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FLOOD PLAIN INFORMATION, EAST BRANCH PERKIOMEN CREEK, BUCKS COU--ETC(U)
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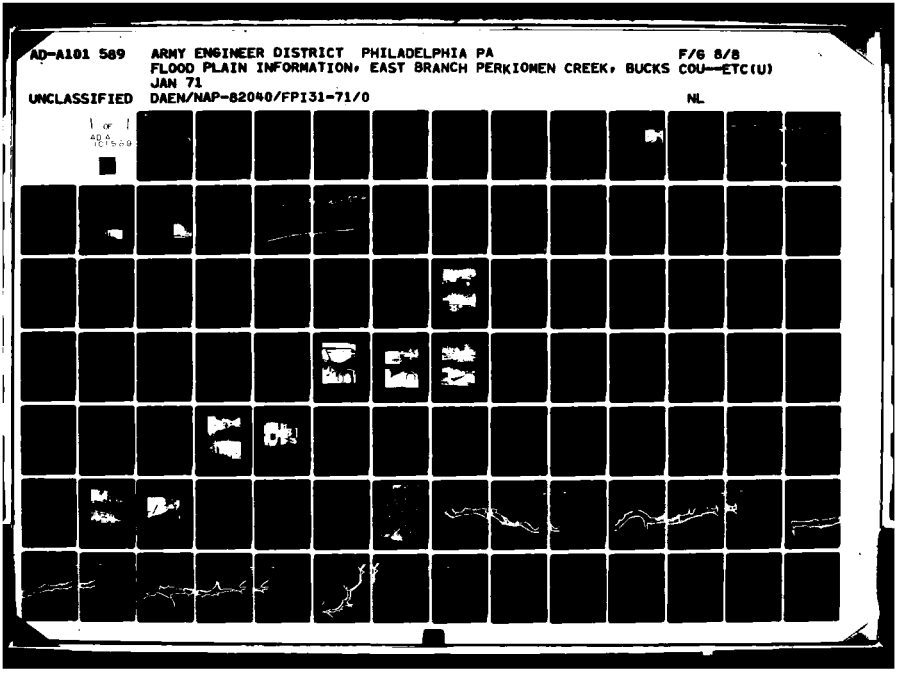
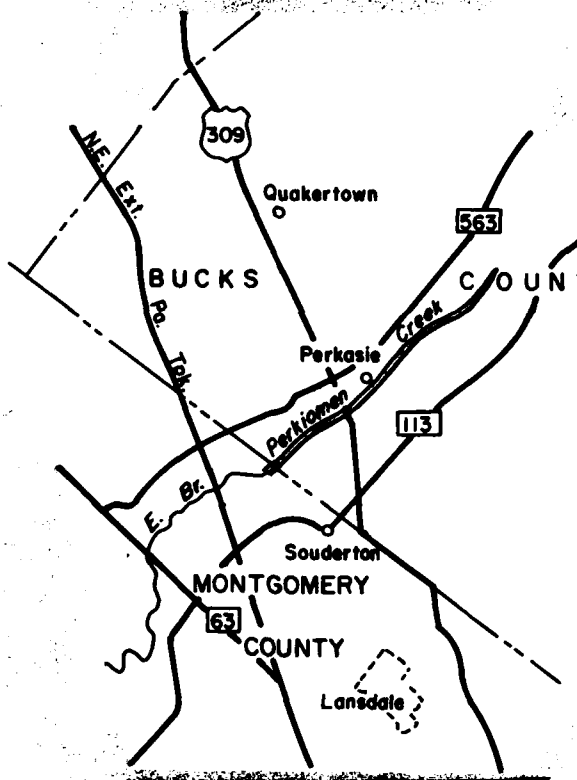


FLOOD PLAIN INFORMATION

EAST BRANCH PERKIOMEN CREEK

BUCKS COUNTY PENNSYLVANIA

LEVEL II



Original contains color plates: All DTIC reproductions will be in black and white

PREPARED FOR
BUCKS COUNTY PLANNING COMMISSION
AND
PENNSYLVANIA DEPARTMENT OF FORESTS AND WATERS
BY
CORPS OF ENGINEERS, U. S. ARMY
PHILADELPHIA DISTRICT
JANUARY 1971

REPT. NO: DAEN/NAP-82040/FPI31-71/01

FLOOD PLAIN INFORMATION - EAST BRANCH PERKIOMEN CREEK, BUCKS COUNTY, PENNSYLVANIA

TO THE REQUESTOR:

This Flood Plain Information (FPI) Report was prepared by the Philadelphia District office of the U.S. Army Corps of Engineers, under the continuing authority of the 1960 Flood Control Act, as amended. The report contains valuable background information, discussion of flood characteristics and historical flood data for the study area. The report also presents through tables, profiles, maps and text, the results of engineering studies to determine the possible magnitude and extent of future floods, because knowledge of flood potential and flood hazards is important in land use planning and for management decisions concerning floodplain utilization. These projections of possible flood events and their frequency of occurrence were based on conditions in the study area at the time the report was prepared.

Since the publication of this FPI Report, other engineering studies or reports may have been published for the area. Among these are Flood Insurance Studies prepared by the Federal Insurance Administration of the Federal Emergency Management Agency, Flood Insurance Studies generally provide different types of flood hazard data (including information pertinent to setting flood insurance rates) and different types of floodplain mapping for regulatory purposes and in some cases provide updated technical data based on recent flood events or changes in the study area that may have occurred since the publication of this report.

It is strongly suggested that, where available, Flood Insurance Studies and other sources of flood hazard data be sought out for the additional, and, in some cases, updated flood plain information which they might provide. Should you have any questions concerning the preparation of, or data contained in this FPI Report, please contact:

U.S. Army Corps of Engineers
Philadelphia District
Custom House, 2nd and Chestnut Streets
Philadelphia, PA 19106

ATTN: Flood Plain Mgt. Services Branch, NAPEN-M

Telephone number: (215) 597-4807

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

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3. RECIPIENT'S CATALOG NUMBER	
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11. CONTROLLING OFFICE NAME AND ADDRESS: U.S. Army Engineer District Philadelphia, 2nd & Chestnut Sts., Philadelphia, PA 19106	12. REPORT DATE: Jan 1971 13. NUMBER OF PAGES: 60
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*	15. SECURITY CLASS. *(of this report)*: UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

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18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Perkiomen Creek, Pa.
Bucks County Planning Commission
Pa. Dept. of Forest and Waters
Bucks County, Pa.
Floods
Flood forecasting
Flood plains

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report covered the flood situation along the East Branch Perkiomen Creek starting from the dam located about 0.74 miles downstream from the Montgomery-Bucks County line (County Line Rd.) and extending upstream thru the boroughs of Sellersville and Perkasie, 12.0 miles to its headwaters in Bedminster Township, Bucks County, Pa. It was based upon information on rainfall runoff, historical flood heights and other technical data bearing upon the occurrence and size of floods within the study area. Flood profiles, cross sections, maps and photographs were included.

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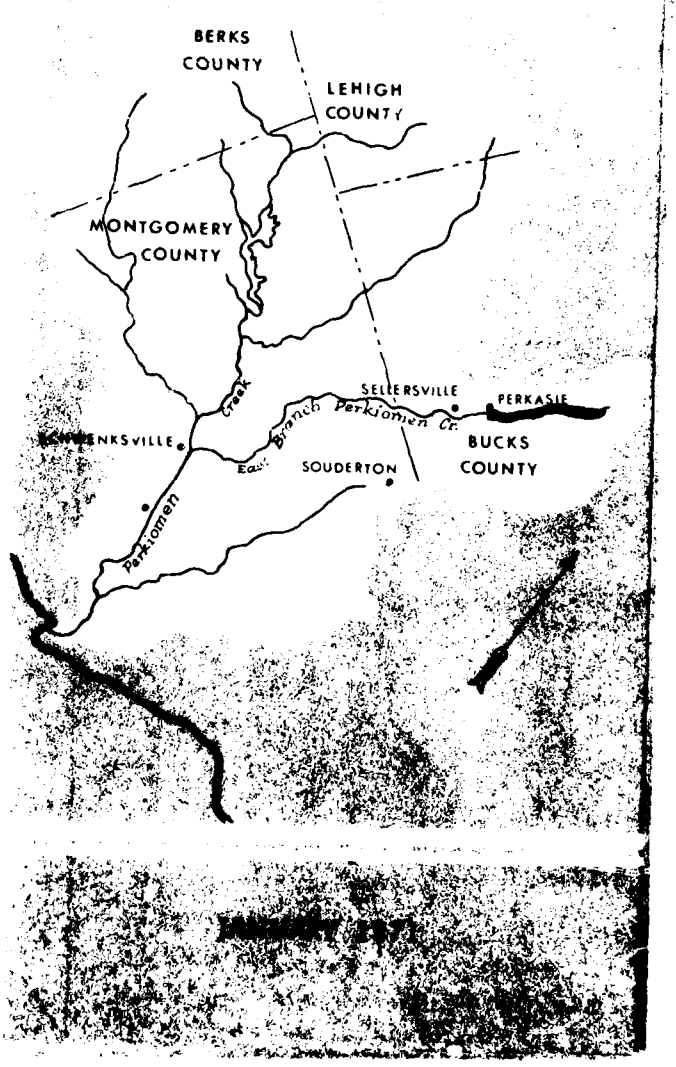
SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

Under authority of Section 206 of the 1960 Flood Control Act as amended the flood plain information was prepared by the U.S. Army Corps of Engineers Philadelphia District at the request of the Bucks County Planning Commission. The information should be considered for its historical nature. Since the publication of this FPI report other Flood Insurance studies have been undertaken and should also be consulted for more current information.

FLOODS IN PERKASIE VICINITY, PENNSYLVANIA

—— How to Avoid Damage



FLOODS IN PERKASIE VICINITY, PENNSYLVANIA

Normally, the flow of water in a stream is contained within its banks. However, when floods occur, the water spills onto the flat areas along the banks known as the "flood plain". This flooding of the adjacent bank areas acts as a safety valve. The East Branch Perkiomen Creek has overflowed its banks many times in the past.

During many of its past floods, East Branch Perkiomen Creek rose only high enough to affect some roads and bridges. Some floods such as the ones that occurred in 1942 and 1960 were high enough to cause extensive damage to properties along the stream. As time passes, increased residential and commercial development will cause an even greater demand for building sites along the creek. This encroachment onto the flood plain could result in increased flood heights and a greater flood damage potential.

Recurring damages need not happen. Information to guide safe community development and methods for reducing future flood damages are avail-

able. Realizing the damage that may occur in the flood plains along East Branch Perkiomen Creek, the Bucks County Planning Commission feels that all citizens should be aware that large floods may be expected and that flood damage can be greatly reduced only if proper precautionary measures are taken now.

PAST FLOODS

The greatest floods known to have occurred on East Branch Perkiomen Creek were the floods of August 9, 1942 and September 12, 1960. These two floods were about equal in magnitude. In the vicinity of the Branch Road bridge, the August 9, 1942 flood reached an elevation of 328.9 feet above mean sea level datum. The September 12, 1960 flood was only slightly below this elevation.

FUTURE FLOODS

Floods larger than those of the past can occur. Studies of this area indicate that future floods could be significantly greater than past floods.

The map and profile on the reverse side show the extent of the flooded

areas during an Intermediate Regional Flood, shown in light blue, and during a Standard Project Flood, shown in dark blue. The Intermediate Regional Flood is defined as a flood which will occur once in 100 years on the average, but it could occur at any time. The flood of August 9, 1942 had approximately the same magnitude as the Intermediate Regional Flood in this vicinity. The Standard Project Flood represents a reasonable upper limit of expected flooding. This flood would inundate a greater portion of the flood plain because of its deeper flows and wider extent. The profile shows the varying heights that both floods would reach in the area. By comparing the map with the profile, the flood heights can be obtained at any location.

The photograph shows the Intermediate Regional Flood and the Standard Project Flood heights in the vicinity of the Bucks Road bridge.

POSSIBLE SOLUTIONS

There are means of protecting buildings against flood waters and some of them can be handled by the individuals involved. These include the

Photograph shows possible future flood heights at Bucks Road bridge.

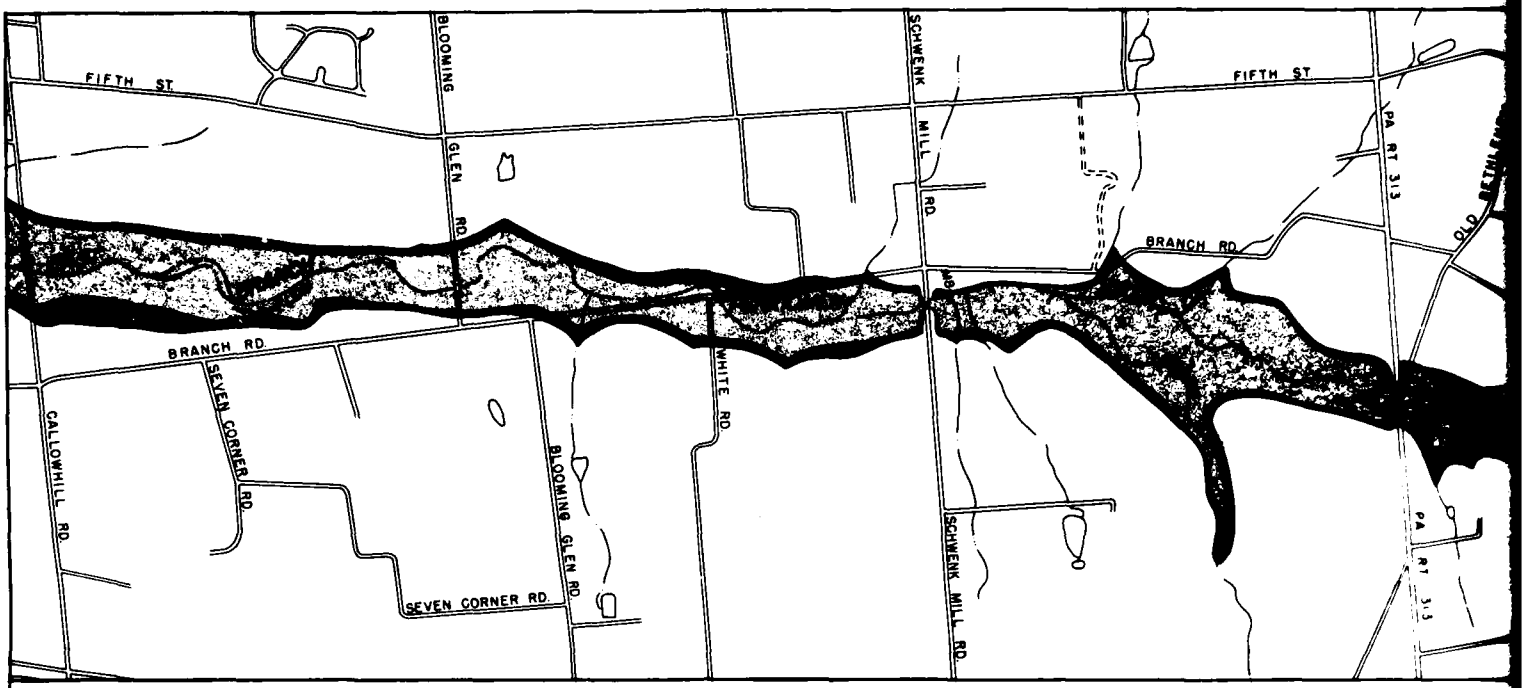
permanent or temporary closure of lower openings, the use of flap gates on sewer lines, the waterproofing of walls and floors and the provision of removable bulkheads for the temporary protection of exposed entrances. There are also many ways in which the community at large can eliminate or reduce the flood damage potential. Regulating development in the flood plain is one way to reduce potential flood damages. This can be accomplished through zoning and building restrictions. Scores of communities have adopted such regulations. Some

towns have turned flood plain areas into parks and playgrounds as in the Perkasie-Sellersville area of the East Branch. There are many uses for flood plains that allow the land to serve both the needs of the community and the needs of the creek in time of flood.

The next step is up to you. Information on protecting your own property and for developing a sound flood plain management program for your community can be obtained through the Bucks County Planning Commission.

* * *

This folder has been prepared for Bucks County by the Corps of Engineers from data in the report "Flood Plain Information, East Branch Perkiomen Creek, Bucks County, Pennsylvania". Copies of that report and this folder are available from the Bucks County Planning Commission, Natural Resources Division, Bucks County Administration Building, Doylestown, Pennsylvania 18901, and the Pennsylvania Department of Forests and Waters, South Office Building, Harrisburg, Pennsylvania 17120.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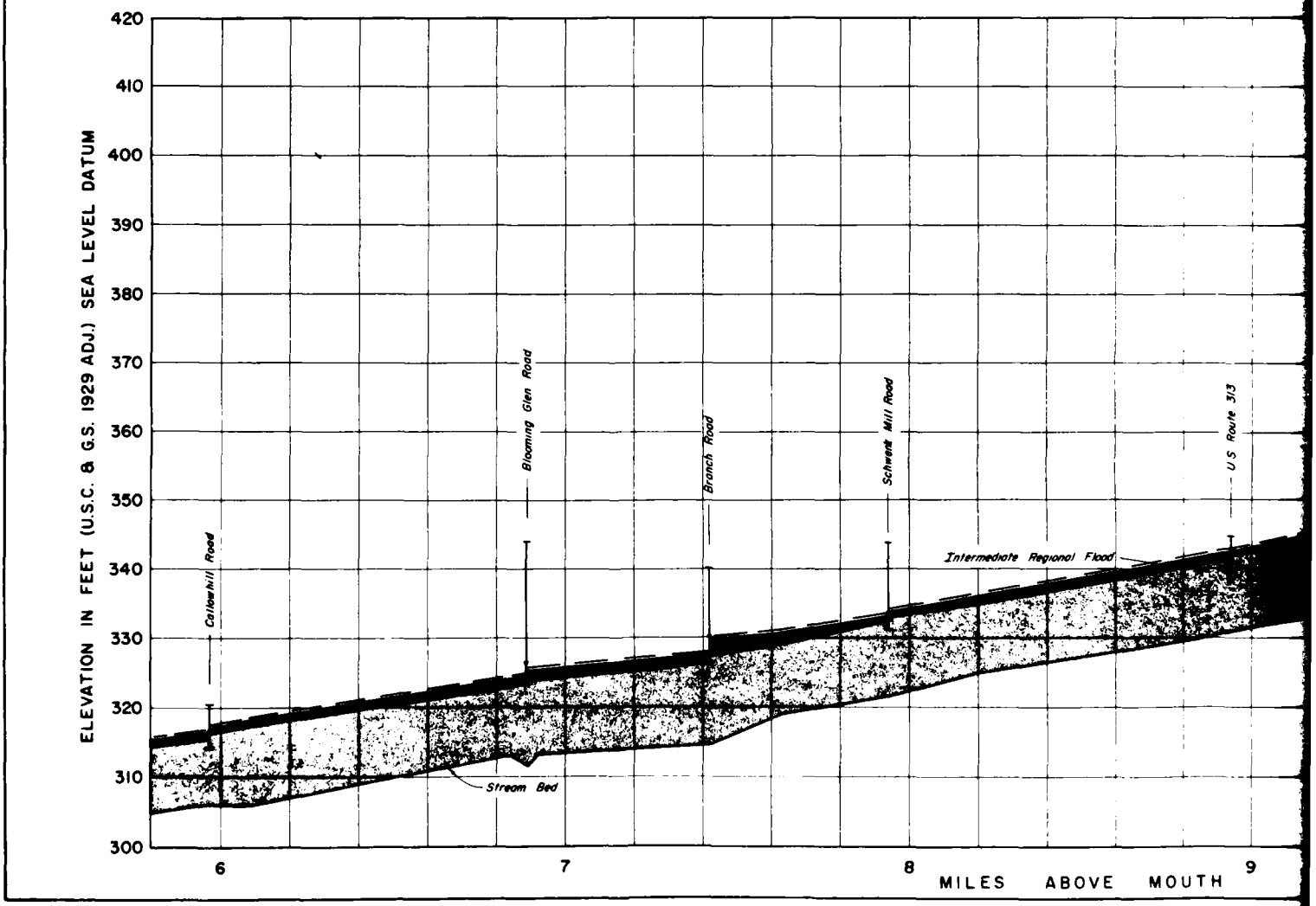
BLOOMING GLEN RD.
SCHWENK MILL RD.
FIFTH ST.
PA RT 313
BRANCH RD.
OLD BETHLEHEM
BRANCH RD.
SEVEN CORNER RD.
CALLOWHILL RD.
WHITE RD.
BLOOMING GLEN RD.
SEVEN CORNER RD.
SCHWENK MILL RD.
PA RT 313


ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM
420
410
400
390
380
370
360
350
340
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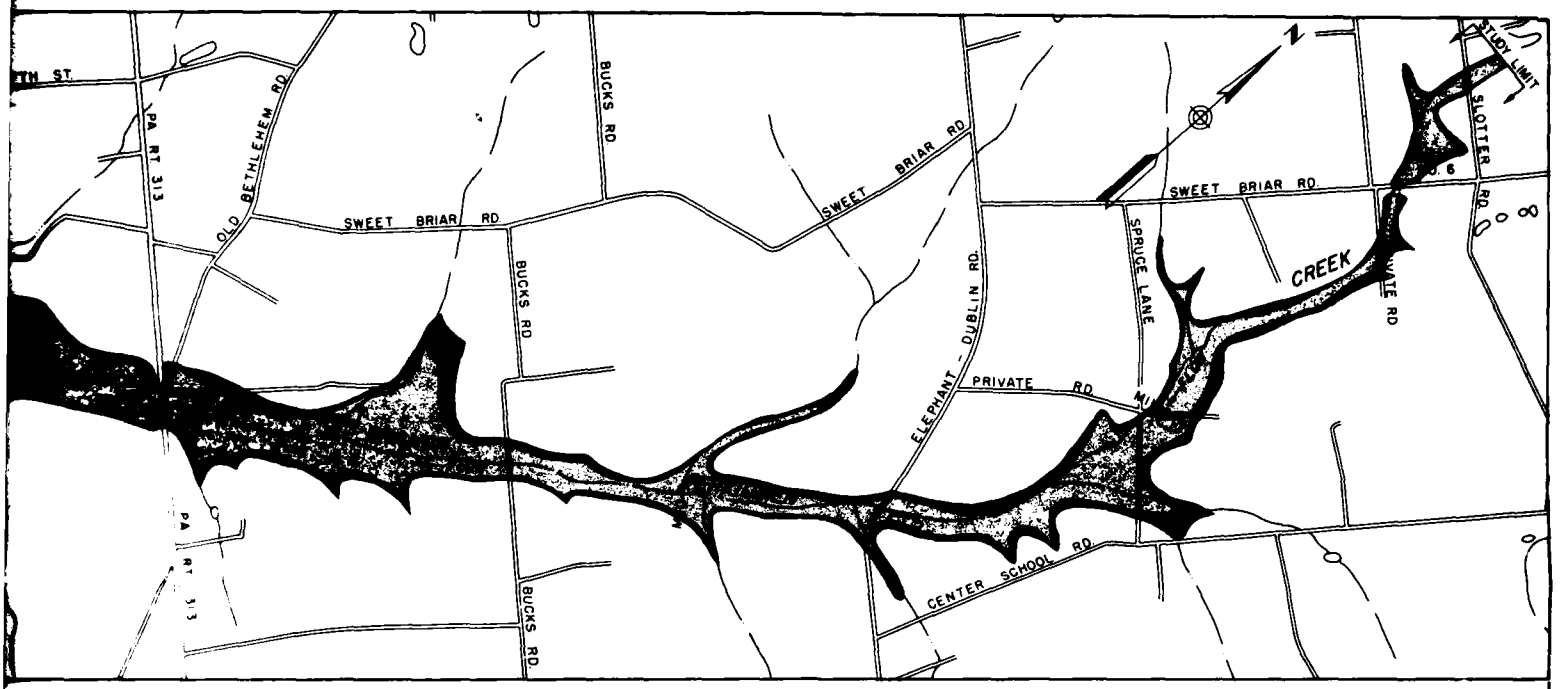
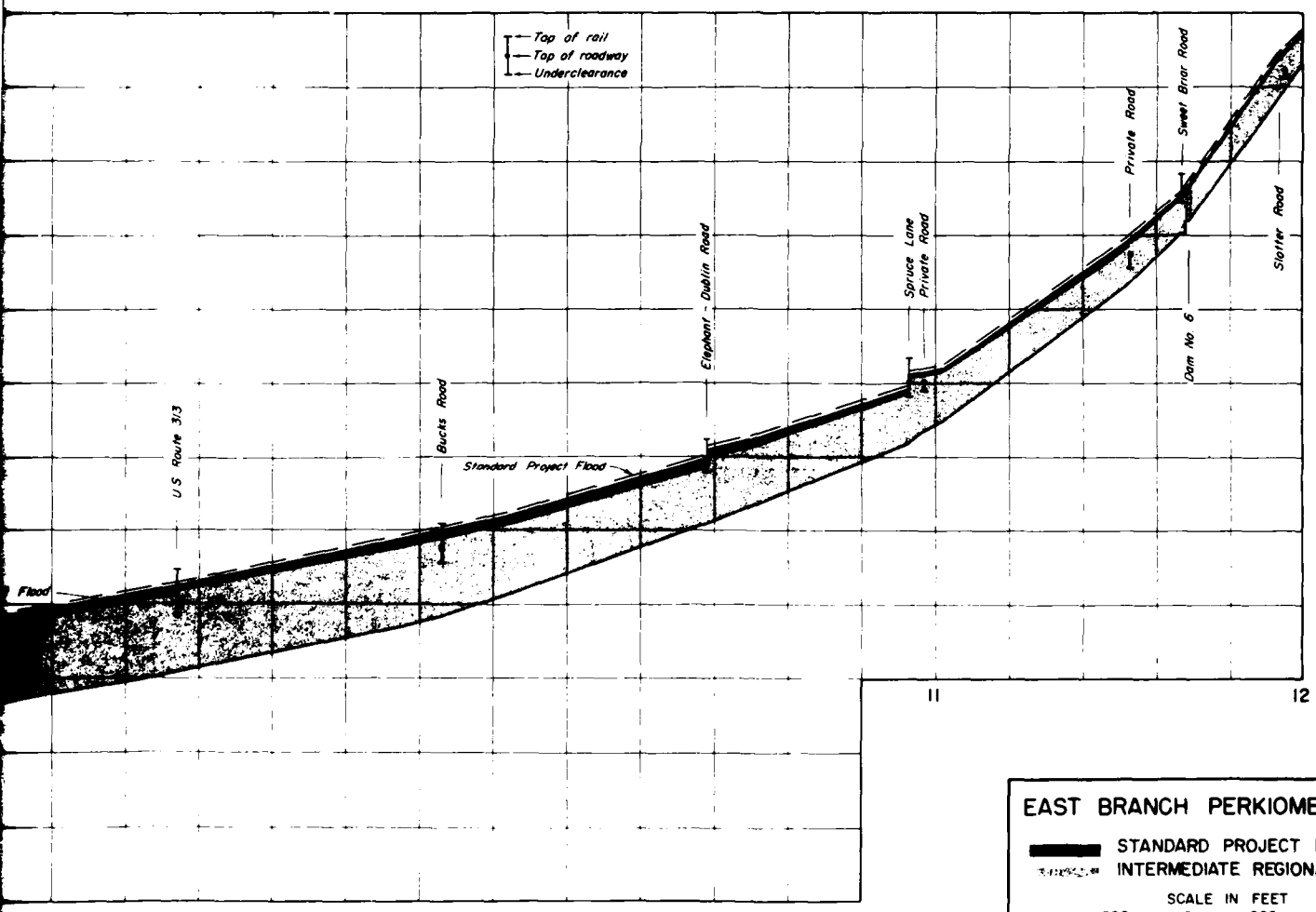
320
310
300
Callowhill Road
Blooming Glen Road
Branch Road
Schwenk Mill Road
U.S Route 313
Intermediate Regional Flood
Stream Bed
6
7
8
9
MILES ABOVE MOUTH





OVE MOUTH

EAST BRANCH PERKIOMEN CREEK

STANDARD PROJECT FLOOD

INTERMEDIATE REGIONAL FLOOD

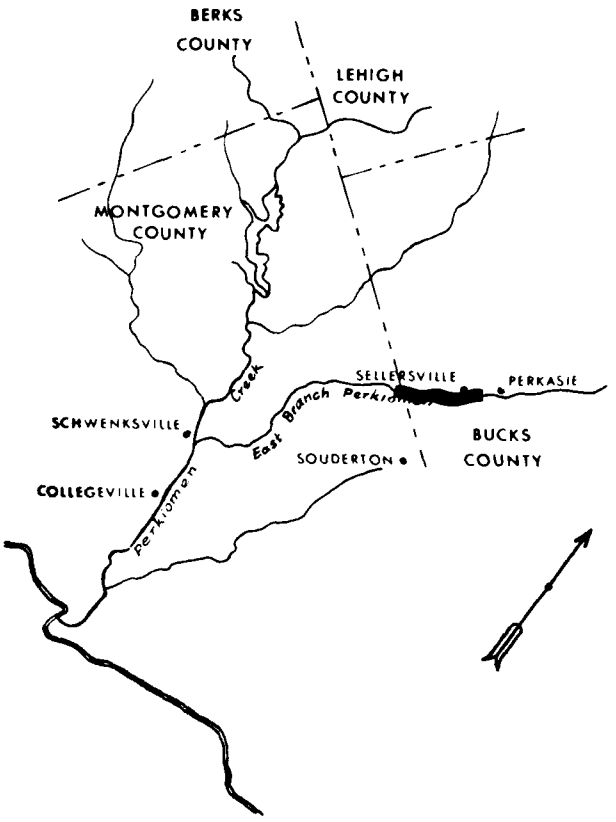
SCALE IN FEET

800 0 800 1600

12

FLOODS IN SELLERSVILLE VICINITY, PENNSYLVANIA

— — How to Avoid Damage



JANUARY 1971

FLOODS IN SELLERSVILLE VICINITY, PENNSYLVANIA

Normally, the flow of water in a stream is contained within its banks. However, when floods occur, the water spills onto the flat areas along the banks known as the "flood plain". This flooding of the adjacent bank areas acts as a safety valve. The East Branch Perkiomen Creek has overflowed its banks many times in the past.

During many of its past floods, East Branch Perkiomen Creek rose only high enough to affect some roads and bridges. Some floods such as the ones that occurred in 1942 and 1960 were high enough to cause extensive damage to properties along the stream. As time passes, increased residential and commercial development will cause an even greater demand for building sites along the creek. This encroachment onto the flood plain could result in increased flood heights and a greater flood damage potential.

Recurring damages need not happen. Information to guide safe community development and methods for reducing future flood damages are available. Realizing the damage that may occur in the flood plains along East Branch Perkiomen Creek, the Bucks County Planning Commission feels that all citizens should be aware that large floods may be expected and that flood damage can be greatly reduced only if proper precautionary measures are taken now.

PAST FLOODS

The greatest floods known to have occurred on East Branch Perkiomen Creek were the floods of August 9, 1942 and September 12, 1960. These two floods were about equal in magnitude. At the Sellersville sewage disposal plant, the September 12, 1960 flood reached an elevation of 301.7 feet above mean sea level datum and the August 9, 1942 flood reached an elevation of 301.5 feet above mean sea level datum at the same location.

Photograph 1 - U. S. Route 309 in Sellersville. August 9, 1942

FUTURE FLOODS

Floods larger than those of the past can occur. Studies of this area indicate that future floods could be significantly greater than past floods.

The map and profile on the reverse side show the extent of the flooded areas during an Intermediate Regional Flood, shown in light blue, and during a Standard Project Flood, shown in dark blue. The Intermediate Regional Flood is defined as a flood which will occur once in 100 years on the average, but it could occur at any time. The floods of August 9, 1942 and September 12, 1960 were about equal in magnitude to the Intermediate Regional Flood throughout this general area. The Standard Project Flood represents a reasonable upper limit of expected flooding. This flood would inundate a greater portion of the flood plain because of its deeper flows and wider extent. The profile shows the varying heights that both floods would reach in the area. By camparing the map with the profile, the flood heights can be obtained at any location.

Photograph 1 shows the August 9, 1942 flood in the vicinity of the U. S. Rt. 309 bridge in Sellersville. Photograph 2 shows flood heights for the

Intermediate Regional, the Standard Project and the August 9, 1942 floods in the same vicinity.

POSSIBLE SOLUTIONS

There are means of protecting buildings against flood waters and some of them can be handled by the individuals involved. These include the permanent or temporary closure of lower openings, the use of flap gates on sewer lines, the waterproofing of walls and floors and the provision of removable bulkheads for the temporary protection of exposed entrances. There are also many ways in which the community at large can eliminate or reduce the flood damage potential.

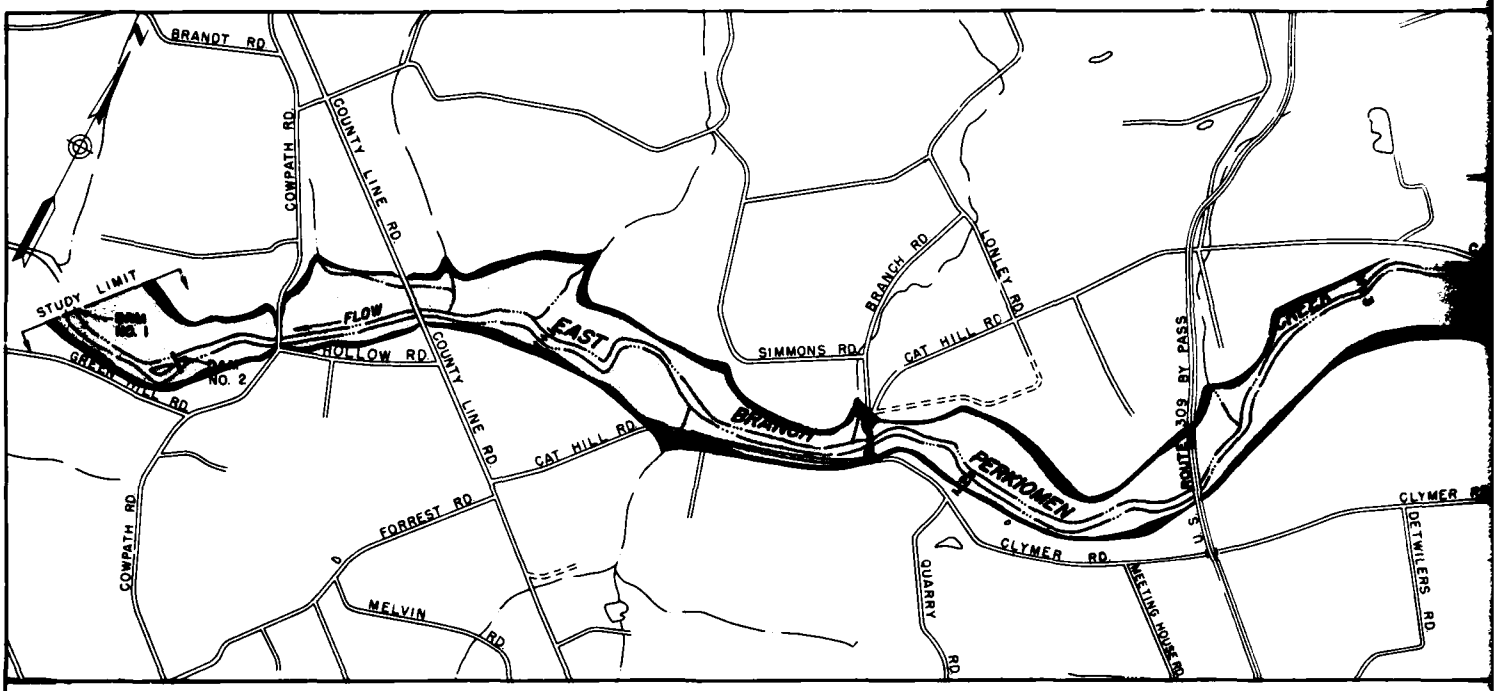
Photograph 2 - Past and future flood heights in the vicinity of U. S. Rt. 309 bridge at Sellersville.

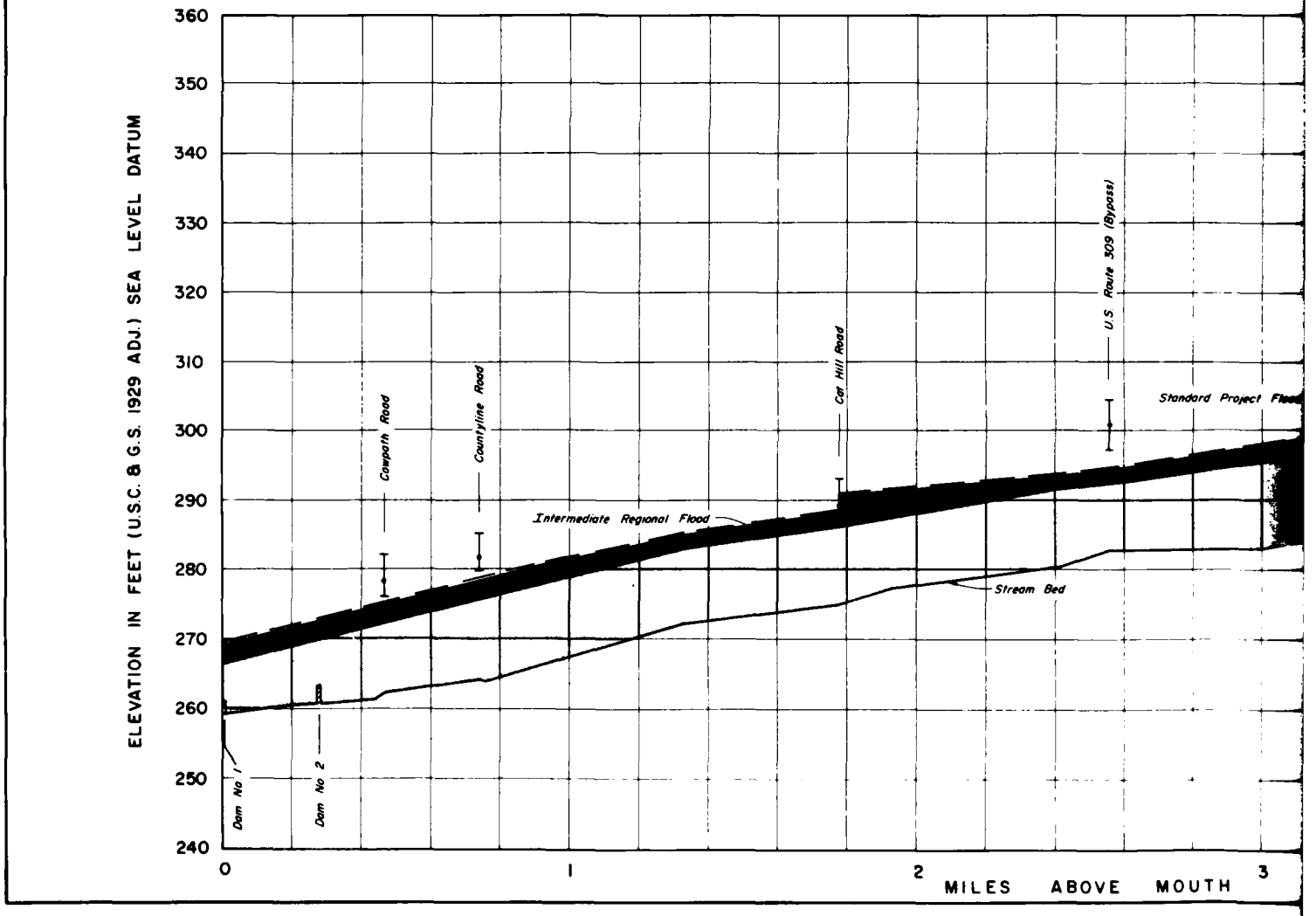
Regulating development in the flood plain is one way to reduce potential flood damages. This can be accomplished through zoning and building restrictions. Scores of communities have adopted such regulations. Some towns have turned flood plain areas into parks and playgrounds as in the Perkasie-Sellersville area of the East Branch. There are many uses for flood plains that allow the land to serve both the needs of the community and the needs of the creek in time of flood.

The next step is up to you. Information on protecting your own property and for developing a sound flood plain management program for your community can be obtained through the Bucks County Planning Commission.

* * *

This folder has been prepared for Bucks County by the Corps of Engineers from data in the report "Flood Plain Information, East Branch Perkiomen Creek, Bucks County, Pennsylvania". Copies of that report and this folder are available from the Bucks County Planning Commission, Natural Resources Division, Bucks County Administration Building, Doylestown, Pennsylvania 18901, and the Pennsylvania Department of Forests and Waters, South Office Building, Harrisburg, Pennsylvania 17120.


BRANDT RD.
COWPATH RD.
COUNTY LINE RD.
STUDY LIMIT
DAM NO. 1
DAM NO. 2
GREEN HILL RD.
FLOW
HOLLOW RD.
EAST BRANCH
SIMMONS RD.
BRANCH RD.
LONLEY RD.
CAT HILL RD.
PERKIOMEN
CREEK
ROUTE 309 BY PASS
U.S.
FORREST RD.
MELVIN RD.
QUARRY RD.
MEETING HOUSE RD.
CLYMER RD.
DETWILERS RD.


ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM
360
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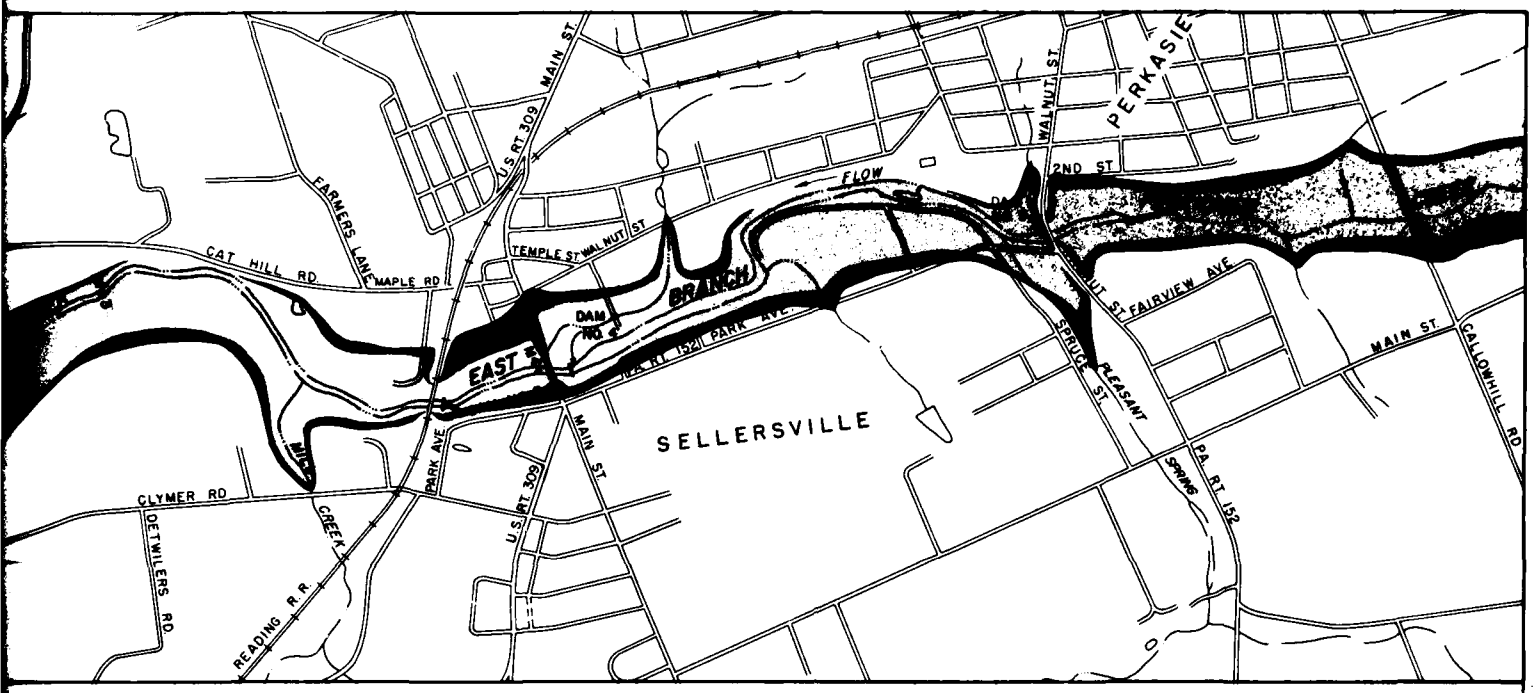
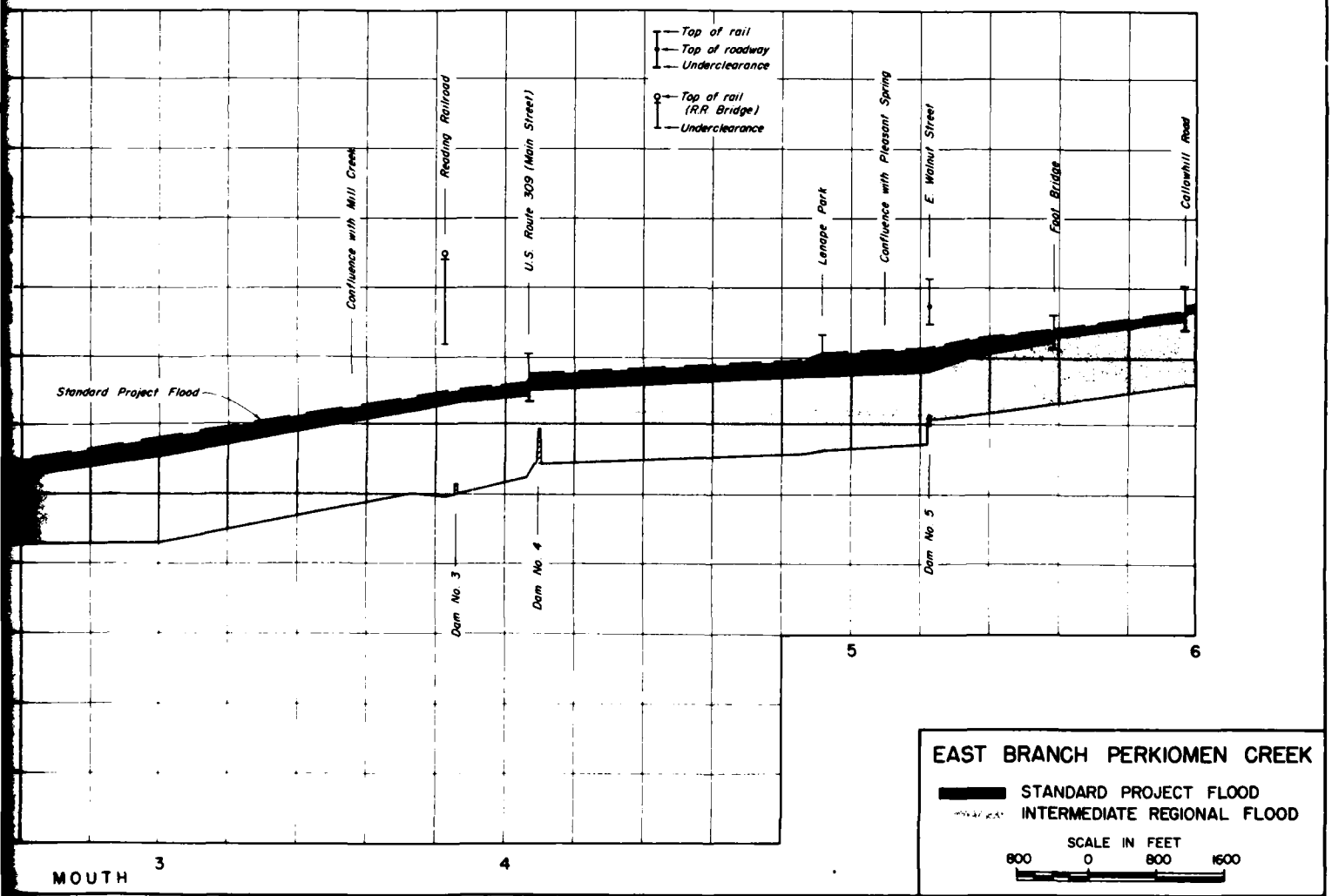
340
330
320
310
300
290
280
270
260
250
240
0
1
2
3
MILES ABOVE MOUTH
Dam No 1
Dam No 2
Cowpath Road
Countyline Road
Cat Hill Road
U.S. Route 309 (Bypass)
Standard Project Flood
Intermediate Regional Flood
Stream Bed





EAST BRANCH PERKIOMEN CREEK

STANDARD PROJECT FLOOD

INTERMEDIATE REGIONAL FLOOD

SCALE IN FEET

800 0 800 1600

FLOOD PLAIN INFORMATION

EAST BRANCH PERKIOMEN CREEK

BUCKS COUNTY PENNSYLVANIA

PREPARED FOR
BUCKS COUNTY PLANNING COMMISSION
AND
PENNSYLVANIA DEPARTMENT OF FORESTS AND WATERS
BY
CORPS OF ENGINEERS, U. S. ARMY
PHILADELPHIA DISTRICT
JANUARY 1971

CONTENTS

CONTENTS (Continued)

TABLES

PLATES

FIGURES

INTRODUCTION

This report covers the flood situation along the East Branch Perkiomen Creek starting from the dam located about 0.74 mile downstream from the Montgomery - Bucks County Line (County Line Road) and extending upstream through the Boroughs of Sellersville and Perkasie, 12.0 miles to its headwaters in Bedminster Township, Bucks County, Pennsylvania. It was prepared at the request of the Bucks County Planning Commission to aid in the solution of local flood problems and in the best use determination for flood-prone lands. The report is based upon information on rainfall runoff and historical flood heights and other technical data bearing upon the occurrence and size of floods within the study area.

