

STUDY RESULT

## STUDY RESULTS

### STREAM QUALITY

Water analysis of samples collected from February 17, 1972 through June 8, 1972, indicate that the entire reaches of Big Run is alkaline and only slightly degraded by acid mine drainage. The pH in the upper reaches of the stream averages 7.13 and has an average alkaline concentration of about 34.5 mg/l. The pH at the mouth of Big Run averages 6.68 with an average alkaline concentration of 11.31 mg/l. Big Run delivers approximately 1,647 lbs. of alkalinity per day to Little Sandy Creek. The effect of Big Run upon Little Sandy Creek can be illustrated by sampling results obtained from points above and below the mouth of Big Run. On Little Sandy Creek upstream from the mouth of Big Run, the pH averages 6.70 with an average alkaline concentration of 8.25 mg/l. Downstream from the mouth of Big Run the average alkaline concentration in Little Sandy Creek is 11.25 mg/l with an average pH of 6.53.

There are several known active mining or mine drainage permits in existence within the watershed.

The public use of Big Run and Little Sandy Creek is essentially high as the Fish Commission currently stocks the streams with trout and much aquatic life was in evidence during the course of the study.

As Big Run does little to degrade the quality of Little Sandy Creek, much of which is comprised of a series of pools and riffles, its recreational potential as a game fishery is excellent. The Big Run

Watershed and Little Sandy Creek, has excellent potential for continuing to provide an outdoor recreation setting to augment those of the nearby State Game Lands No. 31.

#### SAMPLING AND MEASURING RESULTS

Sampling and flow measurements were taken at seventeen (17) stream and pollution sources. The locations of these sampling stations are shown on the sampling station location drawing. The sampling results are shown on the Exhibits entitled, "Sampling Data". The data provided are all the sampling results compiled during the course of the study. THE

#### SULFATE MATERIALS BALANCE

The sulfate ion is present in coal mine drainage in Pennsylvania without exception, and has concentrations in the range of 300 mg/l to 10,000 mg/l.

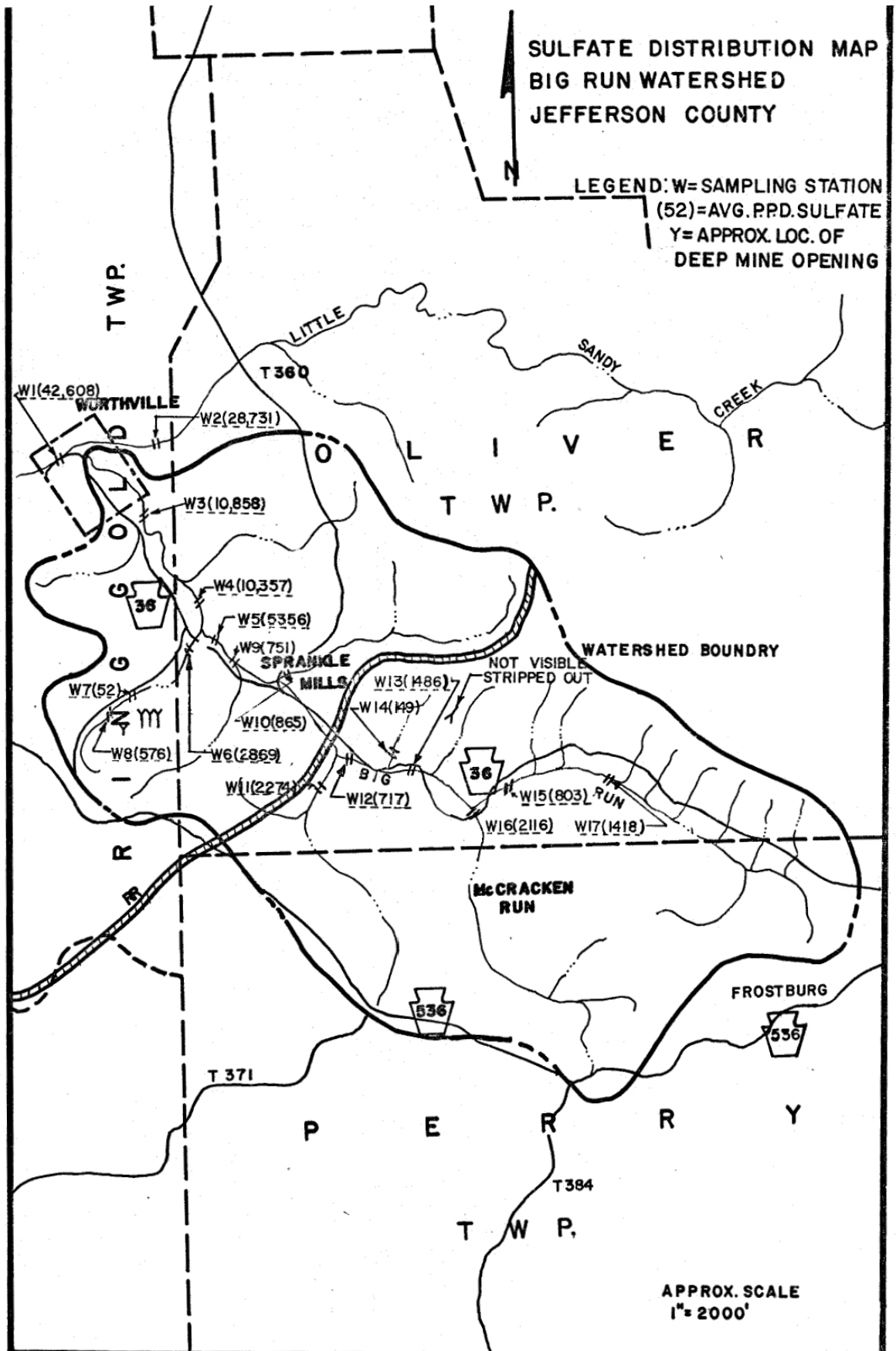
The sulfate concentration from an abandoned deep mine located approximately 2 miles upstream from the mouth of Big Run (8) averages 397.5 mg/l. The discharges are acidic with an average pH of 3.00. Another abandoned deep mine located approximately 1.75 miles upstream from the mouth of Big Run (7) averages 340.3 mg/l with an average pH of 3.6. All high acid discharges would be expected to have sulfates

