B			

10 7185 ALBANENS A. & B. SMITH CO., PGH., PA.

AI - 145

PR 8185-1623

AI-145

MAJOR SOURCE 4688 NORTH BRANCH ROBINSONS RUN

A. Description of the Source Area

1. Source 4688 is located in North Fayette Township, Allegheny County, Pennsylvania, approximately two miles north of Oakdale. The location of this source is shown on the enclosed Dwg. 4688 - A and on the OAKDALE 7-1/2 minute quadrangle included in Appendix AI I.
2. The discharge is a combination of two effluents, a strip pond draining a portion of a randomly reclaimed strip mine (OAK 48), and a hole at the base of a spoil bank draining another portion of the same strip mine. W.P.A. Carnegie Sheet No. 4 shows that the area has been deep mined as part of Pittsburgh Coal' Company's Cliff Mine complex.
3. Thirteen months of field and laboratory studies indicate the following maximum, minimum and weighted average parameters for major source 4688:

	<u>Maximum</u>	<u>Minimum</u>	<u>Average</u>
pH	4.3	2.0	3.2
Flow (gpm)	270	30	85
Acidity (mg/l)	438	214	320
Iron (mg/l)	6.25	1.2	3.3
Manganese (mg/l)	3.0	0.6	1.8
Sulfate (mg/l)	1450	700	1035
Hardness (mg/l)	1660	412	1004
Acid Load (mg/l)	1004	120	325
Temperature (degrees C)	33	5.0	13.6

4. Based on thirteen months of readings, source 4688 supplies less than 1% of the total average acid load contributed per day by the major sources into Chartiers Creek. Analysis of the data indicates that the source is a potential slugger with a slugging index of 3X.

B. Drainage

1. Surface Drainage: Source 4688 originates near the headwaters of an unnamed tributary to North Branch Robinsons Run. The tributary flows south parallel to McKee Road. The flow from source 4688 is the last major source of pollution to North Branch Robinsons Run.
2. Subsurface Drainage: Structure contours constructed on the base of the Pittsburgh Coal (see Dwg. 4688 - B) show that the source receives subsurface water from both northeast and northwest. The main direction of the subsurface flow is to the southwest.

C, Field Investigation and Abatement Methods

1. Field study and interpretation of aerial photographs Indicated that:
 - a. Area A: Strip mine OAK 48 is the strip mine from which source 4688 discharges. It occupies an area of. approximately 28 acres. Eleven of the acres are classified as unreclaimed; the remaining 17 acres are graded so drainage is away from the highwall. The Peoples Natural Gas Company's 12-In. gas line (P-908) cuts across the middle of the strip mine.
 - b. Area B: Strip mine OAK 30 is about 2500 ft. northeast of the source and the disturbed land occupies approximately 29 acres. Eighteen of the acres are classified as unreclaimed; the remaining 11 acres are graded so that the natural drainage is toward the highwall. Opening 0-16 occurs in the southern portion of the strip mine.
 - c. Area C: Strip mine OAK 58 is one mile north of the source near the community of Beechcliff and occupies about 49 acres. Thirty acres of this strip mine are unreclaimed; 15 acres are graded so that drainage is away from the highwall; and four acres are reclaimed.
 - d. Area D: Northwest of source 4688 is strip mine OAK 59 which occupies about 133 acres. Twenty-one acres in the eastern portion of this strip mine are graded so that the drainage of surface water is toward the highwall.
2. Improvement of the natural drainage through strip mines OAK 48, OAK 30, OAK 58 and OAK 59 should reduce the flow of acid water from this source.
3. Strip mines OAK 60 and OAK 61, which lie northwest of the source, could possibly contribute to the pollution of source 4006. However, due to lack of adequate subsurface information as to direction of flow in the deep mines, corrective measures in these strip mines as related to source 4688 are not recommended at this time.

D. Cost of Methods of Abatement

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
<u>Area A:</u> F. Pangersic (10 acres), A. Stefanic (19 acres), W. Pangersic (42 acres), North Star Coal Co. (75 acres)		
1. Improve drainage through strip mine OAK 48	\$17,500	9
Sub-Total:	\$17,500	9%

<u>Description</u>	<u>Estimated Cost</u>	<u>Estimated Per Cent Flow Reduction</u>
<u>Area B:</u> C. K. Jones (48 acres), W. E. Easton (60 acres), J.M. McMichael (43 acres), J.W. Campbell (83 acres)		
1. Improve the drainage through strip mine OAK 30 and close opening 0-16	\$33,500	25
Sub-Total:	\$51,000	34%
<u>Area C:</u> F. W. Davis (37 acres), G. E. Christopher (14 acres), F. W. McKee (19 acres), W. Tanchak (25 acres), W. W. McNamee (162 acres), J. A. Cooper (90 acres), lots		
1. Improve the surface drainage through portions of strip mine OAK 58	\$15,800	25
Sub-Total:	\$66,800	59%
<u>Area D:</u> North Star Coal Co. (19 acres), G. F. Heinlen (10 acres), J. F. Rowland (23 acres), Land, Inc. (22 acres), E. E. McBride (80 acres) and A. Krawchyk (63 acres). (Hanky Farms Plan and Hachmeister, Inc. - acreages unknown.)		
1. Improve surface drainage through portions of strip mine OAK 59	\$13,900	8
TOTAL:	\$80,700	67%



DATE: July 1969		CHARTIERS CREEK, DRAINAGE BASIN		DEEP MINE MAP
SCALE: 1"=1200'		MAJOR SOURCE NO 4688		
DR: S.K	CK: I.H	A. C. ACKENHEIL & ASSOCIATES, INC. CONSULTING ENGINEERS PITTSBURGH, PA. & CHARLESTON, W. VA.		
DWG. NO. 4688-B				

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