Two significant phases of the local flood problem are covered in the report. The first phase covers the largest known floods that have occurred within the study area. The second phase deals with possible future floods; namely, the Intermediate Regional Flood and the Standard Project Flood. A description of these probable future floods and the method of their derivation is given on pages 34 through 36 of this report.

In analyzing problems concerned with the control of development in the flood plains of that portion of the East Branch Perkiomen Creek located within the study area and in reaching decisions on the sizes of floods to consider for this purpose, appropriate consideration should be given to the possible recurrence of floods equal to those of the past and to the Intermediate Regional and Standard Project Floods.

The report contains maps, profiles and cross sections which indicate the extent of floods which might occur in the future. These should prove helpful in planning the best use of the flood plains. From the profiles, the depth of probable future flooding due to the occurrence of either the Intermediate Regional or the Standard Project Flood at any location may be obtained. With this information, floor levels for structures may be planned high enough to avoid flood damage or, if located at lower elevations, with recognition of the chance of flooding and the hazards involved.

The report does not include plans for the solution of flood problems. Rather, it is intended to provide the basis for further study and planning on the part of local authorities in arriving at solutions to minimize vulnerability to flood damage. This might involve county or local planning programs to guide developments by controlling the type of use made of the flood plains through zoning and subdivision regulations, the construction of flood protection works, or a combination of the two approaches.

The Philadelphia District of the U. S. Army Corps of Engineers will, upon request, provide technical assistance to Federal, state and local agencies in the interpretation and use of the information contained herein and will provide other available flood data related thereto.

SUMMARY OF FLOOD SITUATION

The East Branch Perkiomen Creek is located in the southeastern corner of Pennsylvania in Bucks and Montgomery Counties. The stream flows in a southwesterly direction from its headwaters west of the community of Bedminster in Bedminster Township, Bucks County, through the Boroughs of Perkasie and Sellersville to its confluence with the main stem Perkiomen Creek just south of Schwenksville in Montgomery County. The Perkiomen then flows in a southerly direction to its confluence with Schuylkill River just above Valley Forge State Park. The reach of the East Branch included in the study area has a length of 12.0 miles from its headwaters to just downstream of the Bucks - Montgomery County Line. The principal tributaries of the East Branch within this reach are Mill Creek, Pleasant Spring Creek and Morris Run.

In the upstream reaches above the Borough of Perkasie, the stream flows through a fairly wide valley with gently rolling hills. The flood plains are rural and undeveloped with only occasional residences or farm buildings located in areas vulnerable to flooding. Through the Boroughs of Perkasie and Sellersville, the stream flows through the Lenape Municipal Park areas. Below Sellersville, the valley narrows somewhat and the flood plain areas are again predominantly rural.

Plate 1 shows the watershed area for the entire Perkiomen Creek.

While the U. S. Geological Survey (U.S.G.S.) maintains stream gaging stations on the main stem of Perkiomen Creek, there

are no gaging stations located on the East Branch. Available high water marks of past floods were obtained, residents along the stream were interviewed and newspaper files and historical documents were searched for information concerning past floods. From these investigations and from studies of possible future floods on the East Branch, the local flood situation, both past and future, has been determined.

The following paragraphs summarize the significant findings which are discussed in more detail in succeeding sections of this report:

THE GREATEST FLOODS. Two floods occurring on the East Branch Perkiomen Creek about eighteen years apart were almost equal in magnitude. The first flood occurred on August 9, 1942 and the second occurred on September 12, 1960. These were the greatest floods for which more than fragmentary information is available. The flood of August 9, 1942 reached an elevation of 301.5 feet above mean sea level datum (m.s.l.d.) at the Sellersville Sewage Treatment Plant, while the September 12, 1960 flood reached an elevation of 301.7 feet, m.s.l.d., at the same location, or 0.2 foot higher than the 1942 flood. However, further upstream in Sellersville and above Perkasie, available high water marks indicate that the 1942 flood was slightly higher than the 1960 flood. This variation is no doubt due to local stream conditions or the effects of possible debris accumulations.

* * *

OTHER LARGE FLOODS. Other large floods occurred on the East Branch on November 25, 1950; June 20, 1946; and, August 8, 1955

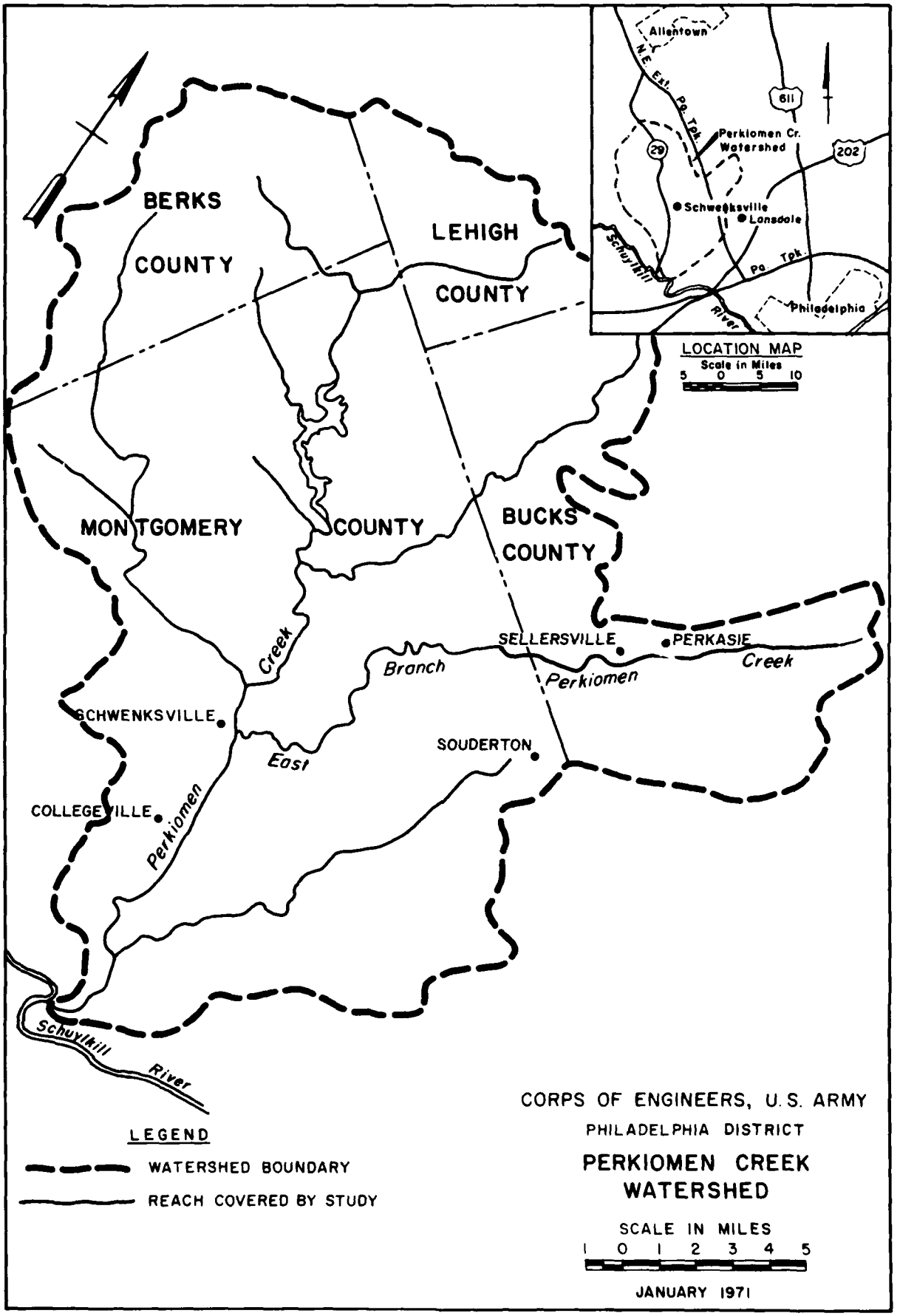

Allentown
N.E. Ext. Pa. Tpk.
611
Perkiomen Cr. Watershed
29
202
Schwenksville
Lansdale
Schuylkill
Pa. Tpk.
River
Philadelphia
LOCATION MAP
Scale in Miles
5 0 5 10
BERKS COUNTY
LEHIGH COUNTY
MONTGOMERY COUNTY
BUCKS COUNTY
SELLERSVILLE
PERKASIE
Creek
Branch
Perkiomen
Creek
SCHWENKSVILLE
East
SOUDERTON
COLLEGEVILLE
Perkiomen
Schuylkill River
LEGEND
WATERSHED BOUNDARY
REACH COVERED BY STUDY
CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT
PERKIOMEN CREEK WATERSHED
SCALE IN MILES
1 0 1 2 3 4 5
JANUARY 1971

PLATE 1

(listed in descending order of magnitude). The August 8, 1955 flood reached an elevation of 300.4 feet above mean sea level datum at the Sellersville Sewage Treatment Plant or 1.3 feet below the September 12, 1960 flood at that location.

* * *

INTERMEDIATE REGIONAL FLOOD on the East Branch Perkiomen Creek is a flood that has an average frequency of occurrence in the order of once in 100 years. It is determined from an analysis of floods on this stream and other streams in the same general area. The analysis indicates that the Intermediate Regional Flood would be about 0.7 foot higher than the flood of September 12, 1960 at the sewage treatment plant.

* * *

STANDARD PROJECT FLOOD determinations indicate that a flood could occur that would be 2.8 feet higher than the September 12, 1960 flood at the sewage treatment plant. This flood is defined on page 36 of this report.

* * *

FLOOD DAMAGES that would result from the recurrence of major known floods would be substantial particularly in the Sellersville area. More extensive damages would be caused by the Intermediate Regional and Standard Project Floods because of their wider extent, greater depths and higher velocities.

* * *

MAIN FLOOD SEASONS for this reach of the East Branch Perkiomen Creek are in the late spring and early fall. Three of the five highest known floods occurred during the months of August and September.

* * *

HAZARDOUS CONDITIONS would occur during large floods as a result of the rapidly rising streams, high velocities and deep flows.

* * *

FUTURE FLOOD HEIGHTS that would be reached if the Intermediate Regional and Standard Project Floods occurred within the study area are shown in table 1. The table gives a comparison of these flood crests at various locations and also shows the comparison of these flood crests with the August 9, 1942 flood.

* * *

TABLE 1

RELATIVE FLOOD HEIGHTS

EAST BRANCH PERKIOMEN CREEK

Flood	Location	(1) Station miles	Estimated Peak Discharge cfs	(2) Elevation feet	Above or (Below) 1942 Flood feet
August 9, 1942	Sewage Treatment Plant (Sellersville, Pa.)	3.73	Not Determined	301.5	-
Intermediate Regional			7,750	302.4	0.9
Standard Project			13,250	304.5	3.0
August 9, 1942	Nr. U.S. Rt. 309 Bridge (Sellersville, Pa.)	4.09	Not Determined	305.6	-
August 9, 1942		4.10	Not Determined	307.1	-
Intermediate Regional		4.10	6,700	305.7	(1.4)
Standard Project		4.10	12,100	308.0	0.9
August 9, 1942	Nr. Branch Road Bridge	7.53	Not Determined	328.9	-
Intermediate Regional			4,850	328.8	(0.1)
Standard Project			6,900	330.9	2.0

(1) Second dam about 0.74 mile below Bucks - Montgomery County Line is assumed to be zero.

(2) Refers to feet above mean sea level datum, Sandy Hook, N. J., 1929 Adjustment.

GENERAL CONDITIONS AND PAST FLOODS

Except for the Boroughs of Sellersville and Perkasie, those portions of Bucks County, Pennsylvania, adjacent to the East Branch Perkiomen Creek within the study area are predominantly rural. The flood plains are generally used for agricultural purposes or are lightly wooded. A considerable portion of the flood plain areas located within the two boroughs has been developed for municipal park purposes. The remaining areas are utilized for residential, commercial and industrial purposes. Many of these facilities have suffered damage from past floods and a still larger number are vulnerable to damage from future floods of greater magnitude such as the Standard Project Flood.

There are six dams located on the East Branch within the study limits. All of them are relatively small and are either privately or municipally owned.

Dam No. 1 is located in Montgomery County, Pennsylvania, at the downstream limit of the study area. The dam is located on a bend in the stream and is constructed of large rock slabs with some concrete mortar. The dam is about 170 feet wide and approximately five feet high. The ponded area extends about 800 feet above the dam and has an average width of about 75 feet. The dam is in relatively poor condition even though it was repaired several years ago by the local residents for aesthetic reasons. It was originally built to serve a grist mill formerly located below the dam known as School (pronounced "Shawl") Mill built about 1744. The dam is now privately owned and is located about 0.74 mile below the Montgomery - Bucks County Line (County Line Road).

Dam No. 2 is also located in Montgomery County about 0.28 mile above Dam No. 1 and 0.46 mile below the Montgomery-Bucks County Line. It is also an old dam of rock construction with some concrete mortar and is in poor condition. The dam has a width of about 200 feet and varies from 3.5 to 4 feet in height. A shallow ponded area extends about 500 feet above the dam and has an average width of about 100 feet. The center and left bank sections of the dam have been ruptured to a considerable extent. The dam was built in the late 1920's to serve a YMCA summer camp for recreational purposes. It is now privately owned.

Dam No. 3 is owned by the Borough of Sellersville and is located about 125 feet upstream of the Reading Railroad bridge (Mile 3.86). It is an old, low, loose rock and waste concrete slab structure about 2 feet high and 75 feet long. It ponds shallow water about 50 feet wide up to the old U. S. Route 309 (Main Street) bridge in Sellersville.

Dam No. 4 is located in Lenape Park in the Borough of Sellersville about 200 feet above the Main Street (old U. S. Route 309) bridge. The dam is a fairly-modern concrete structure about 80 feet wide and 5 feet high with stone retaining walls on the downstream sides. The ponded area is about 100 feet wide and extends upstream through the Lenape Park area a distance of approximately 900 feet. The dam, along with Lenape Park, was built as a Works Progress Administration (WPA) project in 1936. It is used for recreational purposes - boating and ice skating only. The site of the dam was formerly occupied by an old mill dam built several hundred years ago. The old mill structure, now part of a furniture store, still stands on the left bank adjacent to the present dam.

Dam No. 5 is a concrete and stone structure located in the Borough of Perkasie in the park area on the downstream side of the East Walnut Street bridge (Pa. Route 152). It is owned by the Borough and, in reality, is not a dam but rather a protective covering for pipelines and other utilities which cross the East Branch at this location. The structure is about 140 feet wide and approximately 5 feet high on the downstream side.

Dam No. 6, located near the headwaters of the East Branch about 100 feet above the Sweet Briar Road bridge (Mile 11.67), is a small, privately-owned concrete structure. The dam is about 25 feet long and 4 feet high with stone retaining walls on the downstream sides. There is a small shallow pond above the dam about 20 feet wide and 200 feet long. The remains of an old concrete and stone dam are located about 1.5 feet below the present structure.

Each of the six dams has a very limited storage capacity and, therefore, the capability of the dams to reduce flood stages is negligible. Photographs of some of the dams are shown in figure 1.

SETTLEMENT

Except for about 0.74 stream mile extending southward into Montgomery County at the lower limit of the study area, the entire reach of the East Branch Perkiomen Creek included in this report is located in Bucks County, Pennsylvania.

There were three original counties in William Penn's Colony: Philadelphia, Bucks and Chester. By the end of the seventeenth century, the whole of Delaware County and little more than half of

Figure 1.--DAMS ACROSS EAST BRANCH PERKIOMEN CREEK

Top view is Dam No. 2 located below the Montgomery - Bucks County Line. Bottom view is Dam No. 4 located in Lenape Park at Sellersville, Pa.

Bucks County was sparsely settled. Negotiations with the Indians held off the settlement of upper Bucks County until the late eighteenth century. Early settlers in Bucks County were generally followers of William Penn and the Society of Friends. They were followed by the Welsh, Scotch Irish and later the Germans who followed the Perkiomen and settled widely in central and upper Bucks County in 1750.

The Bucks County Court was established at Falls, the first settlement, then shifted to Bristol in 1705, northward to Newtown in 1724, and finally to Doylestown in 1817.

Within the study limits, the East Branch Perkiomen Creek flows through the Townships of West Rock Hill, East Rock Hill, Hilltown and Bedminster and the Boroughs of Sellersville and Perkasie. This area comprises that portion of Bucks County commonly known as Pennridge.

The Borough of Perkasie was incorporated in 1876 from south western East Rock Hill Township. The name has been variously spelled, a common form being Perkasy. The origin of the name was probably Indian, a corruption of the Lenape word Pockskasing, meaning "where hickory nuts were cracked". Perkasie Creek or Indian Creek (now the East Branch Perkiomen Creek) passed through the town and shellbark hickory trees were abundant along its banks. Perkasie started around a little country store in 1870. It grew rapidly and became the fastest growing community in Bucks County. The post office was established on July 26, 1871 about the same time that the railroad station was built. The next census following its incorporation showed Perkasie to have a population of 300. Buildings were erected rapidly on newly-opened streets and by 1895 the population had

increased to 1,500. About 1897, Bridgetown, later called South Perkasie, was annexed and Perkasie then became the fourth largest borough in Bucks County.

The Borough of Sellersville, formerly a part of southeastern West Rock Hill Township, was incorporated in 1874. Wambolds Mill and Tannery was located on Branch Creek (the name still given by many to the East Branch Perkiomen Creek) as early as 1750 and Dustines Mill, just below, was built the same year. In 1790, Samuel Sellers purchased a tavern lot and four acres, thereafter known as Sellers Tavern, which also became the name of the town. The first postmaster was appointed August 28, 1820. The town's name was changed to Sellersville on October 17, 1886. The town has long been noted for its industries. It was a cigar-making center before 1860 and a coach-making plant flourished during the same period. Flour and grist mills were opened in or near the town. Today its gage works, founded in 1904, are nationally famous and carillons and bells manufactured in the town are shipped all over the world.

Bucks County as a whole was a rustic county until recent times. The distribution of its natural resources influence industrial growth. The county had highly arable land and rich clay and gravel deposits. Today, the latter support the region's largest construction materials company which has existed for a century and a half. The county's population has increased rapidly in recent years. In 1800, the population was 27,496; 56,091 in 1850; 71,190 in 1900; 144,620 in 1950; and, 308,567 in 1960. The 1960 census figures and the projected population estimates for the townships and boroughs in which the study area is located are shown in table 2.

TABLE 2

PROJECTED POPULATION [1/]

Municipality	Year 1960	1970	1975	1990	2010
West Rock Hill Township	2,484	3,510	4,300	7,250	12,050
East Rock Hill Township	1,990	2,850	3,400	5,400	8,550
Bedminster Township	2,740	3,450	3,880	5,450	7,950
Hilltown Township	5,549	7,850	9,150	13,600	20,300
Perkasie Borough	4,650	5,250	5,640	7,160	9,500
Sellersville Borough	2,497	2,860	3,125	3,800	4,275
Bucks County	308,567	445,103	519,341	730,497	992,035

FLOOD DAMAGE PREVENTION MEASURES

There are no existing flood control or related measures, nor are there any flood plain regulations within the study area. However, throughout large portions of the Boroughs of Sellersville and Perkasie, the stream flows through municipally-owned park areas which have contained past major known floods and thereby reduced possible flood damages.

FLOOD WARNING AND FORECASTING SERVICES

No specific flood warning or forecasting services are presently available in the study area. Inhabitants depend entirely on the usual warnings issued through radio, television and the local press media.

1/ Prepared by Justin & Courtney, Consulting Engineers, for the Bucks County Planning Commission.

THE STREAM AND ITS VALLEY

The East Branch, with a total drainage area of about 61 square miles, is a principal tributary of Perkiomen Creek. Perkiomen Creek is a tributary of Schuylkill River and joins that river above Valley Forge in Montgomery County, Pennsylvania. The headwaters of the East Branch are located in Bedminster Township, Bucks County, about 400 feet above mean sea level datum. The stream flows in a southwesterly direction about 23.5 miles to unite with the main stem of Perkiomen Creek just southeast of the municipality of Schwenksville in Montgomery County.

Within the study area, the East Branch flows 12.0 miles through Bucks County from its headwaters to the old mill dam located about 0.74 mile below the Montgomery - Bucks County Line (County Line Road). The stream slope through the study area totals 144 feet or an average fall of 12 feet per mile. The extreme upper portion of the stream bed drops swiftly, as much as 49 feet per mile. The stream gradient becomes more gentle above the Borough of Perkasie and averages about 7.6 feet per mile through the Perkasie - Sellersville area and below. It increases slightly in the first two mile reach of the study area to a slope of 9.5 feet per mile.