in the concentration ranges noted above for the two deep mine discharges.

The sulfate ion will not significantly degrade or precipitate from solution, particularly at the relatively stable pH conditions found in natural waters. This allows the use of the ion as an indicator to account for total pollution inputs to a surface stream. Accordingly, a sulfate material balance was prepared and shown in the exhibit entitled, "Sulfate Distribution Map."

**SULFATE DISTRIBUTION MAP  
BIG RUN WATERSHED  
JEFFERSON COUNTY**

**LEGEND: W= SAMPLING STATION  
(52)=AVG. PPD. SULFATE  
Y= APPROX. LOC. OF  
DEEP MINE OPENING**



## ACID LOAD DISTRIBUTION

The following exhibit shows the distribution of "average" acid loads throughout the watershed. It is not possible to show a percentage distribution for the acid, since it is really somewhat of a fallacy to show even "average" acid loadings. This data is based on all samples taken over the course of the study, and do not reflect the "slugging" effects of trapped pools released by heavy rainfall or the other varying conditions that affect acid loadings.

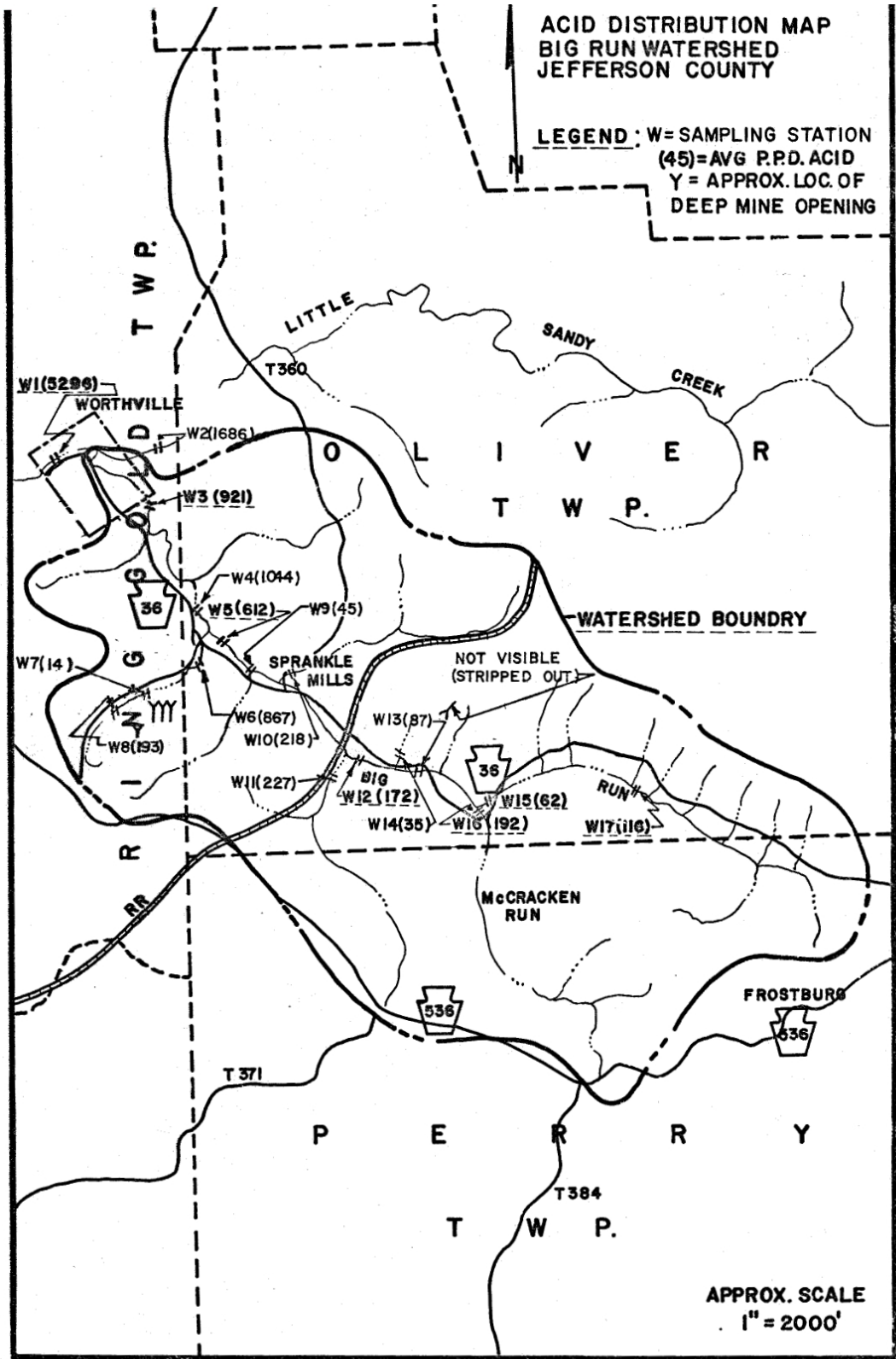
However, the exhibit is useful as visual guide to the geographical areas within the watershed that are usually responsible for most of the high acid loads.

## OTHER LOAD DISTRIBUTIONS

The following exhibits are shown as a visual aid to the geographic areas, particularly the sampling points or weir locations, within the watershed that are responsible for loadings of alkalinity and total iron. The purpose of these exhibits is to show the overall effect of the above elements to the condition of Big Run Watershed.