The stream flows through valleys formed by gently rolling hills in the upstream areas and flood plains average from 200 to 600 feet in width. Through the Perkasie - Sellersville areas, the flood plains average 800 to 1,600 feet in width with much of the flood plain area devoted to park use. In the downstream reaches, the flood plains narrow to 200 to 500 feet in width and the side slopes are steeper.

With the exception of the reach through Sellersville and Perkasie, the flood plains on both sides of the East Branch are predominantly rural and sometimes wooded. Drainage areas for Perkiomen Creek and its East Branch are shown in table 3.

DEVELOPMENTS IN THE FLOOD PLAIN

Plates 5 through 9 show the areas that would be flooded by the Intermediate Regional and Standard Project Floods. Above and below the Boroughs of Perkasie and Sellersville, there are scattered residential and commercial developments located within these areas. Although a large portion of the flood plain area lying within the two boroughs has been developed for municipal park use (Lenape Park), there are residential, commercial and industrial developments in the remaining areas with the greatest concentration being in the vicinity of old U. S. Route 309 (Main Street) in Sellersville. Some of these facilities have suffered damage from past floods and a still greater number are vulnerable to flooding by the potentially larger floods of the future.

BRIDGES ACROSS THE STREAM

There are sixteen highway bridges, one railroad bridge, two foot bridges and two highway culverts on the East Branch Perkiomen Creek in the 12 mile study area. Table 4 lists pertinent elevations for these structures and shows their relation to the Intermediate Regional and Standard Project Floods.

The Cowpath Road bridge at Mile 0.47 and the Main Street (old U. S. Route 309) bridge at Mile 4.07 are both three-lane concrete

TABLE 3

WATERSHED DRAINAGE AREAS

PERKIOMEN CREEK AND EAST BRANCH

Location	Drainage Area Tributary Sq. Mi.	Drainage Area Total Sq. Mi.
Perkiomen Creek at Spring Mount (Abv. E. Br.)	-	150.0
East Branch Perkiomen Creek		
Above Morris Run	-	6.4
Morris Run	7.2	-
Below Morris Run	-	13.6
Callowhill Rd. (Perkasie Borough Line)	-	16.3
Above Pleasant Spring	-	17.9
Pleasant Spring Creek	9.0	-
Below Pleasant Spring Creek	-	26.9
Main Street Sellersville (Old U. S. Rt. 309)	-	28.8
Above Mill Creek	-	29.2
Mill Creek	5.0	-
Below Mill Creek	-	34.2
Montgomery - Bucks County Line	-	38.2
Second Dam below County Line (Study Limit)	-	39.0
Vaughn Run	1.4	-
Indian Creek	6.0	-
Schwenksville	-	61.0
Swamp Creek (Perkiomen Creek Tributary)	55.4	-
Mine Run (Perkiomen Creek Tributary)	4.1	-
Perkiomen Creek at Graterford	-	278.0
Skippack Creek	55.8	-
Perkiomen Creek at Mouth (Schuylkill River)	-	362.0

TABLE 4

BRIDGES ACROSS EAST BRANCH PERKIOMEN CREEK

Station* miles	Identification	Stream Bed Elev. feet	Floor Elev. feet	Inter-mediate Regional Flood Crest Elev. feet	Standard Project Flood Crest Elev. feet	Under-clear-ance Elev. feet	Underclearance Elev. Above or (Below) Intermediate Regional Flood Elev. feet	Standard Project Flood Elev. feet
.47	Cowpath Rd.	262.5	278.8	272.7	275.6	276.2	3.5	0.6
.74	County Line Rd.	264.2	282.0	276.2	279.1	280.1	3.9	1.0
1.78	Cat Hill Rd.	275.2	289.7	286.6	291.2	288.1	1.5	(3.1)
2.56	U.S. Rt. 309 By-pass	283.0	301.1	292.8	294.9	297.5	4.7	2.6
3.83	Reading Railroad	289.9	324.9	303.5	305.4	314.1	10.6	8.7
4.07	Main Street (Old U.S. Rt. 309)	292.8	306.9	305.6	307.9	303.7	(1.9)	(4.2)
4.92	Lenape Park (Foot Bridge	296.3	309.9	307.6	310.9	309.2	1.6	(1.7)
5.23	E. Walnut St.	301.4	317.5	308.2	311.7	314.0	5.8	2.3
5.59	Foot Bridge	303.3	313.1	313.4	314.4	311.3	(2.1)	(3.1)
5.97	Callowhill Rd.	306.1	316.9	316.8	317.7	314.1	(2.7)	(3.6)
6.89	Moods Bridge (Blooming Glen Rd.)	313.7	326.7	324.2	326.0	323.6	(0.6)	(2.4)
7.42	Branch Rd.	314.9	330.3	328.0	330.3	326.3	(1.7)	(4.0)
7.94	Schwenk Mill Rd.	321.8	334.0	333.5	334.3	331.4	(2.1)	(2.9)
8.94	Doylestown Rd. (Pa. Rt. 313)	330.1	341.7	342.2	343.1	338.7	(3.5)	(4.4)

TABLE 4 (Continued)

BRIDGES ACROSS EAST BRANCH PERKIOMEN CREEK

Station* miles	Identification	Stream Bed Elev. feet	Floor Elev. feet	Intermediate Regional Flood Crest Elev. feet	Standard Project Flood Crest Elev. feet	Underclearance Elev. feet	Underclearance Elev. Above or (Below) Intermediate Regional Flood Elev. feet	Underclearance Elev. Above or (Below) Standard Project Flood Elev. feet
9.66	Bucks Rd.	338.4	347.7	349.3	350.6	345.6	(3.7)	(5.0)
10.38	Elephant - Dublin Rd.	351.0	359.8	360.6	361.7	358.0	(2.6)	(3.7)
10.93	Spruce Lane	362.1	370.2	371.2	371.7	368.1	(3.1)	(3.6)
10.97	Private Rd.	363.7	370.5	371.5	371.9	369.0	(2.5)	(2.9)
11.53	Private Rd.	383.7	387.6	389.4	390.6	385.7	(3.7)	(4.9)
11.67	Sweet Briar Rd.	390.3	395.4	395.6	396.1	394.6	(1.0)	(1.5)
11.93	Slotter Rd.	408.2	411.6	414.0	414.5	411.3	(2.7)	(3.2)

* Second dam below Montgomery - Bucks County Line (0.74 mile below) is assumed as station zero. Elevations are referenced to Mean Sea Level Datum.

structures. The former is a two-span and the latter, a three-span bridge. The Main Street bridge roadway would be flooded by the Standard Project Flood.

The County Line Road bridge at Mile 0.74 is a two-lane, four-span, concrete structure with a floor elevation and underclearance well above the Standard Project Flood.

The bridges at Cat Hill Road, Mile 1.78; Schwenk Mill Road, Mile 7.94; Bucks Road, Mile 9.66; and, Elephant-Dublin Road, Mile 10.38, are steel truss bridges with stone piers and abutments and wooden decks. The Schwenk Mill Road and Bucks Road bridges are two-lane, single-span structures. The Cat Hill Road bridge is a two-lane, two-span structure, while the Elephant-Dublin Road bridge is a one-lane, single-span structure. Only the Bucks Road and Elephant-Dublin Road bridges would be inundated by the Intermediate Regional Flood. All four bridges would be flooded by the Standard Project Flood.

The U. S. Route 309 By-pass bridge at Mile 2.56 is a modern, four-lane, three-span, all concrete structure. The floor elevation is well above the Standard Project Flood.

The Reading Company railroad bridge at Mile 3.83 is a double-track, seven-span, concrete arch bridge with stone and concrete wing walls. The top of rail elevation is 19.5 feet above the Standard Project Flood.

The twin foot bridges located in Lenape Park in the Borough of Perkasie, Mile 4.92, are suspension-type, single-cable bridges. The abutments, anchor blocks and towers are of concrete construction.

The superstructures are of timber construction with wood plank walkways. The floors of both bridges would be inundated by the Standard Project Flood.

The East Walnut Street bridge in Perkasie, Mile 5.23, is a two-lane, three-span, concrete arch structure. It was originally known as Branch bridge built in 1867 and rebuilt in 1907. Its roadway elevation is above the Standard Project Flood.

Another foot bridge is located at Mile 5.59 in Perkasie. It is a two-span structure with concrete abutments and pier, I-beam structure, timber railings and wooden plank floor.

The Callowhill Road bridge at Mile 5.97 is a two-lane, three-span, all concrete structure built in 1940. The roadway would be inundated by the Standard Project Flood to a depth of 0.8 foot.

Moods bridge (Blooming Glen Road) at Mile 6.89 is a two-lane, single-span, timber covered bridge with stone abutments and approach ramp retaining walls built in 1874. The floor surface is about 0.7 foot above the Standard Project Flood.

The Branch Road bridge at Mile 7.42 is a two-lane, single-span, steel-truss bridge with concrete abutments, retaining walls and floor slab. The Standard Project Flood would just reach the bridge floor.

The Doylestown Road (Pa. Rt. 313) bridge at Mile 8.94 and the Spruce Lane bridge at Mile 10.93 are both two-lane, single-span

all concrete structures. The roadway of both bridges would be flooded by the Intermediate Regional Flood.

The single-lane private road bridge at Mile 10.97 is a low, timber structure on stone abutments. The bridge has no guard rails. It would be flooded to a depth of one foot by the Intermediate Regional Flood.

The Sweet Briar Road bridge at Mile 11.67 is a two-lane, single-span, concrete slab bridge with stone abutments and iron pipe railings. The Intermediate Regional Flood would just cover the roadway.

The two culverts are located under a private road at Mile 11.53 and under Slotter Road at Mile 11.93. The first consists of twin 24" diameter iron culvert pipes with low, loose rock headwalls. The second is a 36" diameter corrugated metal pipe without headwalls.

Figures 2, 3 and 4 show pictures of some of the bridges.

OBSTRUCTIONS TO FLOOD FLOW

With the exception of the bridges, there are no significant obstructions to flood flows in the study area. However, the relatively low head losses attributable to the bridge restrictions are based on the assumption that there would be no accumulation of debris to clog these openings. Such clogging would create considerably more extensive flooding upstream than would otherwise be

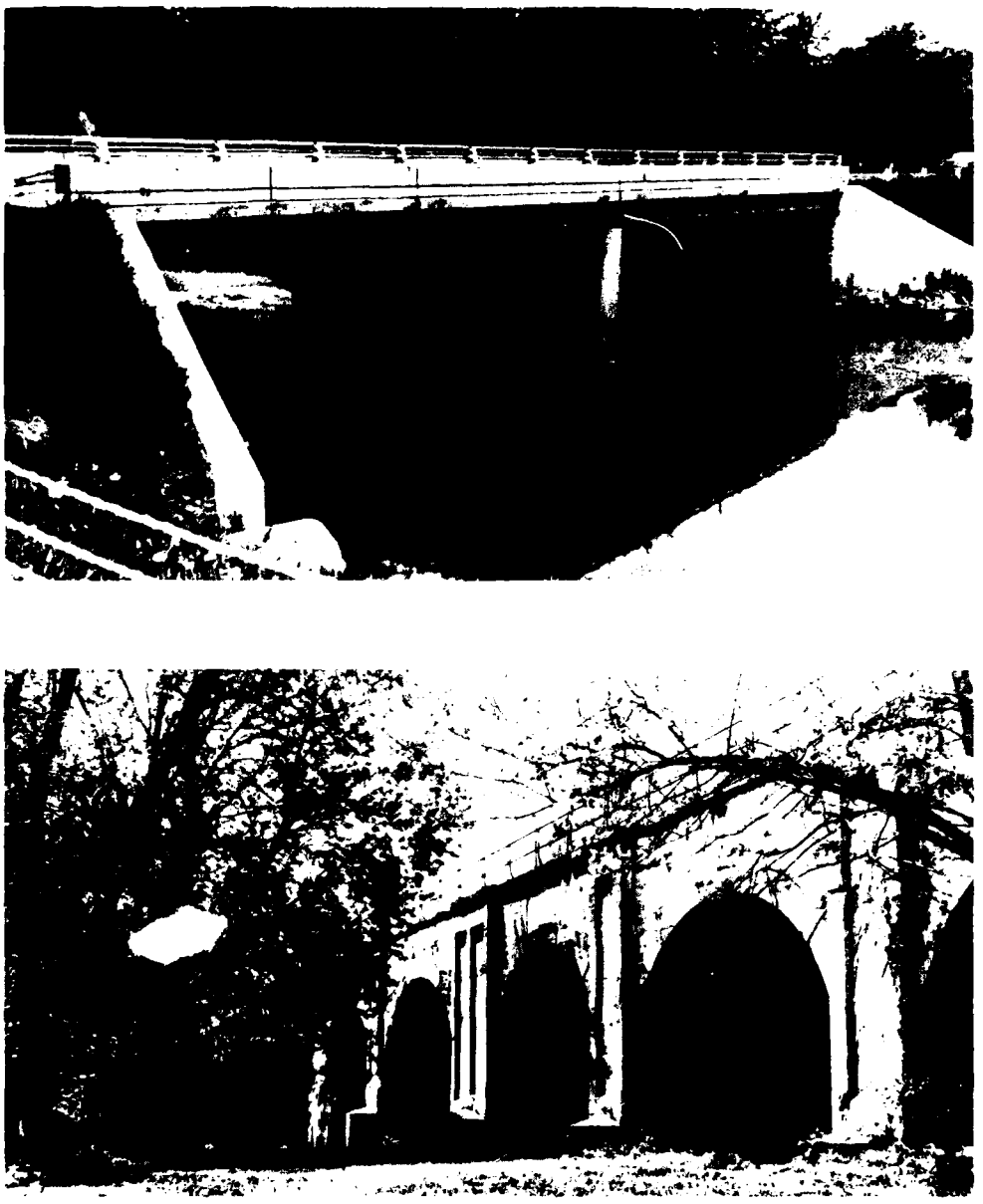


Figure 2.--BRIDGES ACROSS EAST BRANCH PERKIOMEN CREEK

Top view is the downstream side of Cowpath Road bridge at Mile 0.47. Bottom view is the downstream side of the multi-arch Reading Railroad bridge at Mile 3.83.

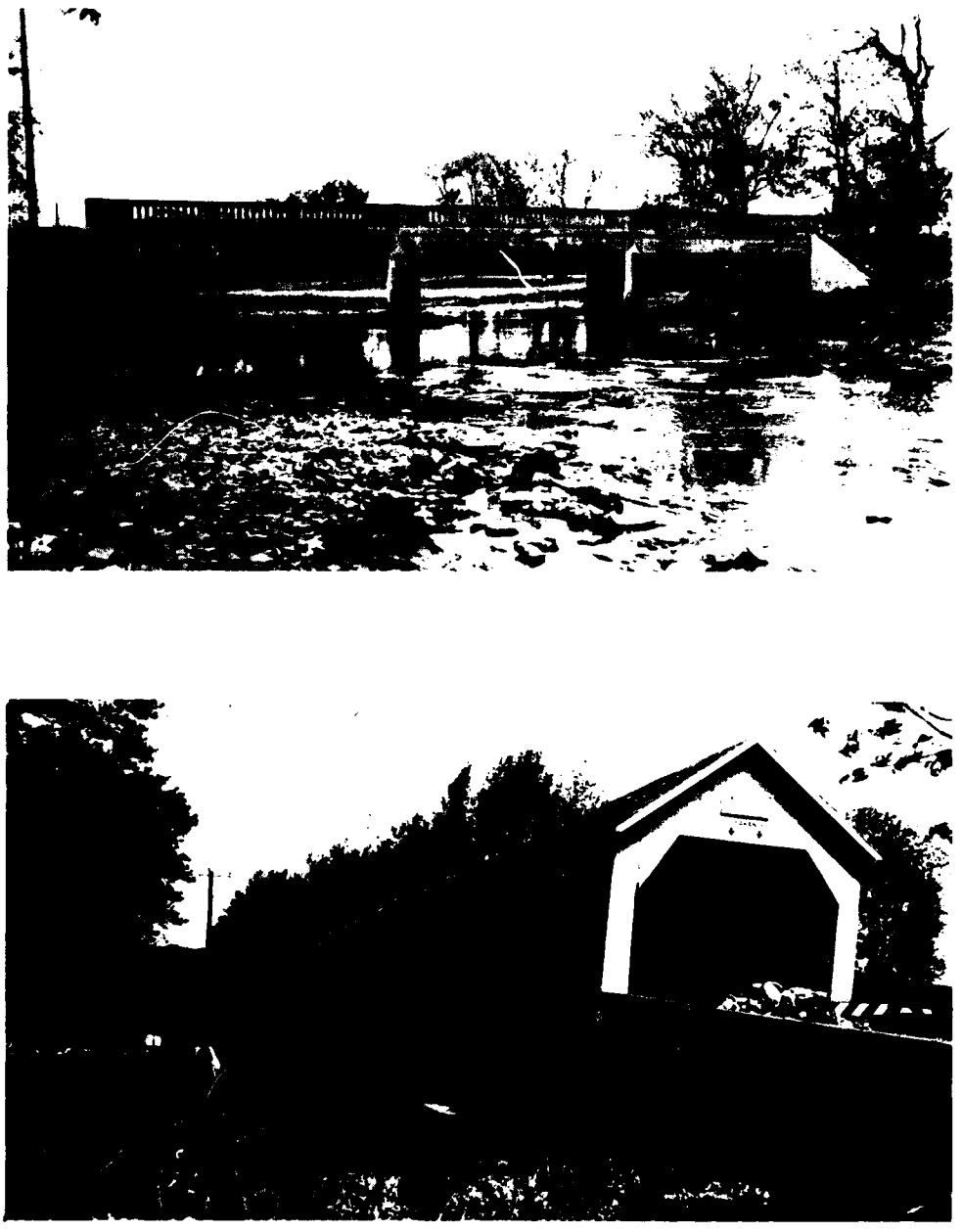


Figure 3.--BRIDGES ACROSS EAST BRANCH PERKIOMEN CREEK

Top view is the upstream side of Main Street bridge in Sellersville. Bottom view is Moods covered bridge at Mile 6.89.

Figure 4.--BRIDGES ACROSS EAST BRANCH PERKIOMEN CREEK

Top view is the downstream side of the Schwenk Mill Road bridge at Mile 7.94. Bottom view is the upstream side of Doylestown Road (Pa. Rt. 313) bridge at Mile 8.94.

anticipated. The effects of the six dams in the study area are negligible during large floods and are not considered obstructions to flood flows. Shortly after the large flood of September 12, 1960, the portion of the stream channel from the Old U. S. Rt. 309 (Main Street) bridge in Sellersville downstream to the dam located just above the Reading Railroad bridge was deepened, widened, and straightened. Since then, there has been an appreciable lowering of flood levels for all but the major floods upstream of the Main Street bridge.

FLOOD SITUATION

FLOOD RECORDS

The only stream gage in the Perkiomen Basin with records of sufficient length for frequency analysis is located on Perkiomen Creek at Graterford, Montgomery County, below the confluence with the East Branch. The U.S.G.S. gage at that location has a length of record from June 1914 to the present time. The drainage area at the gage is 279 square miles. The maximum flood of record prior to September 1967 had a discharge of 39,900 cubic feet per second. The U.S.G.S. also maintains a stream gage on Skippack Creek, a tributary of the Perkiomen, near Collegeville, Pennsylvania. However, this gage record only covers the period from April 1966 to the present time. The drainage area at this gage is 53.7 square miles and the maximum recorded flood had a discharge of 4,620 cubic feet per second. There are no stream gages located on the East Branch of Perkiomen Creek.

To supplement the record of the gaging stations, local residents were interviewed for information on dates and heights of floods. Newspaper files, historical documents were searched and the elevations of known high water marks were obtained. These records and investigations developed a knowledge of floods on the East Branch Perkiomen Creek covering the past 55 years.

FLOOD STAGES AND DISCHARGES

Crest stages and discharges for the known floods exceeding the bankfull stage of 11 feet at the gaging station on Perkiomen Creek at Graterford, Pennsylvania, are shown in table 5. Table 6 lists the ten highest floods in their order of magnitude. Table 7 lists the maximum known flood discharges on streams in the vicinity of the study area.

TABLE 5

PERKIOMEN CREEK AT GRATERFORD, PENNSYLVANIA
FLOOD CREST ELEVATIONS ABOVE BANKFULL STAGE

(Drainage Area = 279 square miles. Datum of Gage = 112.66 feet above mean sea level datum, USC & GS 1929 General Adjustment datum.)

Date	Gage Height		Discharge
	Stage feet	Elevation * ft. abv. m.s.l.d.	cfs
January 7, 1915	14.33	123.70	19,800
January 13, 1915	13.98	123.35	18,900
February 1, 1915	14.83	124.20	21,300
August 4, 1915	16.04	125.41	24,900
February 15, 1918	12.70	122.07	15,600

TABLE 5 (Continued)

Date	Gage Height Stage feet	Gage Height Elevation * ft. abv. m.s.l.d.	Discharge cfs
February 20, 1918	12.70	122.07	15,600
July 21, 1919	13.50	122.87	17,400
July 14, 1928	13.36	126.02	21,200
February 26, 1929	11.22	123.88	14,700
October 2, 1929	11.62	124.28	15,800
August 23, 1933	16.65	129.31	34,600
September 30, 1934	12.34	125.00	19,100
July 9, 1935	18.26	130.92	39,900
September 4, 1935	11.55	124.21	15,800
January 3, 1936	11.40	124.06	16,400
March 15, 1940	12.71	125.37	19,100
May 20, 1940	13.28	125.94	22,100
August 9, 1942	15.50	128.16	30,200
June 18, 1943	11.60	124.28	17,000
November 9, 1943	11.43	124.09	16,400
January 1, 1945	11.94	124.60	17,900
June 2, 1946	16.23	128.89	31,700
July 23, 1946	12.18	124.84	18,000
December 30, 1948	11.85	124.51	17,800
November 25, 1950	14.60	127.26	26,100
April 28, 1952	11.21	123.87	16,100
July 10, 1952	11.15	123.81	16,100
November 22, 1952	13.36	126.02	22,400
December 11, 1952	12.49	125.15	19,700
January 24, 1953	11.31	123.97	16,400
August 13, 1955	14.26	126.92	24,200
August 19, 1955	14.08	126.74	23,600
October 15, 1955	12.72	125.38	19,100
February 28, 1958	11.23	123.89	14,700
September 12, 1960	14.55	127.21	25,400

TABLE 5 (Continued)

Date	Gage Height Stage feet	Gage Height Elevation * ft. abv. m.s.l.d.	Discharge cfs
February 8, 1965	11.11	123.77	14,500
March 7, 1967	11.86	124.52	16,600
May 31, 1968	11.75	124.41	16,300
July 29, 1969	11.17	123.83	14,600

* Prior to September 14, 1927, the gage was located 1,650 feet downstream of its present site. The datum was 3.29 feet lower, or elevation 109.37.

TABLE 6

TEN HIGHEST KNOWN FLOODS IN ORDER OF MAGNITUDE

PERKIOMEN CREEK AT GRATERFORD, PENNSYLVANIA

Order No.	Date of Crest	Gage Height Stage feet	Gage Height Elevation ft. abv. m.s.l.d.	Est. Peak Discharge cfs
1	July 9, 1935	18.26	130.92	39,900
2	August 23, 1933	16.65	129.31	34,600
3	June 2, 1946	16.23	128.89	31,700
4	August 9, 1942	15.50	128.16	30,200
5	November 25, 1950	14.60	127.26	26,100
6	September 12, 1960	14.55	127.21	25,400
7	August 4, 1915	16.04	125.41	24,900
8	August 13, 1955	14.26	126.92	24,200
9	August 19, 1955	14.08	126.74	23,600
10	November 22, 1952	13.36	126.02	22,400

TABLE 7

MAXIMUM KNOWN FLOOD DISCHARGES ON

STREAMS IN THE VICINITY OF SELLERSVILLE, PENNSYLVANIA

Stream	Location	Drainage Area sq. mi.	Date	Peak Discharge Amount cfs	Peak Discharge Per Sq. Mi. cfs
Raritan River	Manville, N. J.	490.0	September 22, 1938	36,100	75
Conestoga Creek	Lancaster, Pa.	324.0	August 24, 1933	22,800	70
Brandywine Creek	Chadds Ford, Pa.	287.0	March 5, 1920	17,200	60
Perkiomen Creek	Graterford, Pa.	279.0	July 9, 1935	39,900	145
Tulpehocken Creek	Reading, Pa.	211.0	February 8, 1965	8,330	40
Neshaminy Creek	Langhorne, Pa.	210.0	August 19, 1955	49,300	235
Octoraro Creek	Rising Sun, Md.	193.0	June 1884	60,000	310
N. Br. Raritan River	Raritan, N. J.	190.0	August 19, 1955	20,700	110
S. Br. Raritan River	Stanton, N. J.	147.0	August 19, 1955	18,000	120
Tohickon Creek	Pipersville, Pa.	97.4	August 18, 1955	16,000	165
E. Br. Brandywine Ck.	Downingtown, Pa.	81.6	August 9, 1942	11,900	145
Jordan Creek	Allentown, Pa.	75.8	August 19, 1955	9,520	125
Chester Creek	Chester, Pa.	61.1	November 25, 1950	14,400	235
Red Clay Creek	Wooddale, Del.	47.0	September 12, 1960	6,000	130
Monocacy Creek	Bethlehem, Pa.	44.5	February 28, 1958	2,340	55
Ridley Creek	Moylan, Pa.	31.8	November 25, 1950	5,720	180
Neshanic Creek	Reaville, N. J.	25.7	July 18, 1945	10,300	400
Shellpot Creek	Wilmington, Del.	7.5	August 27, 1967	4,650	620
Mantua Creek	Pitman, N. J.	6.8	September 1, 1940	4,200	620

FLOOD OCCURRENCES

Table 5 indicates that the bankfull stage of 11 feet at the Graterford gaging station on Perkiomen Creek was exceeded 39 times during the 55-year period of record.

DURATION AND RATE OF RISE

Stages can rise from normal flow to extreme flood peaks in a relatively short period of time. During the flood of August 9, 1942, the Perkiomen Creek in the Graterford area had a maximum rate of rise of 4.1 feet per hour and the stream remained out of banks for 10.5 hours. Plate 2 shows the discharge hydrograph for Perkiomen Creek at the Graterford gage for the August 9, 1942 and the July 9, 1935 floods.

VELOCITIES

During large floods on the East Branch Perkiomen Creek, velocities will range up to 7.0 feet per second in the channel and up to 2.8 feet per second in some overbank sections. Considerably higher velocities could be expected at bridges or other constrictions in the stream.

FLOODED AREAS, FLOOD PROFILES AND CROSS SECTIONS

Plates 5 through 9 show the approximate areas along the East Branch Perkiomen Creek that would be inundated by the Intermediate Regional and Standard Project Floods. The actual limits of these overflow areas may vary somewhat from those shown on the maps because the 10-foot contour interval and scale of the maps do not permit precise plotting of the flooded area boundaries.

High water profiles indicating the Intermediate Regional and Standard Project Floods are shown on plates 10 and 11 and their derivation is discussed more fully in a succeeding portions of this report.

Plate 12 shows cross sections that are typical of the total of 27 sections obtained along the East Branch Perkiomen Creek in the study area. The elevation and extent of overflow of the Intermediate Regional and Standard Project Floods are indicated on these cross sections. The locations of all sections are shown on plates 10 and 11.

FLOOD DESCRIPTIONS

Following are descriptions of known large floods that have occurred on the East Branch Perkiomen Creek:

AUGUST 9, 1942 AND SEPTEMBER 12, 1960

The floods that occurred on the East Branch on the above dates are the largest for which more than fragmentary information is available. Known high water marks indicate that the two floods were about equal in magnitude. The 1942 flood was slightly higher than the 1960 flood in the reaches through Sellersville and above. In the lower reaches of the study area, the 1960 flood was higher. At the sewage disposal plant below Sellersville, the September 1960 flood reached an elevation of 301.7 feet, m.s.l.d., and the August 1942 flood, an elevation of 301.5 feet, m.s.l.d. The August 1942 flood was the fourth largest flood recorded at the Graterford gage on Perkiomen Creek. The heavy precipitation that occurred on August 8th and 9th was fairly widespread and resulted in major flooding on other streams in the general area of Perkiomen Creek. It was the second

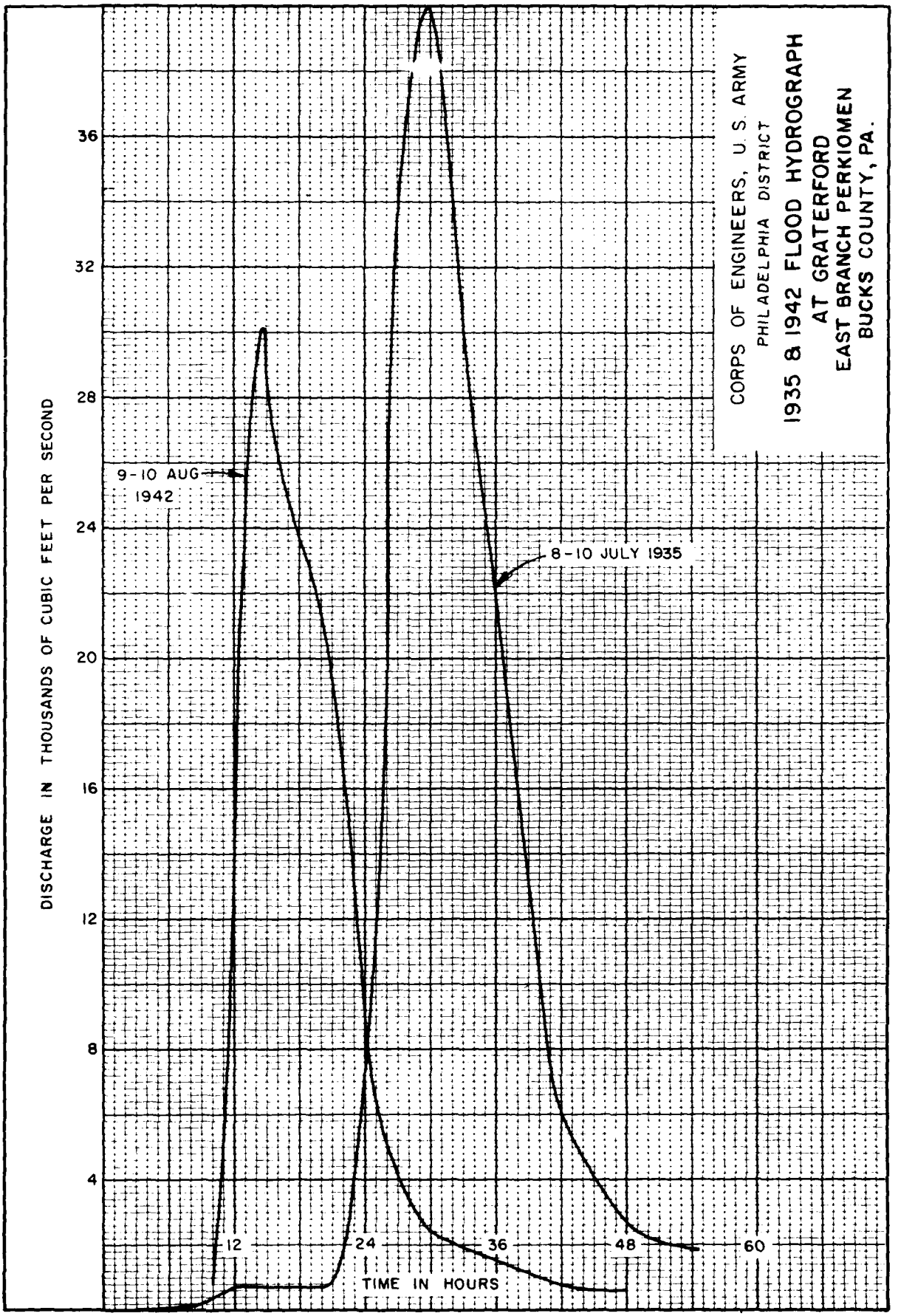

CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT
1935 & 1942 FLOOD HYDROGRAPH
AT GRATERFORD
EAST BRANCH PERKIOMEN
BUCKS COUNTY, PA.
DISCHARGE IN THOUSANDS OF CUBIC FEET PER SECOND
4
8
12
16
20
24
28
32
36
9-10 AUG 1942
8-10 JULY 1935
12
24
36
48
60
TIME IN HOURS

PLATE 2

largest flood recorded for Brandywine Creek at the Chadds Ford gage in Chester County, Pennsylvania, and the highest flood on the East Branch Brandywine Creek at Downingtown, Pennsylvania. Damage resulting from these two floods was extensive throughout the study area. Figures 5 and 6 show photographs of the August 1942 flood in the Sellersville area.

OTHER LARGE FLOODS

JULY 9, 1935

The July 9, 1935 flood is the largest recorded flood on Perkiomen Creek at the Graterford gaging station. It had a peak discharge of 39,900 cubic feet per second. The crest rose 15.6 feet in 10 hours and the stream remained out of banks for over 13 hours. The flood was the result of unusually heavy rainfall concentrated over the Perkiomen area. This flood caused extensive damage in developed areas.

AUGUST 23, 1933 AND JUNE 2, 1946

Large floods were recorded on Perkiomen Creek at the Graterford gage on each of the above dates. The two floods were similar in magnitude with the 1933 flood reaching a stage of 16.65 feet and the 1946 flood, a stage of 16.23 feet at the gage.

FUTURE FLOODS

This section of the report deals with the Intermediate Regional Flood and the Standard Project Flood on the East Branch Perkiomen Creek and some of the hazards of great floods. The Standard Project

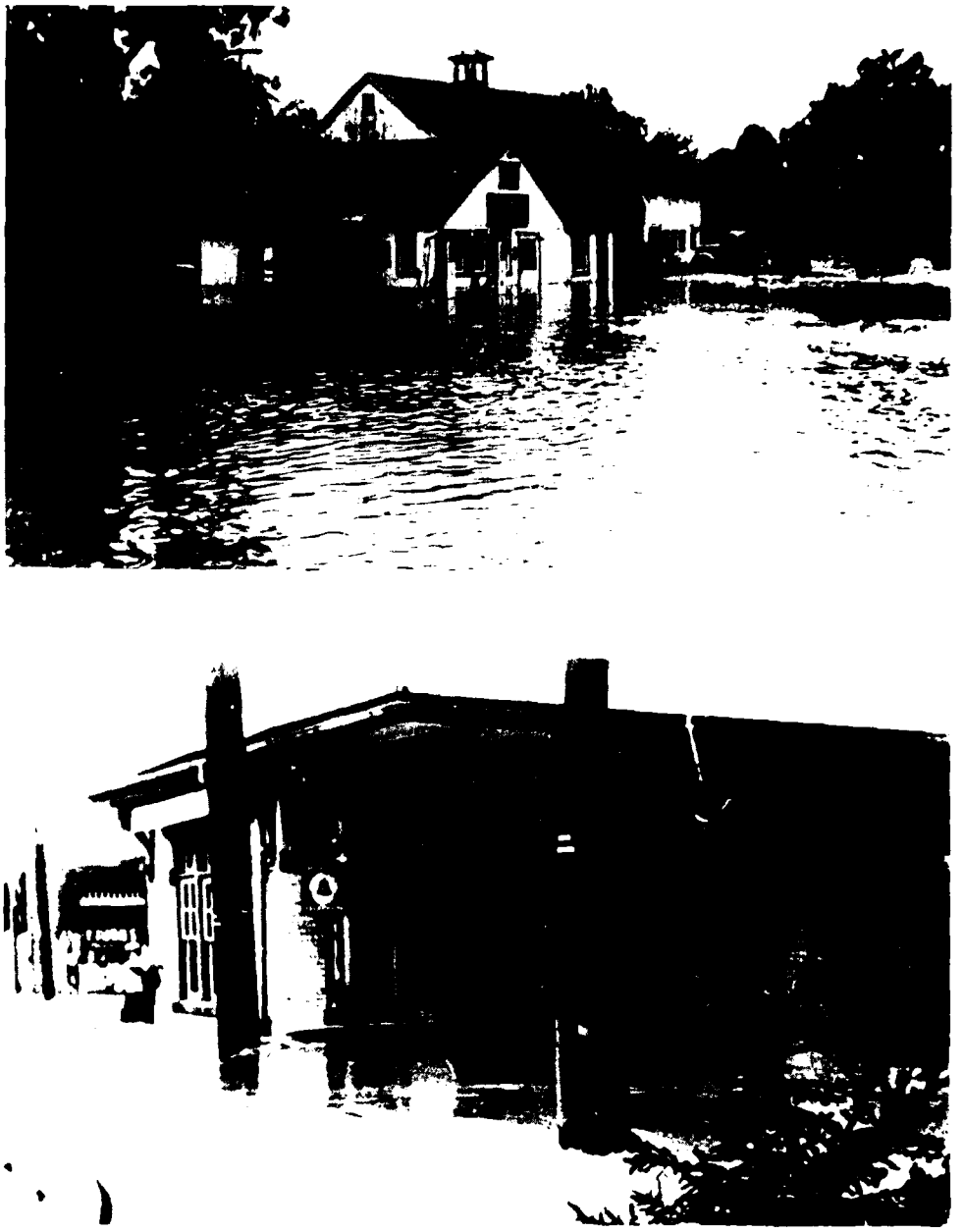


Figure 5.--FLOOD PHOTOGRAPHS IN SELLERSVILLE, PENNSYLVANIA
Photographs show the August 9, 1942 flood in the Sellersville area.

Figure 6.--FLOOD PHOTOGRAPH IN SELLERSVILLE, PENNSYLVANIA
Photograph shows the August 9, 1942 flood in the Sellersville area.

Flood represents a reasonable upper limit of expected flooding in the study area. The Intermediate Regional Flood may reasonably be expected to occur more frequently, although it will not be as severe as the infrequent Standard Project Flood.

Large floods have been experienced in the past on streams with similar geographical and physiographical characteristics as those found in the study area. This same heavy flooding could occur over the East Branch Perkiomen Creek watershed. In this event, floods would result in the study area comparable in size to those experienced on neighboring streams. It is therefore desirable, in connection with any determination of future floods which may occur in this study area, to consider storms and floods that have occurred in a region where the topography, watershed cover, and physical characteristics are similar.

DETERMINATION OF INTERMEDIATE REGIONAL FLOOD

The Intermediate Regional Flood is defined as a flood having an average frequency of occurrence in the order of once in 100 years at a designated location, although the flood may occur in any year. Probability estimates are based on statistical analyses of streamflow records available for the watershed under study. However, limitations in such records usually require analyses of rainfall and runoff characteristics on a regional rather than a watershed basis. The Intermediate Regional Flood is considered a major flood although it is less severe than the Standard Project Flood.

In determining the Intermediate Regional Flood for the East Branch Perkiomen Creek, statistical studies were made using the

yearly record of known flood data of the U.S.G.S. gaging station at Graterford.

Results of the study indicate that the Intermediate Regional Flood on the East Branch Perkiomen Creek would have a peak discharge of 8,400 cubic feet per second at the lower limit of the study area. A more detailed listing of computed peak discharges of the Intermediate Regional Flood for this stream is shown in tables 1 and 8.

The Intermediate Regional Flood stage at the Sellersville Sewage Disposal Plant would be about 0.7 foot higher than the September 12, 1960 flood and 0.9 foot higher than the August 9, 1942 flood at this location.

TABLE 8

INTERMEDIATE REGIONAL FLOOD

PEAK DISCHARGES

EAST BRANCH PERKIOMEN CREEK

Location	Station	Drainage Area	Discharge
	miles	sq. mi.	cfs
Lower Study Limit (Above Dam)	0.0	39.0	8,400
Above Mill Creek	3.6	29.2	6,800
Above Pleasant Spring Creek	5.1	17.9	5,600
Above Morris Run	8.2	6.4	2,620

DETERMINATION OF STANDARD PROJECT FLOOD

The U. S. Army Corps of Engineers, in cooperation with the U. S. Weather Bureau, has made broad and comprehensive studies and investigations based on past records of experienced storms and floods and has developed generalized procedures for estimating the flood potential of streams. These procedures have been used in determining the Standard Project Flood. It is defined as a major flood that can reasonably be expected to occur from a severe combination of meteorological and hydrological conditions that are considered characteristic of the geographical region involved. However, it is a commonly accepted fact that a more severe flood than any that have occurred in the past can and will occur.

A Standard Project Flood estimate has been made for the East Branch Perkiomen Creek study area. Peak discharges for this flood at selected locations in the study area are shown in tables 1 and 9.

The Standard Project Flood hydrographs are shown in plate 3.

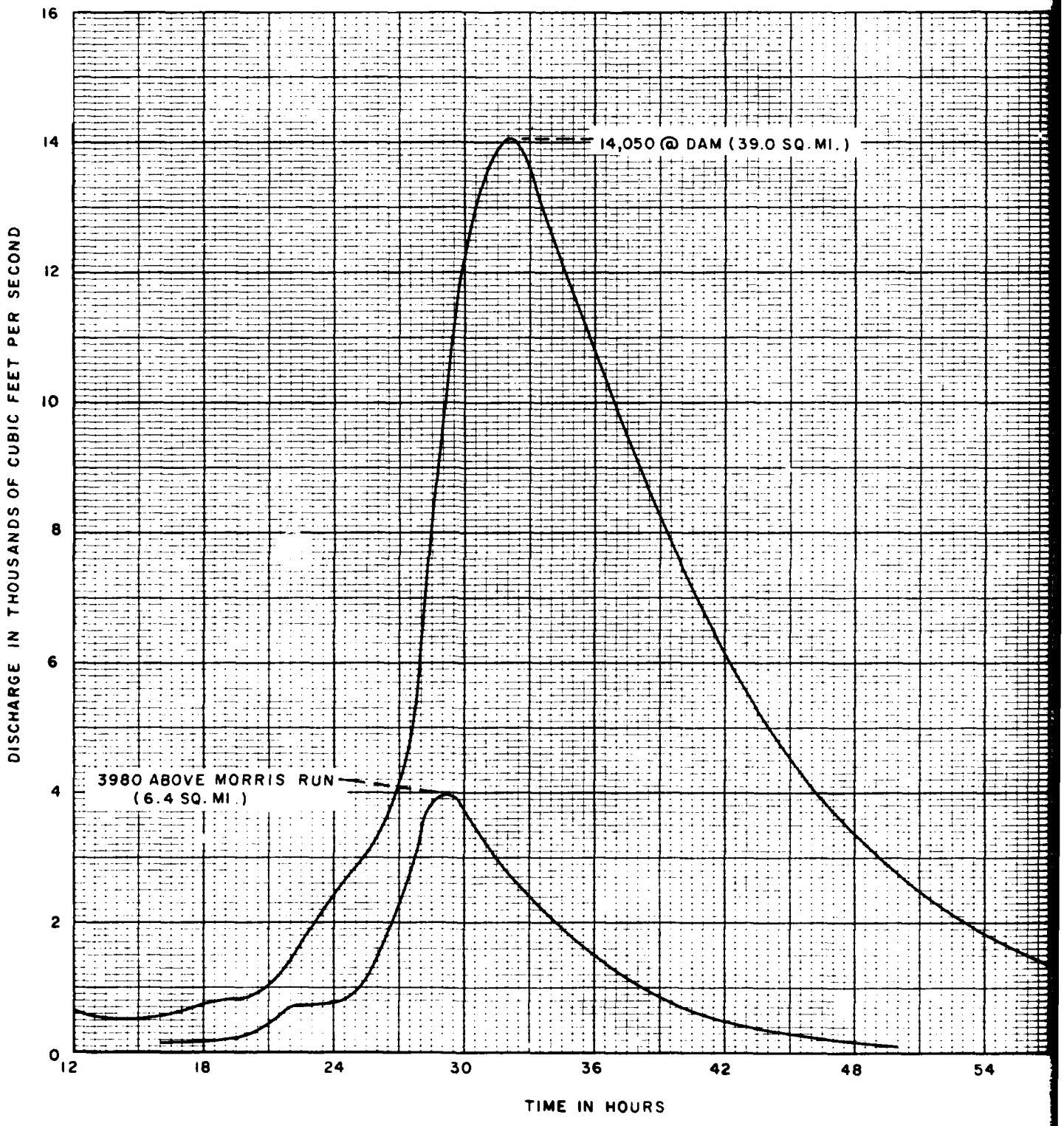
TABLE 9

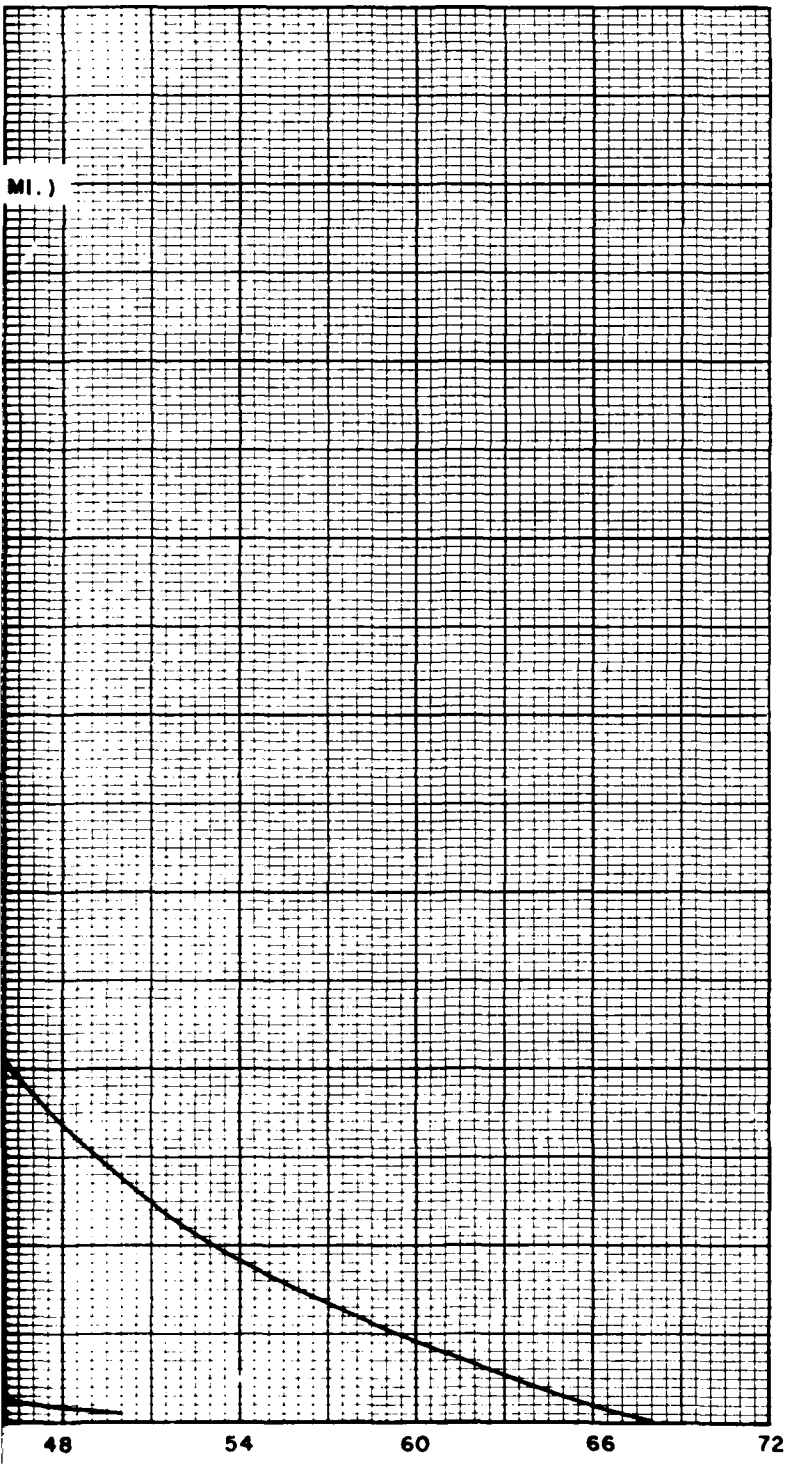
STANDARD PROJECT FLOOD

PEAK DISCHARGES

EAST BRANCH PERKIOMEN CREEK

Location	Station	Drainage Area	Discharge
	miles	sq. mi.	cfs
Lower Study Limit (Above Dam)	0.0	39.0	14,050
Above Mill Creek	3.6	29.2	12,300
Above Pleasant Spring Creek	5.1	17.9	8,180
Above Morris Run	8.2	6.4	3,980


16
14
12
10
8
6
4
2
0
DISCHARGE IN THOUSANDS OF CUBIC FEET PER SECOND
14,050 @ DAM (39.0 SQ. MI.)
3980 ABOVE MORRIS RUN
(6.4 SQ. MI.)
12
18
24
30
36
42
48
54
TIME IN HOURS



CORPS OF ENGINEERS U.S. ARMY
PHILADELPHIA DISTRICT

STANDARD PROJECT FLOOD HYDROGRAPHS

EAST BRANCH PERKIOMEN
BUCKS COUNTY, PA.