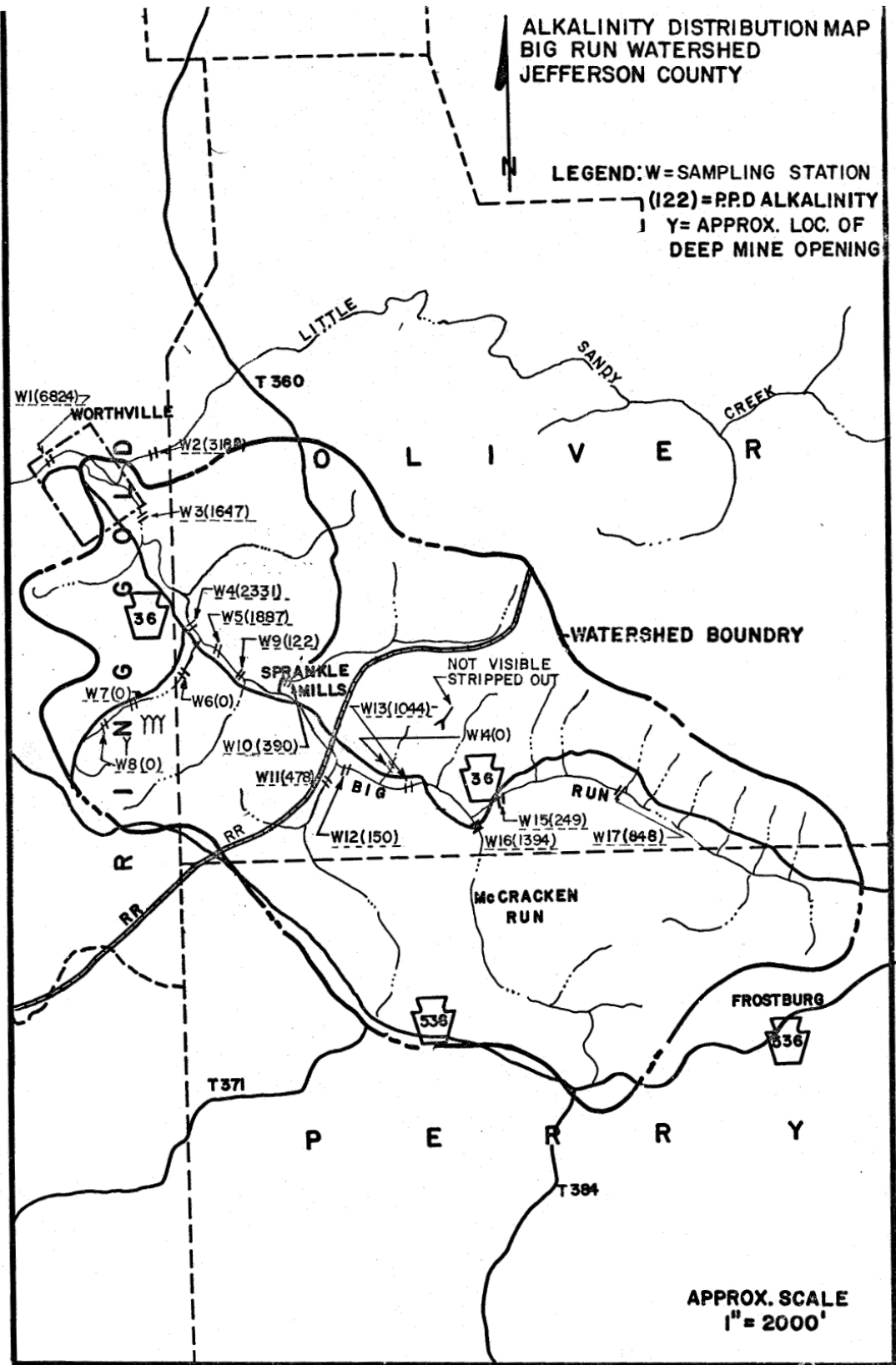
**ACID DISTRIBUTION MAP  
BIG RUN WATERSHED  
JEFFERSON COUNTY**

**LEGEND:** W = SAMPLING STATION  
(45) = AVG P.P.D. ACID  
Y = APPROX. LOC. OF DEEP MINE OPENING



ALKALINITY DISTRIBUTION MAP  
BIG RUN WATERSHED  
JEFFERSON COUNTY

LEGEND: W = SAMPLING STATION  
(122) = RPD ALKALINITY  
Y = APPROX. LOC. OF DEEP MINE OPENING

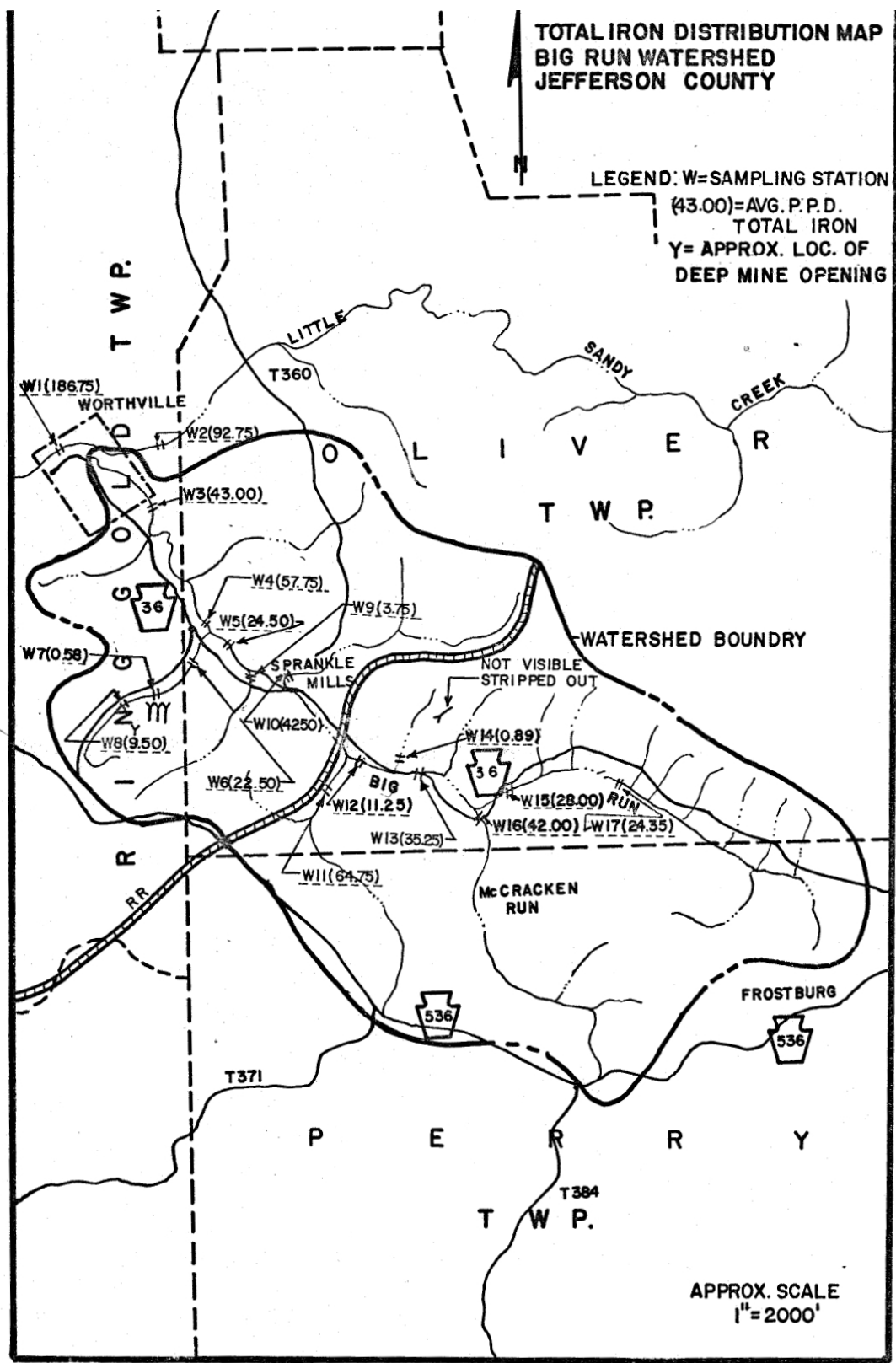


APPROX. SCALE  
1" = 2000'

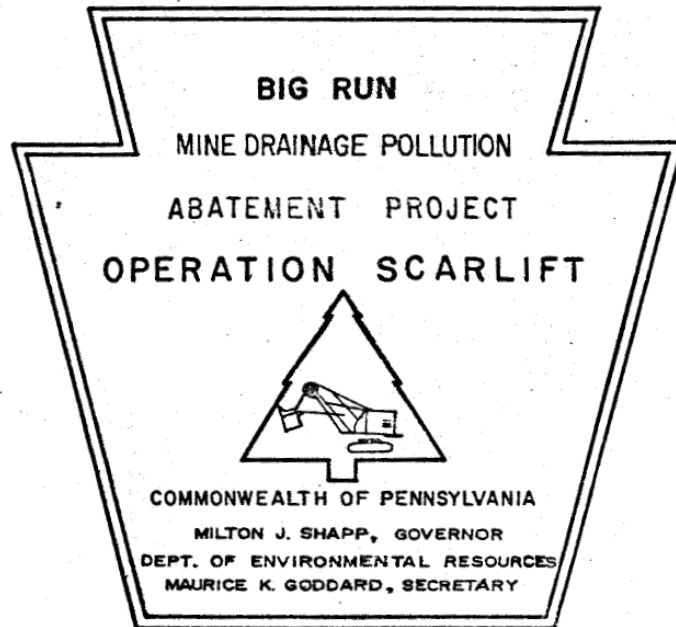


**TOTAL IRON DISTRIBUTION MAP  
BIG RUN WATERSHED  
JEFFERSON COUNTY**

**LEGEND: W=SAMPLING STATION  
(43.00)=AVG. P.P.D.  
TOTAL IRON  
Y= APPROX. LOC. OF  
DEEP MINE OPENING**



APPROX. SCALE  
1" = 2000'



OTHER POLLUTION SOURCES

## OTHER POLLUTION SOURCES

Several other pollution sources exist within the watershed. These are refuse piles located near abandoned deep and surface mines and are described as follows:

### REFUSE PILES

Two refuse piles are located within the limits of the watershed. One is located in and around the strip mined area just west of Township Road 368 and south of Township Road 383, the other is located near the Richard Beckman deep mine and is shown near the deep mine opening which is stripped out and is not visible on the "Mine Refuse Locations" exhibit. As these refuse piles do not significantly contribute to the pollution to Big Run, no abatement procedures are recommended at this time.