PLATE 3

FREQUENCY

It is not practical to assign a frequency to the Standard Project Flood. The occurrence of such a flood would be a rare event; however, it could occur in any year.

POSSIBLE LARGER FLOODS

Floods larger than the Standard Project Flood are possible; however, the combination of factors that would be necessary to produce a flood of this magnitude would seldom occur. The consideration of such a severe flood is of greater importance in some areas than in others but it should not be overlooked in the study of any flood area.

HAZARDS OF GREAT FLOODS

The amount and extent of damage caused by any flood depends, generally, upon the height and duration of flooding, velocity of flow, rate of rise, and the extent of areas covered by the flood.

AREAS FLOODED AND HEIGHTS OF FLOODING

The areas along the East Branch Perkiomen Creek within the study limits that would be flooded by the Intermediate Regional and Standard Project Floods are shown on plates 5 through 9. Depths of flow for these floods can be estimated from the high water profiles shown on plates 10 and 11.

The profiles of the stream were computed using stream characteristics determined from profiles, topographic maps, and valley

cross sections surveyed during July - November 1969. The elevations shown on plates 10 and 11, and the overflow areas shown on plates 5 through 9 have been determined with an accuracy consistent with the purposes of this study and the accuracy of the basic data.

The profiles for the Intermediate Regional and Standard Project Floods depend in part on the degree of destruction or clogging of various bridges during the flood. As it is nearly impossible to forecast these events, it was assumed that all bridge structures would stand and that no serious clogging would occur.

Figures 7 and 8 show the heights that would be reached by the Standard Project and Intermediate Regional Floods at selected locations within the flood plain in the study area.

VELOCITIES, RATES OF RISE AND DURATION

Water velocities during floods depend largely on the size and shape of the cross sections, conditions of the stream, and the bed slope, all of which vary on different streams and at different locations on the same stream. Velocities of 4 to 8 feet per second or higher are not uncommon in large floods.

Table 10 lists the maximum velocities that would occur in the main channel and overbank areas of East Branch Perkiomen Creek during the Intermediate Regional and Standard Project Floods.

Table 11 lists the total rise from normal flow to the crest of flood, maximum rates of rise, and duration above bankfull stage for several large historical floods at the site of the U.S.G.S. gage on Perkiomen Creek at Graterford, Pennsylvania.

The rates of rise and high stream velocities in combination with deep, long-duration flooding would create a hazardous situation in developed areas. Velocities greater than three feet per second combined with depths of three feet or more are generally considered hazardous.

TABLE 10

MAXIMUM VELOCITIES

EAST BRANCH PERKIOMEN CREEK

Station 1/ miles	Location	Flood	Maximum Velocities 2/ Channel	Overbank
			ft. per second	
0.74	Bucks - Montgomery Line County Line Road	Intermediate Regional	6.6	2.1
		Standard Project	7.0	2.8
3.73	Sewage Treatment Plant Sellersville, Pa.	Intermediate Regional	5.9	2.2
		Standard Project	6.1	2.6
5.97	Callowhill Road	Intermediate Regional	5.2	1.7
		Standard Project	5.3	2.0
8.94	Doylestown Road (Pa. Rt. 313)	Intermediate Regional	3.4	1.2
		Standard Project	3.6	1.4
11.93	Slotter Road	Intermediate Regional	4.6	2.1
		Standard Project	4.8	2.3

1/ Station zero is the second dam on the East Branch Perkiomen Creek below the Bucks - Montgomery County Line.

2/ Maximum velocities are shown for the downstream side of all bridges.

TABLE 11

ESTIMATED RATES OF RISE AND DURATION OF FLOODS

U.S.G.S. GAGE, GRATERFORD, PENNSYLVANIA

Flood	Height of Rise * feet	Time of Rise hours	Maximum Rate of Rise ft. per hr.	Duration Above Bankfull hours
July 9, 1935	15.6	10.0	2.6	13.7
August 23-24, 1933	13.5	12.0	2.0	16.2
June 2, 1946	14.1	13.5	1.8	14.3
August 9, 1942	14.0	6.5	4.1	10.5

* Rise in feet above normal flow.

Figure 7.--FLOOD HEIGHTS ALONG EAST BRANCH PERKIOMEN CREEK

Top view is in front of Bucks Furniture Store; the arrows indicate the heights the Standard Project and the Intermediate Regional Floods could reach and the height of the 1942 flood. Bottom view was taken at the Sellersville Fire Co.; the arrows indicate the heights the Standard Project and Intermediate Regional Floods would reach.

PLATE 8.--FLOOD HEIGHTS ALONG EAST BRANCH PERKIOMEN CREEK

The arrows indicate the heights that the Standard Project and Intermediate Regional Floods could reach at Bucks Road Bridge.

GLOSSARY OF TERMS

Flood. An overflow of lands not normally covered by water and that are used or usable by man. Floods have two essential characteristics: the inundation of land is temporary; and the land is adjacent to an inundated by overflow from a river or stream or an ocean, lake, or other body of standing water.

Normally a "flood" is considered as any temporary rise in stream flow or stage, but not the ponding of surface water, that results in significant adverse effects in the vicinity. Adverse effects may include damages from overflow of land area, temporary backwater effects in sewers and local drainage channels, creation of unsanitary conditions or other unfavorable situations by deposition of materials in stream channels during flood recessions, rise of ground water coincident with increased stream flow, and other problems.

Flood Crest. The maximum stage or elevation reached by the waters of a flood at a given location.

Flood Peak. The maximum instantaneous discharge of a flood at a given location. It usually occurs at or near the time of the flood crest.

Flood Plain. The relatively flat area or lowlands adjoining the channel of a river, stream or watercourse or ocean, lake, or other body of standing water, which has been or may be covered by flood water.

Flood Profile. A graph showing the relationship of water surface elevation to location, the latter generally expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.

Flood Stage. The stage or elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area in which the elevation is measured.

Head Loss. The effect of obstructions, such as narrow bridge openings or buildings that limit the area through which water must flow, raising the surface of the water upstream from the obstruction.

Intermediate Regional Flood. A flood having an average frequency of occurrence in the order of once in 100 years although the flood may occur in any year. It is based on statistical analyses of stream flow records available for the watershed and analyses of rainfall and runoff characteristics in the general region of the watershed.

Left Bank. The bank on the left side of a river, stream, or watercourse, looking downstream.

Low Steel (or Underclearance). See "Underclearance".

Right Bank. The bank on the right side of a river, stream, or watercourse, looking downstream.

Standard Project Flood. The flood that may be expected from the most severe combination of meteorological and hydrological conditions that is considered reasonably characteristic of the geographical area in which the drainage basin is located, excluding extremely rare combinations. Peak discharges for these floods are generally about 40% to 60% of the Probable Maximum Floods for the same basins. Such floods, as used by the Corps of Engineers, are intended as practicable expressions of the degree of protection that should be sought in the design of flood control works, the failure of which might be disastrous.

Underclearance. The lowest point of a bridge or other structure over or across a river, stream, or watercourse that limits the opening through which water flows. This is referred to as "low steel" in some regions.

AUTHORITY, ACKNOWLEDGMENTS AND INTERPRETATION OF DATA

This report has been prepared in accordance with the authority granted by Section 206 of the Flood Control Act of 1960 (Public Law 86-645), as amended.

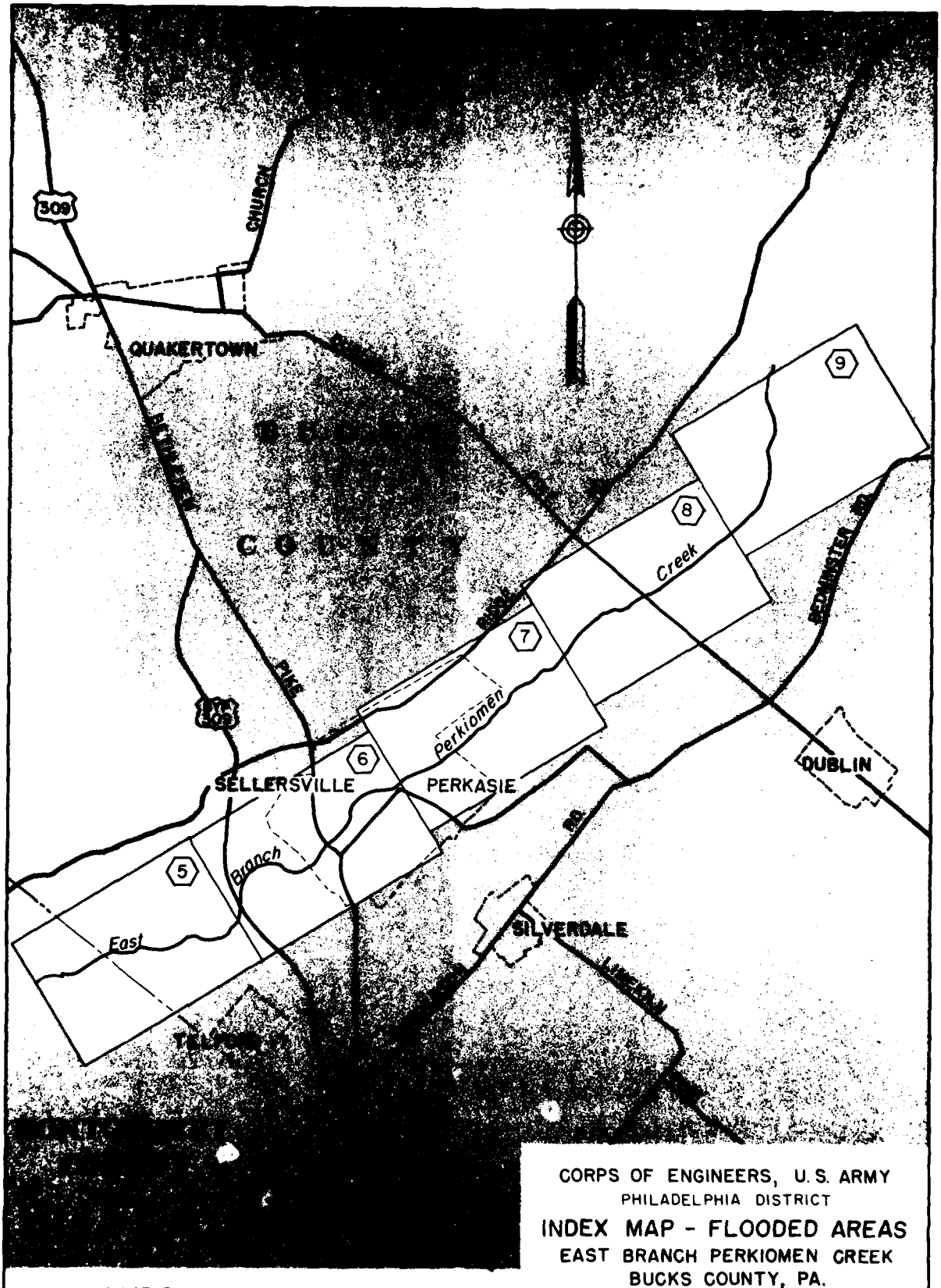
* * *

Assistance and cooperation of the U. S. Weather Bureau, U. S. Geological Survey, Bucks County Planning Commission, Boroughs of Sellersville and Perkasie, and private citizens in supplying useful data are appreciated. Flood photographs were made available through the courtesy of Mr. Willard E. Buck.

* * *

This report presents the flood situation for the East Branch Perkiomen Creek from the second dam located below the Montgomery - Bucks County Line upstream to the source in Bedminster Township, Bucks County, Pennsylvania. The Philadelphia District of the Corps of Engineers will, upon request, provide interpretation and limited technical assistance in the application of data presented in this report.

* * *



LEGEND

(5) PLATE NUMBER

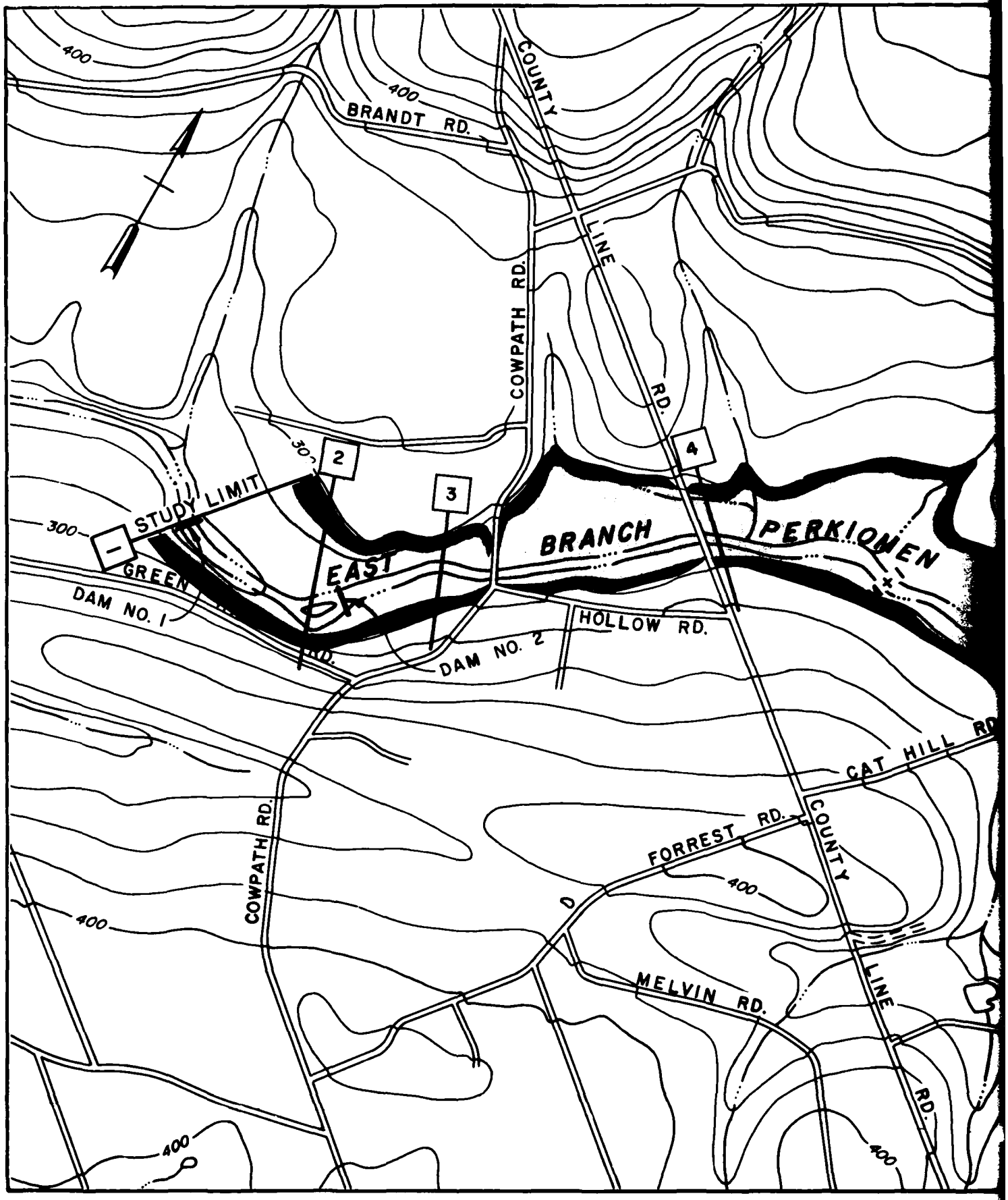
CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT

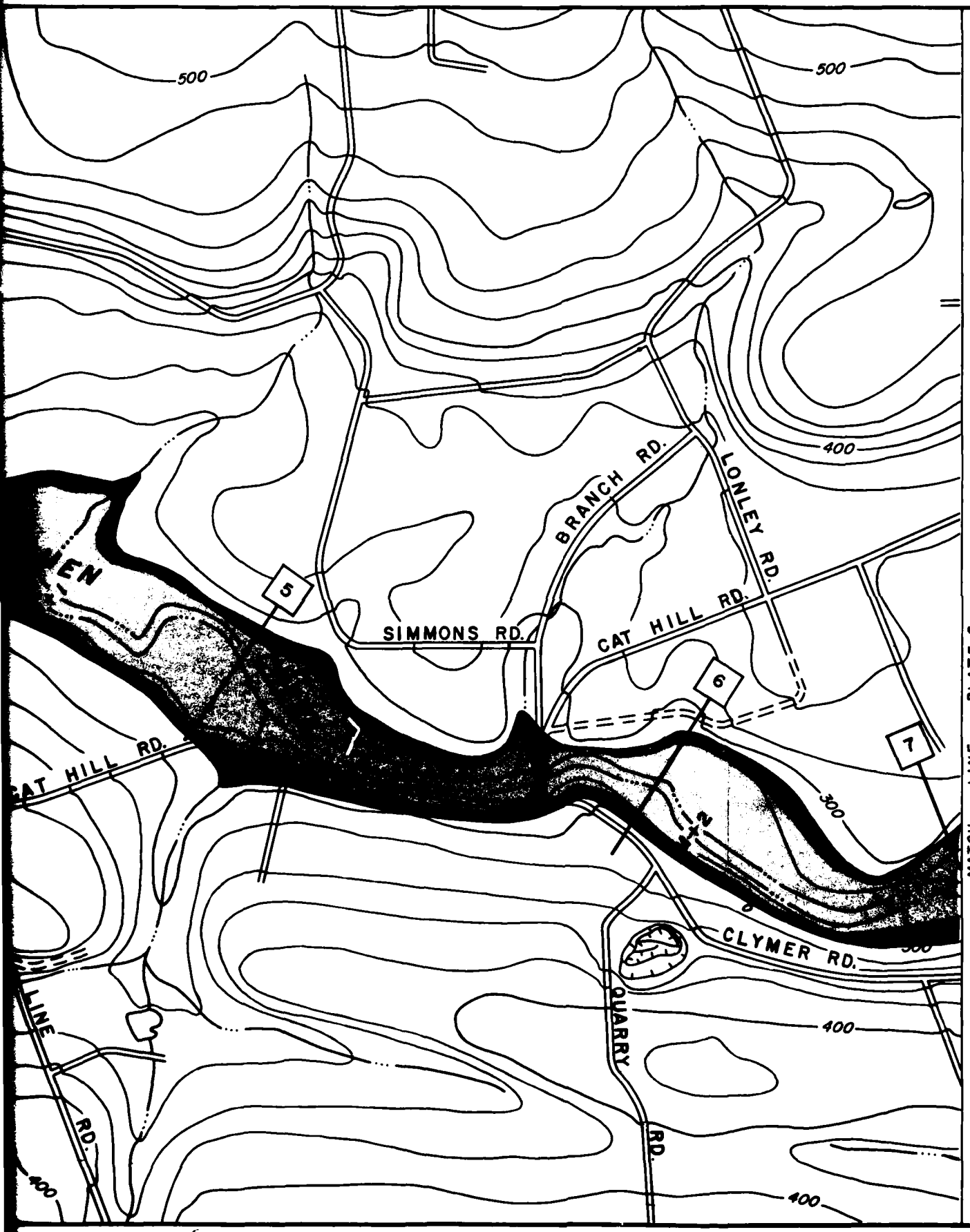
INDEX MAP - FLOODED AREAS
EAST BRANCH PERKIOMEN CREEK
BUCKS COUNTY, PA.

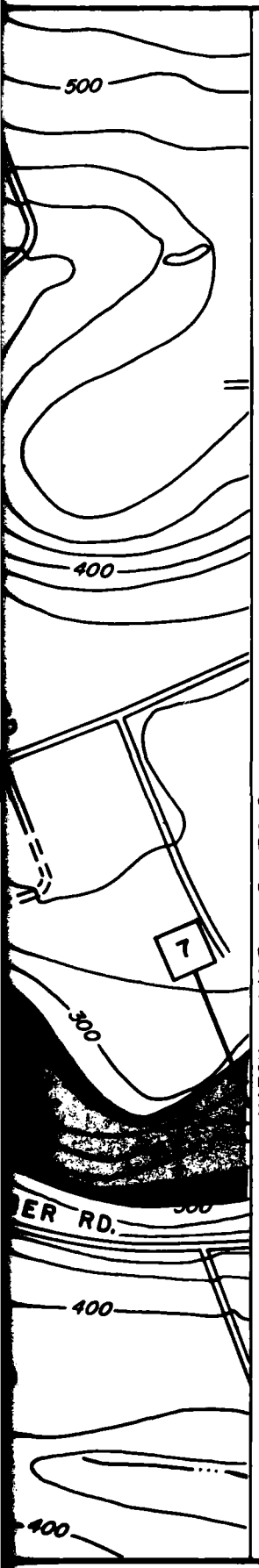
SCALE IN MILES
1 0 1 2

JANUARY 1971

PLATE 4


400
BRANDT RD.
COUNTY
LINE
RD.
COWPATH RD.
300
STUDY LIMIT
2
3
4
1
EAST
BRANCH
PERKIOMEN
GREEN
DAM NO. 1
DAM NO. 2
HOLLOW RD.
CAT HILL RD
FORREST RD.
COUNTY
LINE
RD.
COWPATH RD.
MELVIN RD.
400


500
500
400
BRANCH RD.
LONLEY RD.
SIMMONS RD.
CAT HILL RD.
5
6
7
CAT HILL RD.
300
CLYMER RD.
QUARRY RD.
400
400
400
MATCH LINE PLATE 6
M + 6
5
200
NOTES:
1. LIMIT
MAY
LOCA
EXPL
2. MINIM
IS 20
CORPS
EAST BRA
BUC



LEGEND

OVERFLOW LIMITS

- STANDARD PROJECT FLOOD
- INTERMEDIATE REGIONAL FLOOD
- M + 6 — MILES ABOVE MOUTH
- 5 — CROSS SECTION
- ~200~ — GROUND ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM

NOTES:

1. LIMITS OF OVERFLOWS SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
2. MINIMUM CONTOUR INTERVAL IS 20 FEET.

CORPS OF ENGINEERS, U.S. ARMY

PHILADELPHIA DISTRICT

FLOODED AREAS

EAST BRANCH PERKIOMEN CREEK

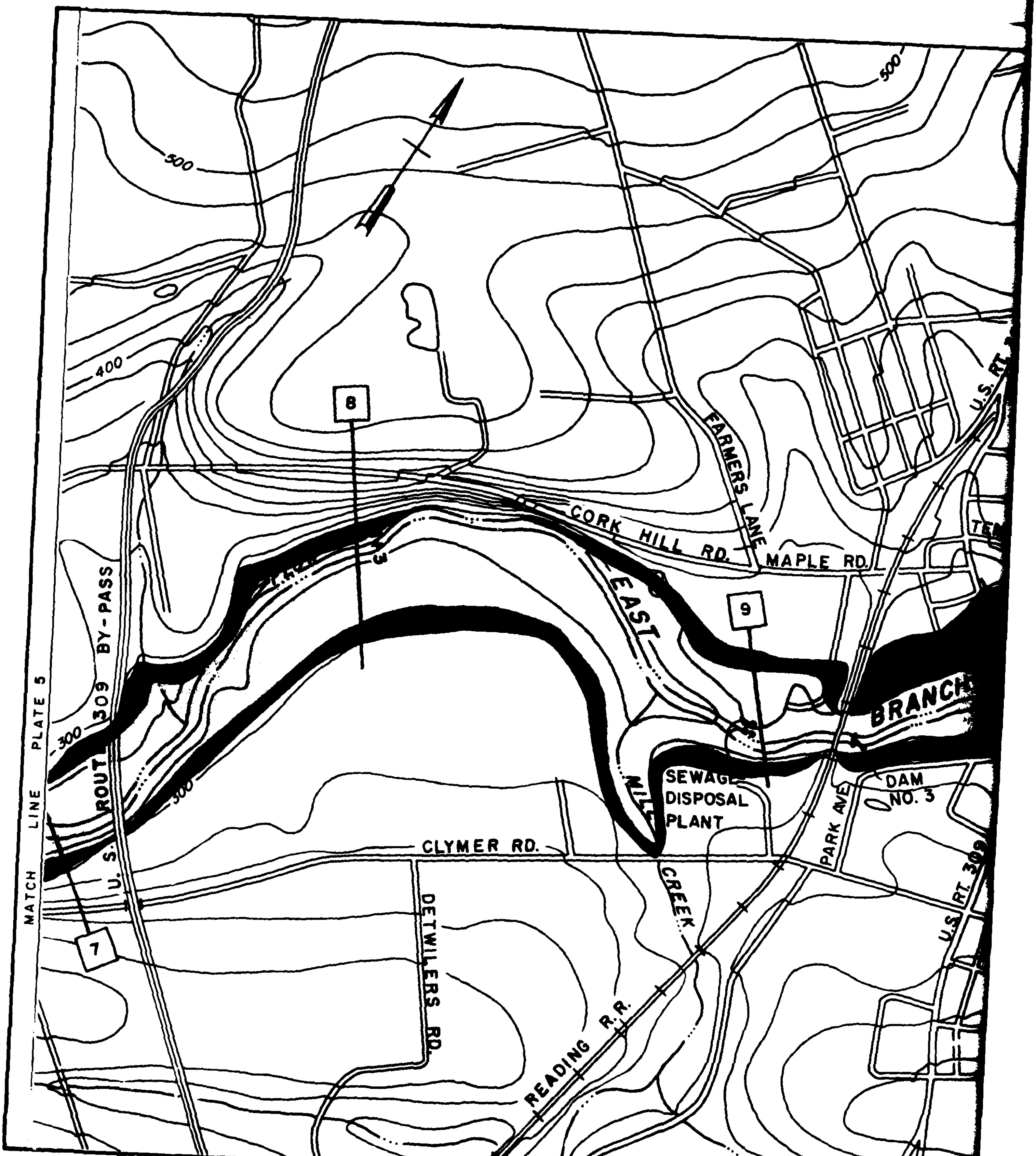
BUCKS COUNTY, PA.

SCALE IN FEET

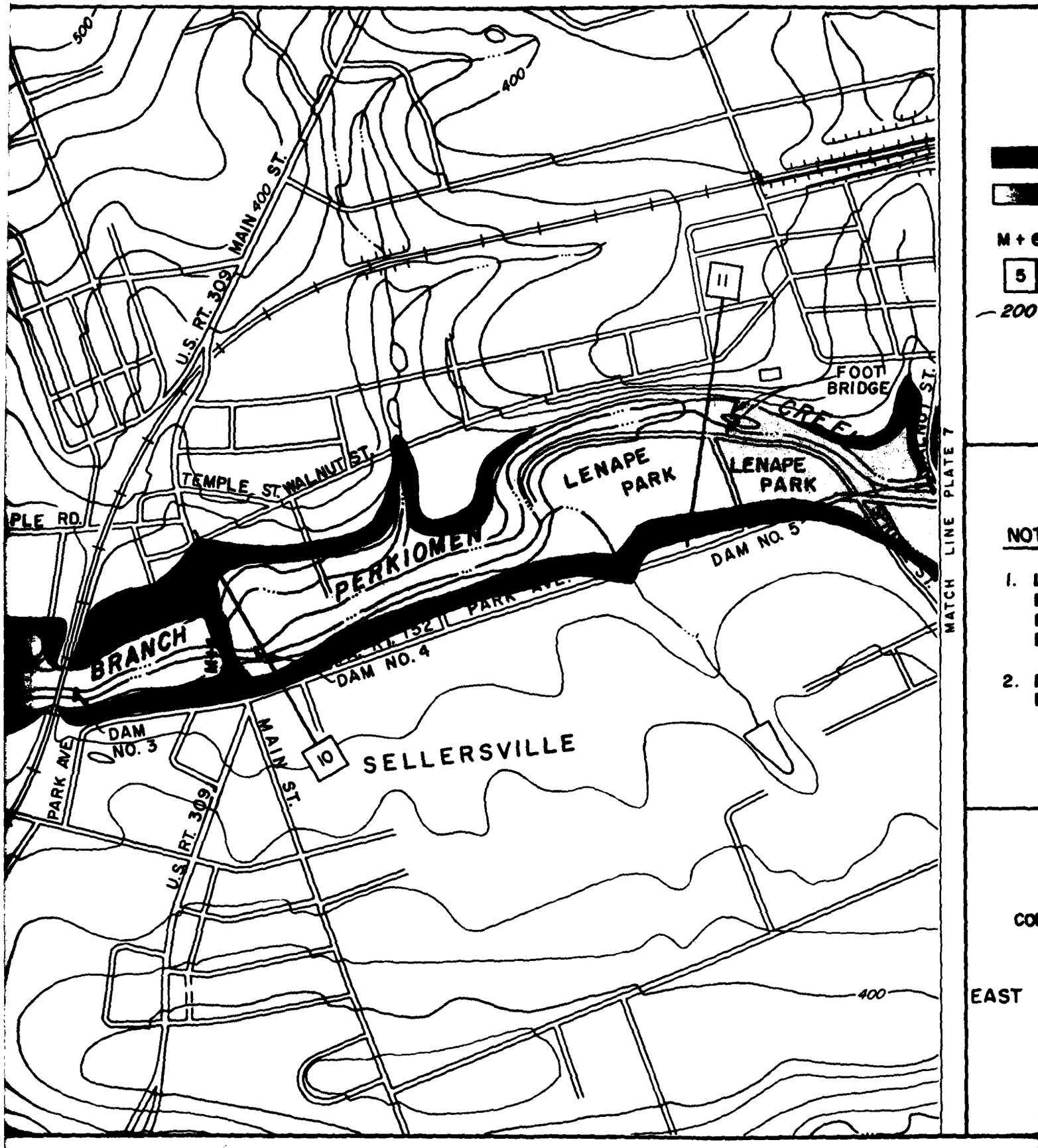
0 800 1600

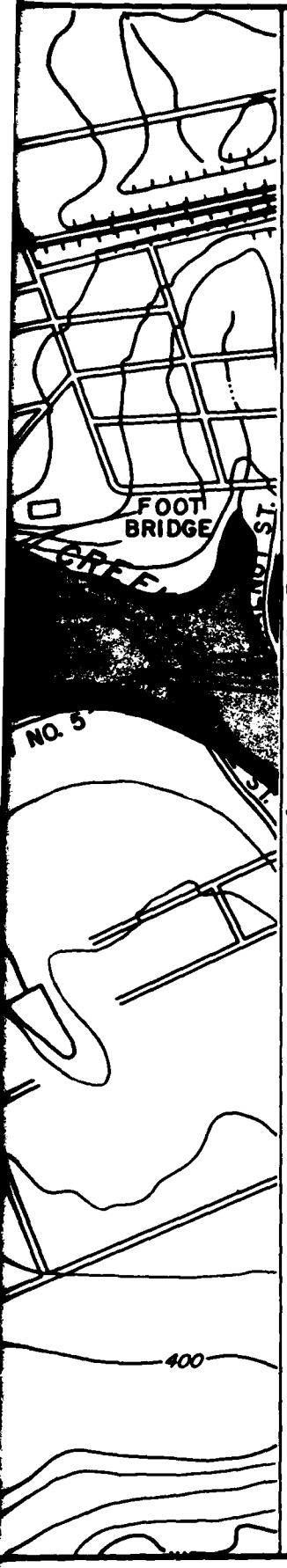
JANUARY 1971

PLATE 5



MATCH LINE PLATE 5
U.S. ROUTE 309 BY-PASS
500
400
300
8
9
7
CORK HILL RD.
MAPLE RD.
FARMERS LANE
EAST
BRANCH
MILL CREEK
SEWAGE DISPOSAL PLANT
DAM NO. 3
PARK AVE.
CLYMER RD.
DETWILERS RD.
READING R.R.
U.S. RT. 309


500
400
MAIN 400 ST.
U.S. RT. 309
FOOT BRIDGE
CREEK
LENAPE PARK
LENAPE PARK
TEMPLE ST.
WALNUT ST.
PLE RD.
PERKIOMEN
DAM NO. 5
PARK AVE.
BRANCH
DAM NO. 4
DAM NO. 3
PARK AVE
MAIN ST.
SELLERSVILLE
U.S. RT. 309
400
MATCH LINE PLATE 7
M + 6
5
200
NOT
1.
2.
CO
EAST



LEGEND

OVERFLOW LIMITS

- STANDARD PROJECT FLOOD
- INTERMEDIATE REGIONAL FLOOD
- M + 6 — MILES ABOVE MOUTH
- 5 — CROSS SECTION
- —200— GROUND ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM

NOTES:

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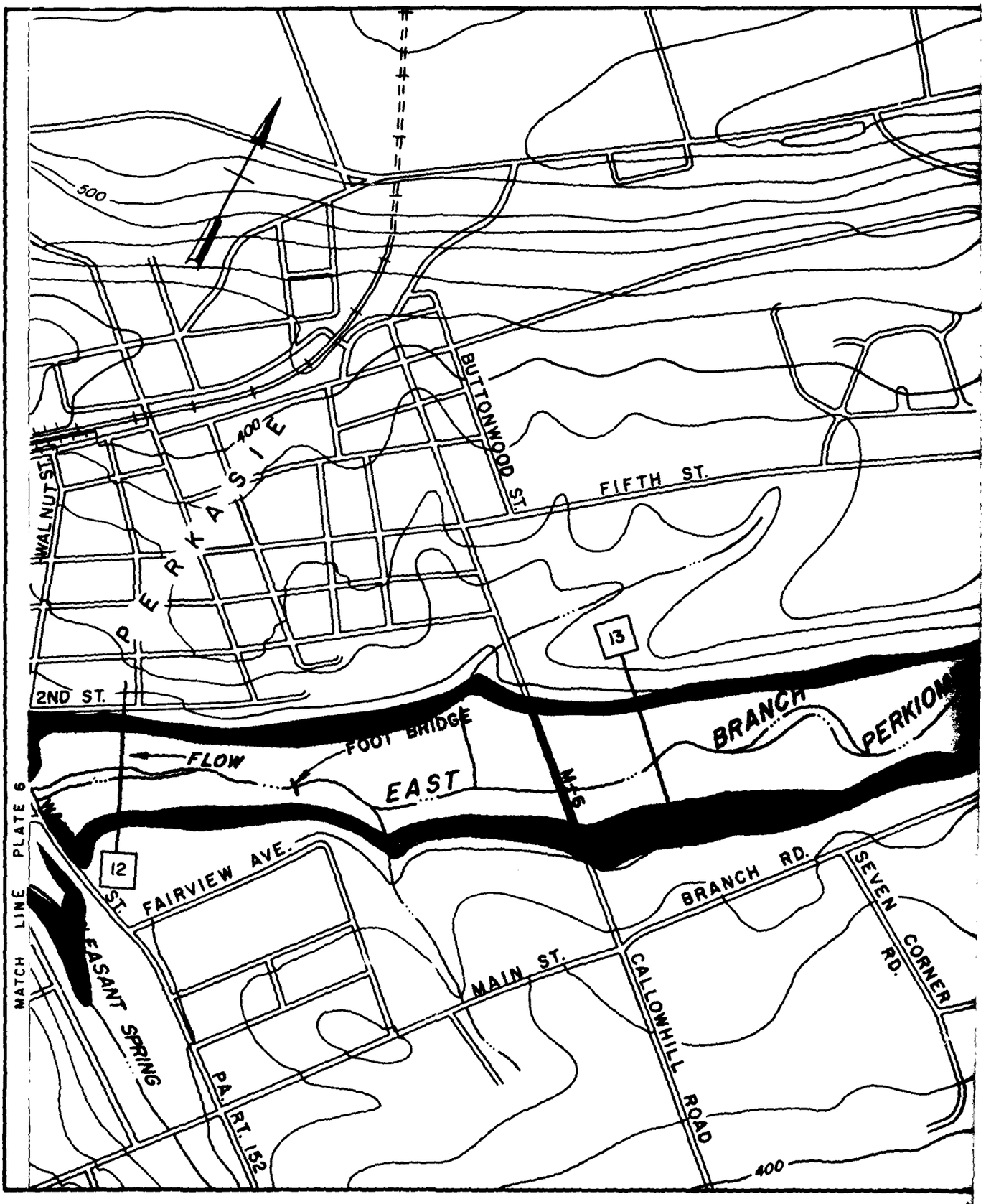
CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT

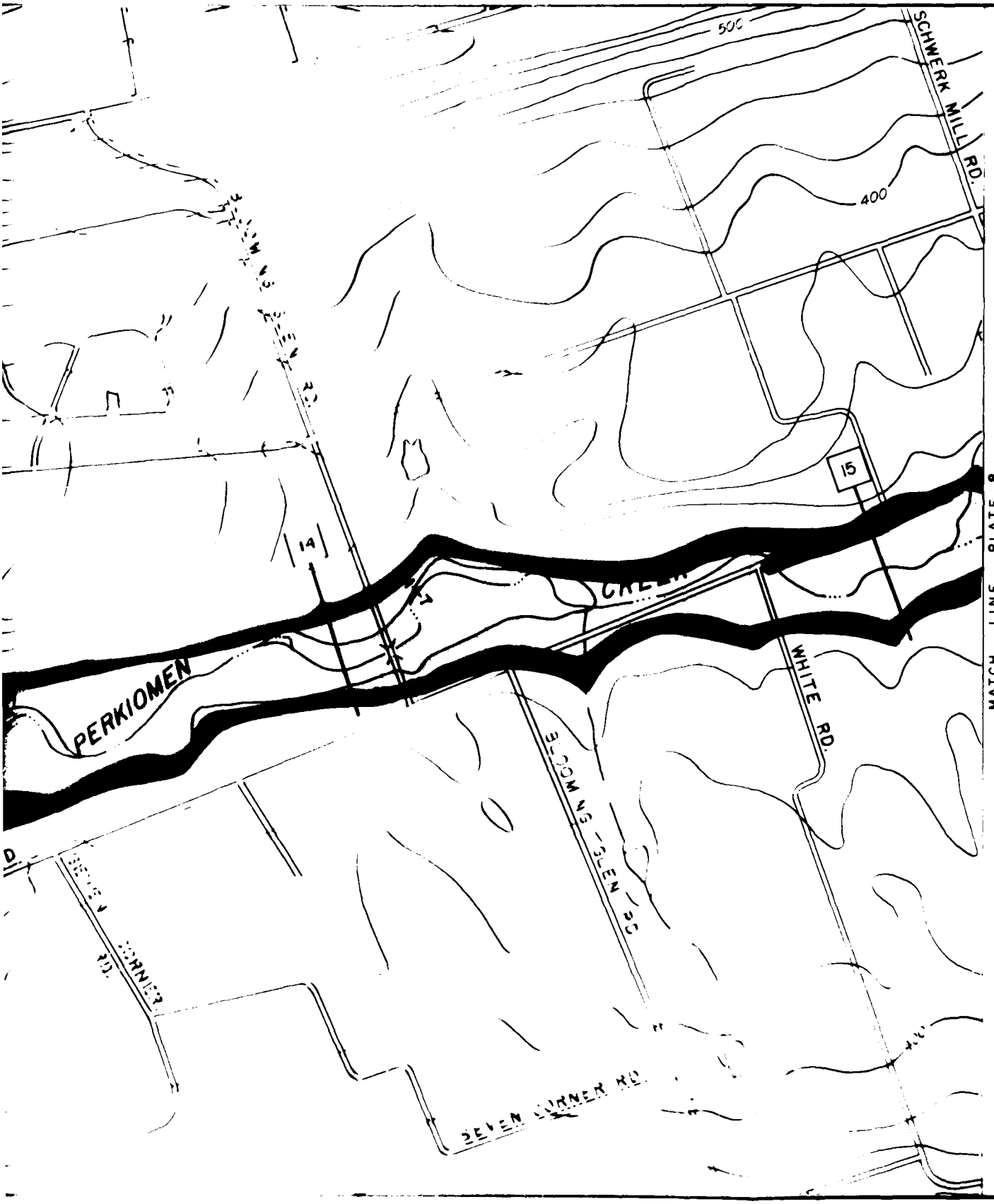
FLOODED AREAS
EAST BRANCH PERKIOMEN CREEK
BUCKS COUNTY, PA.

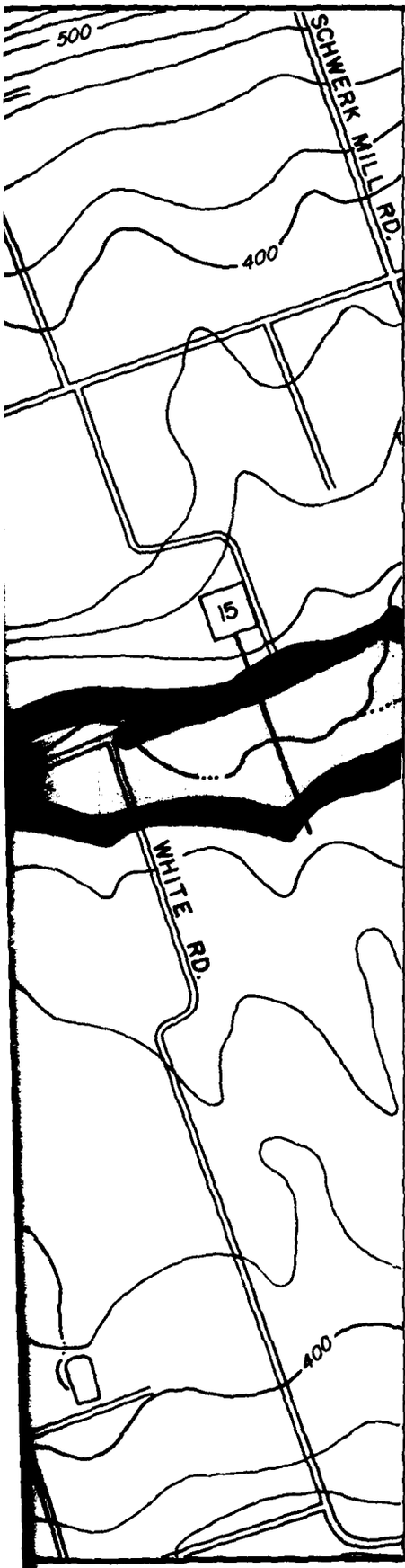
SCALE IN FEET
0 800 1600

JANUARY 1971

PLATE 6


500
400
BUTTONWOOD ST.
FIFTH ST.
WALNUT ST.
PERKASIE
2ND ST.
13
12
FOOT BRIDGE
FLOW
EAST
BRANCH
PERKIOM
FAIRVIEW AVE.
ST.
BRANCH RD.
SEVEN CORNER RD.
MAIN ST.
CALLOWHILL ROAD
PA. RT. 152
PLEASANT SPRING
MATCH LINE PLATE 6


500
400
SCHWERK MILL RD.
15
14
PERKIOMEN
WHITE RD.
MATCH LINE PLATE 8
SEVEN CORNER RD.



LEGEND

OVERFLOW LIMITS

- STANDARD PROJECT FLOOD
- INTERMEDIATE REGIONAL FLOOD
- M + 6 — MILES ABOVE MOUTH
- 5 — CROSS SECTION
- ~200~ — GROUND ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM

NOTES:

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CORPS OF ENGINEERS, U.S. ARMY

PHILADELPHIA DISTRICT

FLOODED AREAS

EAST BRANCH PERKIOMEN CREEK

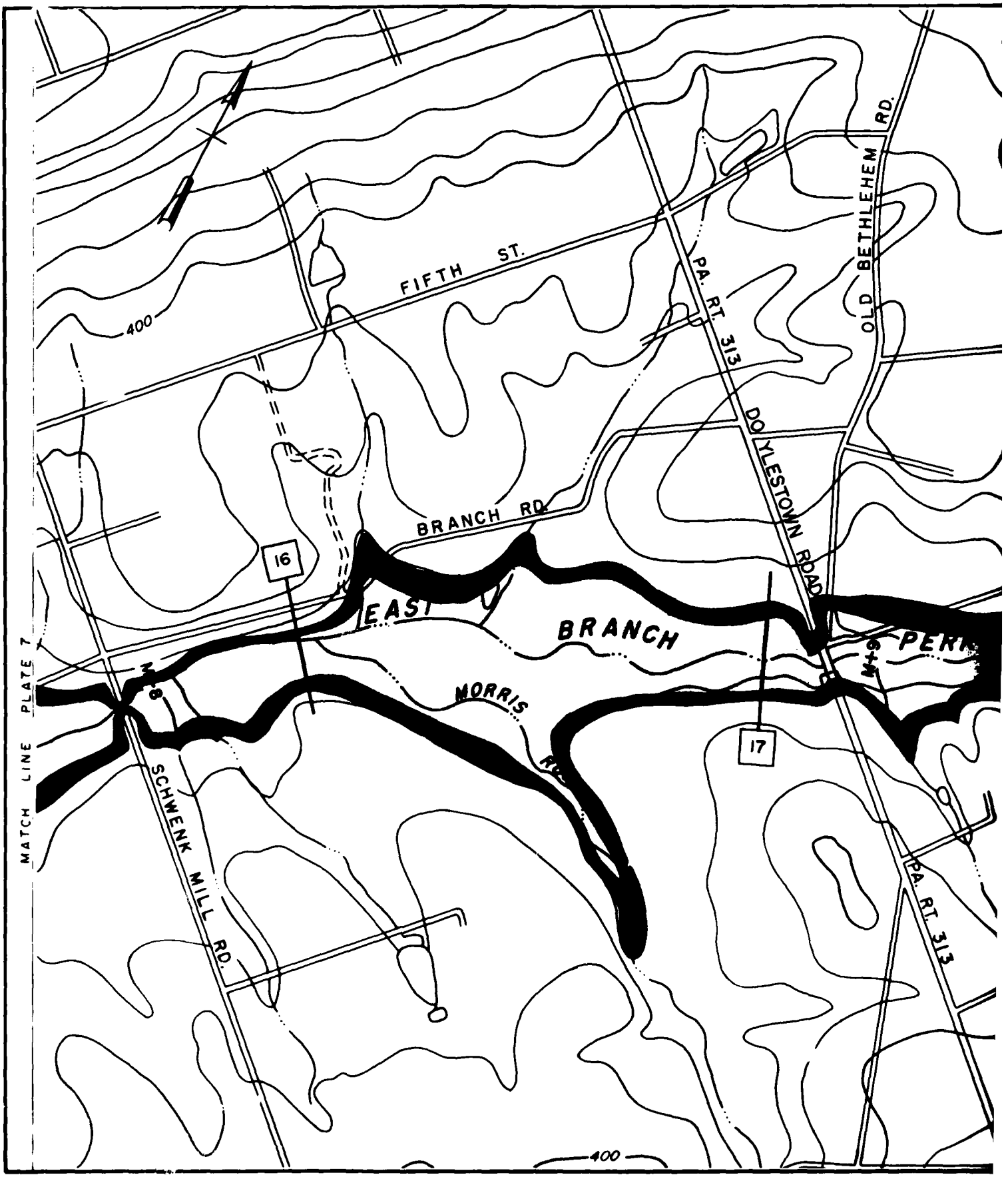
BUCKS COUNTY, PA.

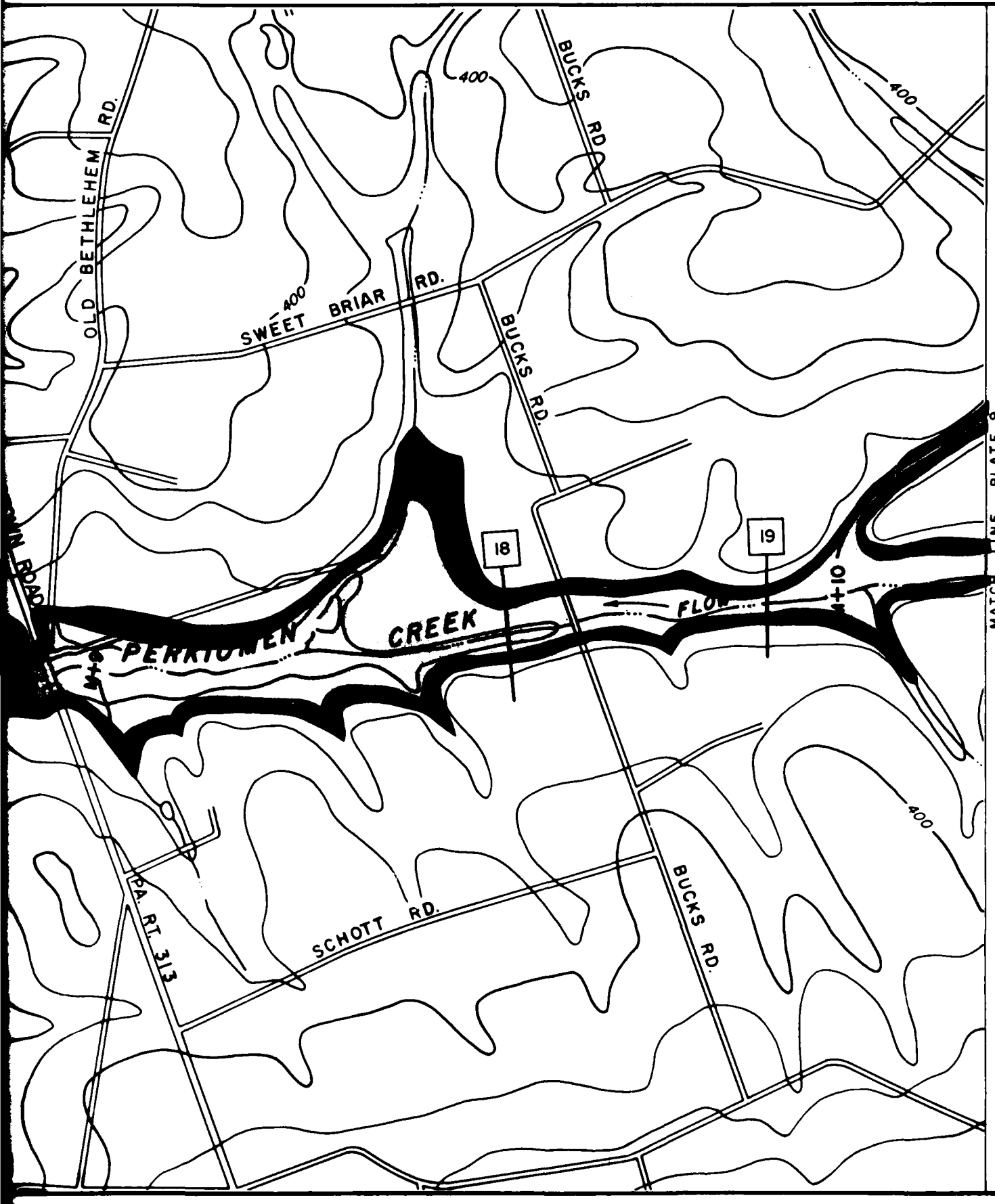
SCALE IN FEET

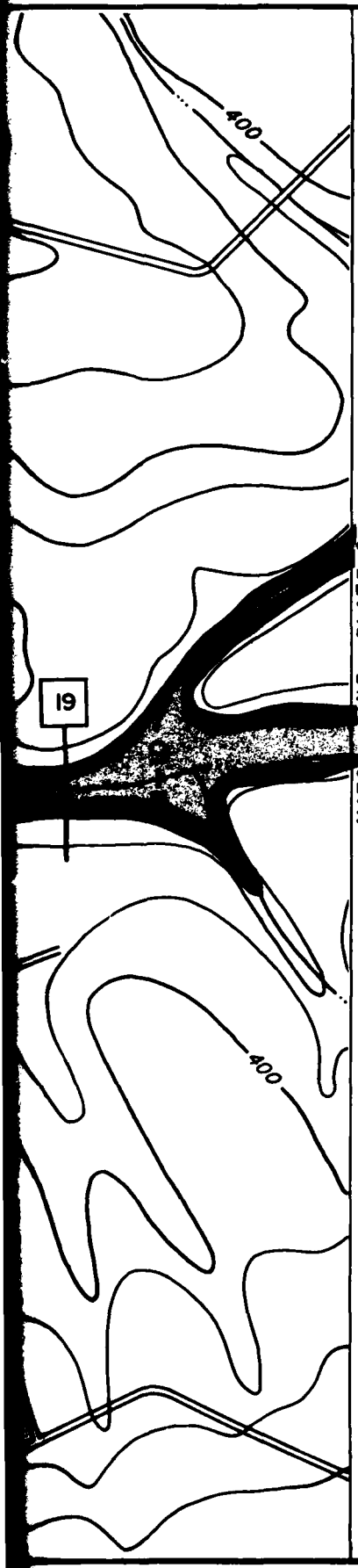
0 800 1600

JANUARY 1971

PLATE 7


MATCH LINE PLATE 7
FIFTH ST.
400
PA. RT. 313
DOYLESTOWN ROAD
OLD BETHLEHEM RD.
BRANCH RD.
16
EAST
BRANCH
MORRIS
SCHWENK MILL RD.
17
PA. RT. 313
400


OLD BETHLEHEM RD.
SWEET BRIAR RD.
BUCKS RD.
400
18
19
10
FLOW
PERKIOMEN CREEK
M+6
MATCH LINE PLATE 9
PA. RT. 313
SCHOTT RD.



LEGEND

OVERFLOW LIMITS

- STANDARD PROJECT FLOOD
- INTERMEDIATE REGIONAL FLOOD
- M + 6 — MILES ABOVE MOUTH
- 5 — CROSS SECTION
- ~200~ — GROUND ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM

NOTES:

1. LIMITS OF OVERFLOWS SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
2. MINIMUM CONTOUR INTERVAL IS 20 FEET.

CORPS OF ENGINEERS, U.S. ARMY

PHILADELPHIA DISTRICT

FLOODED AREAS

EAST BRANCH PERKIOMEN CREEK

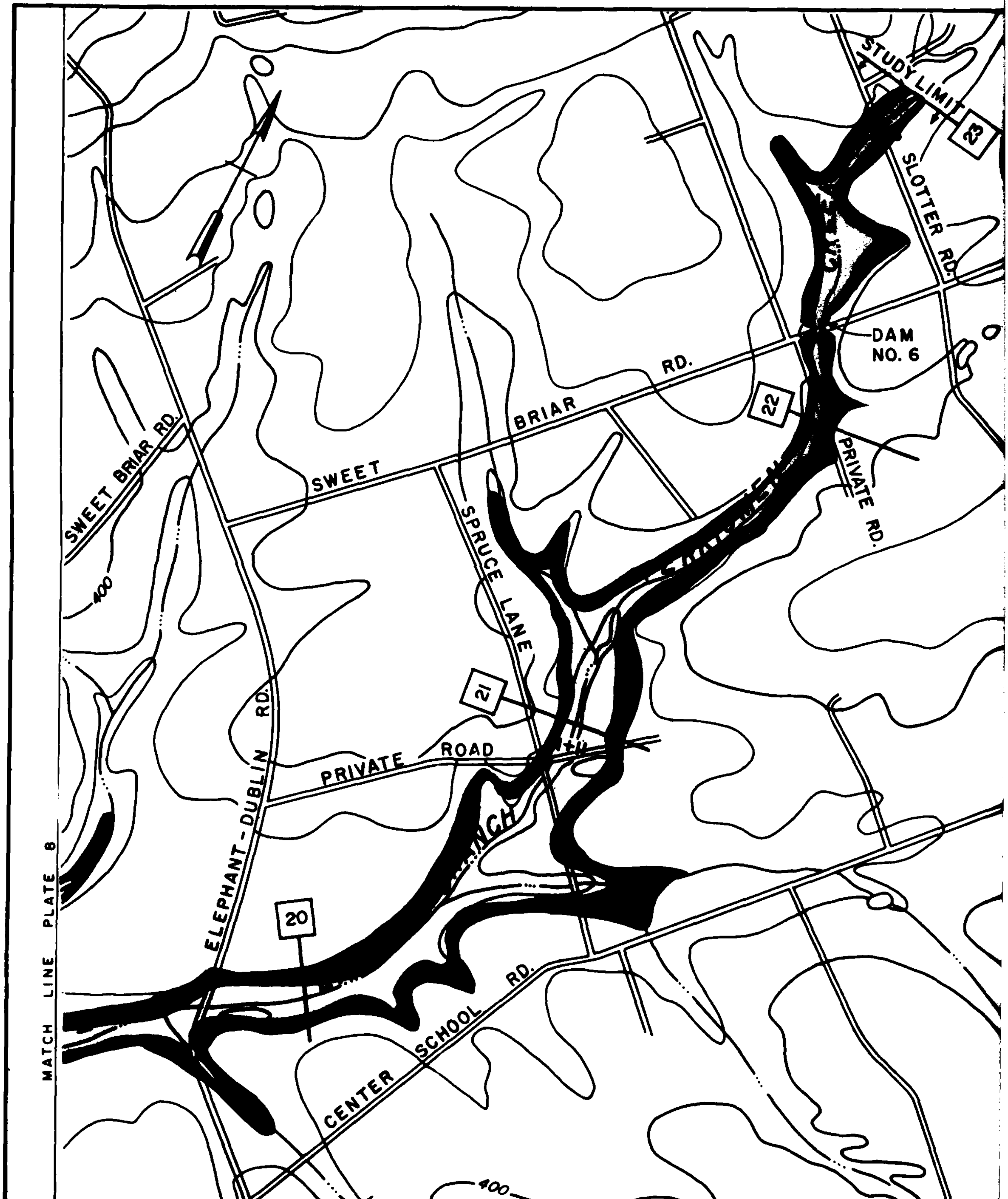
BUCKS COUNTY, PA.

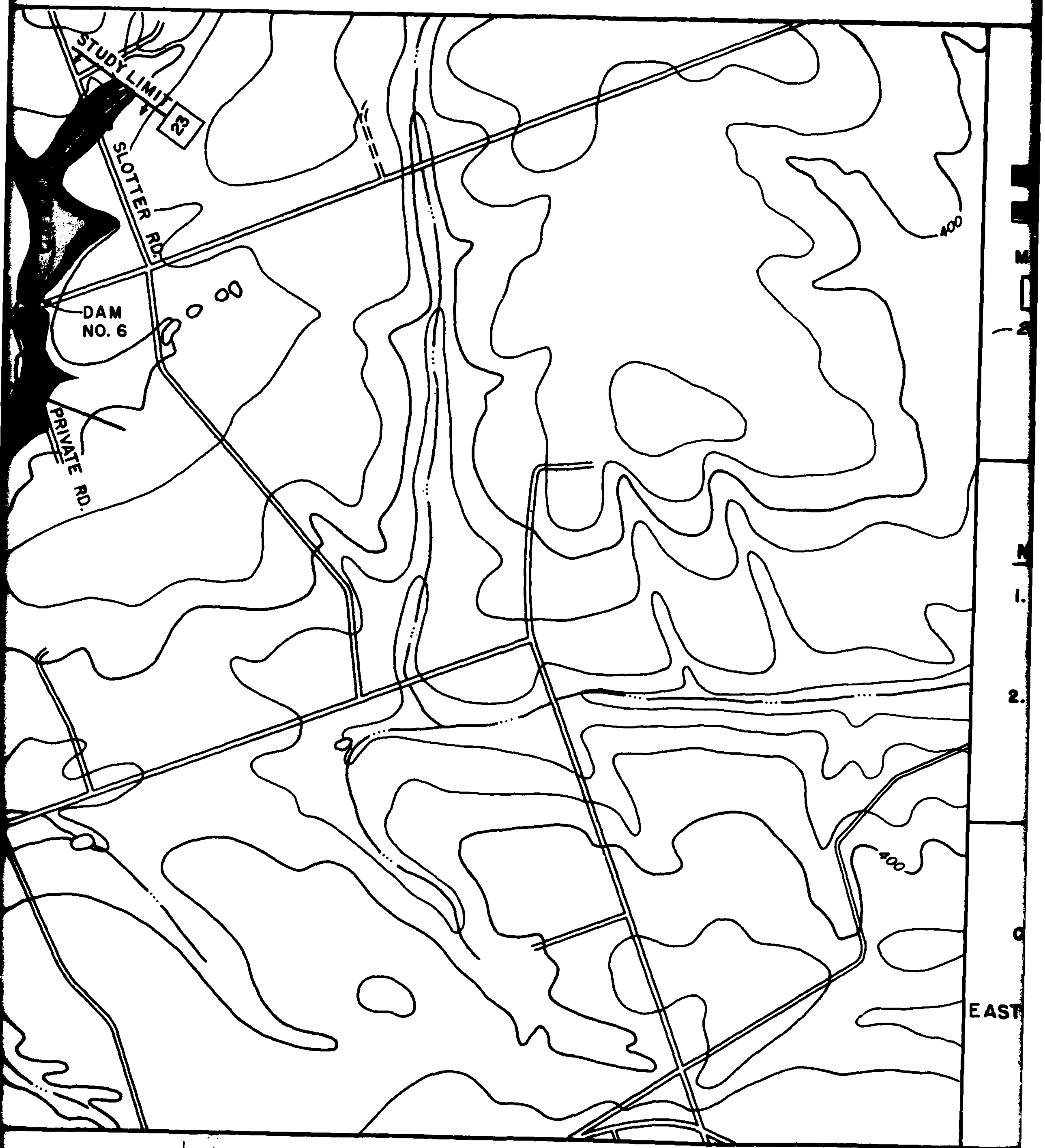
SCALE IN FEET

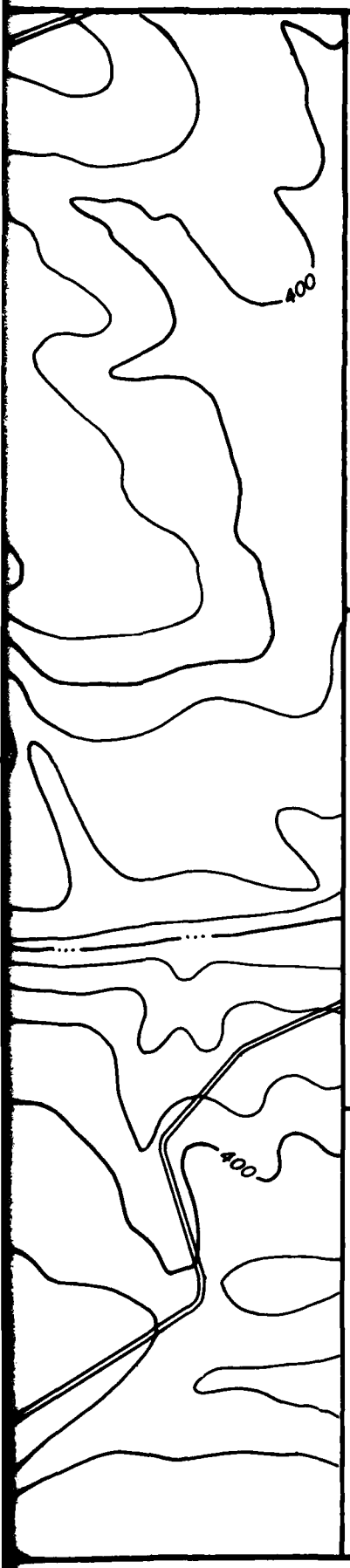
0 800 1600

JANUARY 1971

PLATE 8


STUDY LIMIT
23
SLOTTER RD.
DAM
NO. 6
SWEET BRIAR RD.
22
PRIVATE RD.
SPRUCE LANE
400
21
PRIVATE ROAD
ELEPHANT-DUBLIN RD.
20
CENTER SCHOOL RD.
MATCH LINE PLATE 8
400


STUDY LIMIT
23
SLOTTER RD.
DAM
NO. 6
PRIVATE RD.
400
400
EAST



LEGEND

OVERFLOW LIMITS

STANDARD PROJECT FLOOD

INTERMEDIATE REGIONAL FLOOD

M + 6 MILES ABOVE MOUTH

5 CROSS SECTION

200 GROUND ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM

NOTES:

1. LIMITS OF OVERFLOWS SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
2. MINIMUM CONTOUR INTERVAL IS 20 FEET.

CORPS OF ENGINEERS, U.S. ARMY

PHILADELPHIA DISTRICT

FLOODED AREAS

EAST BRANCH PERKIOMEN CREEK

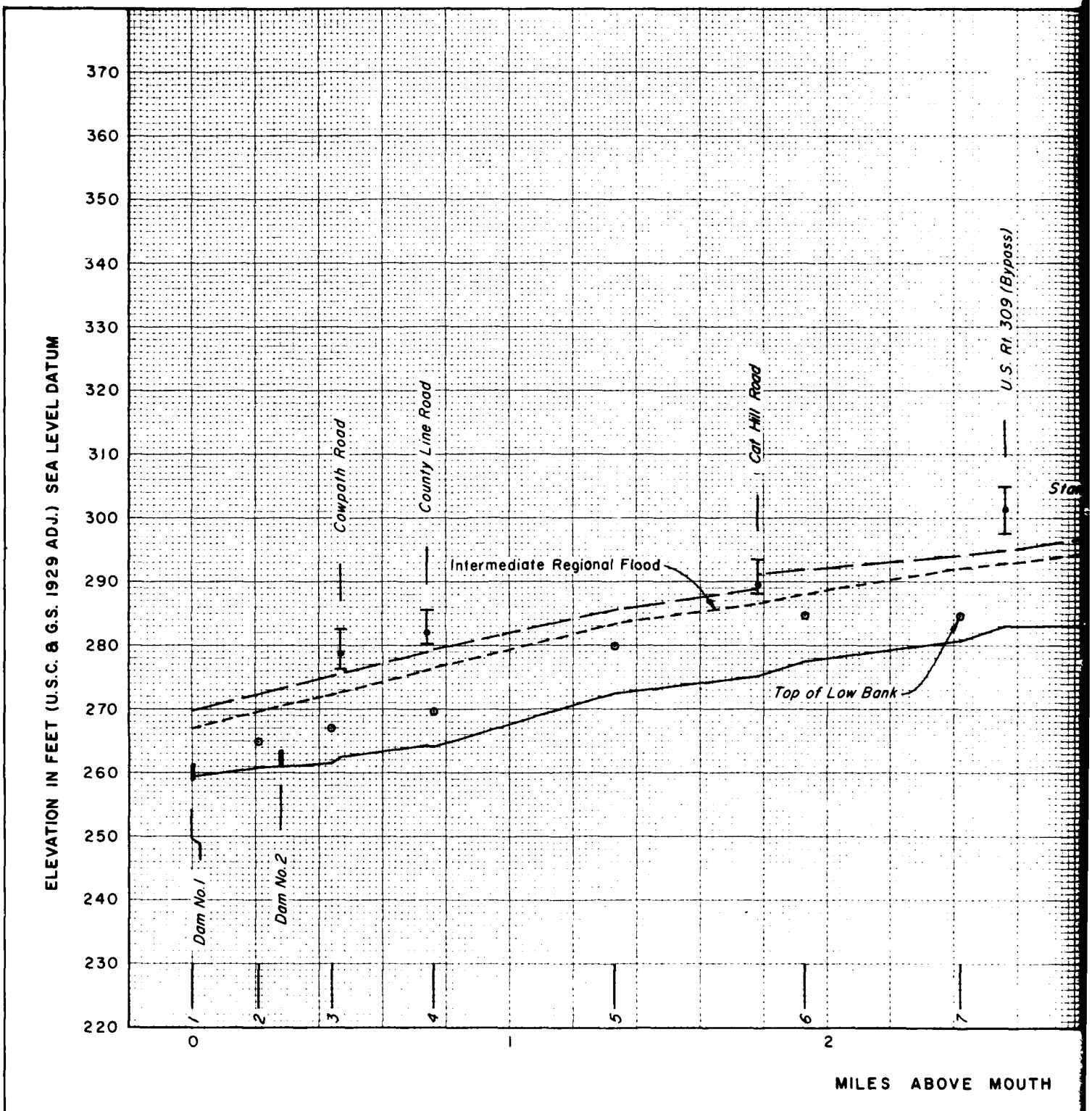
BUCKS COUNTY, PA.

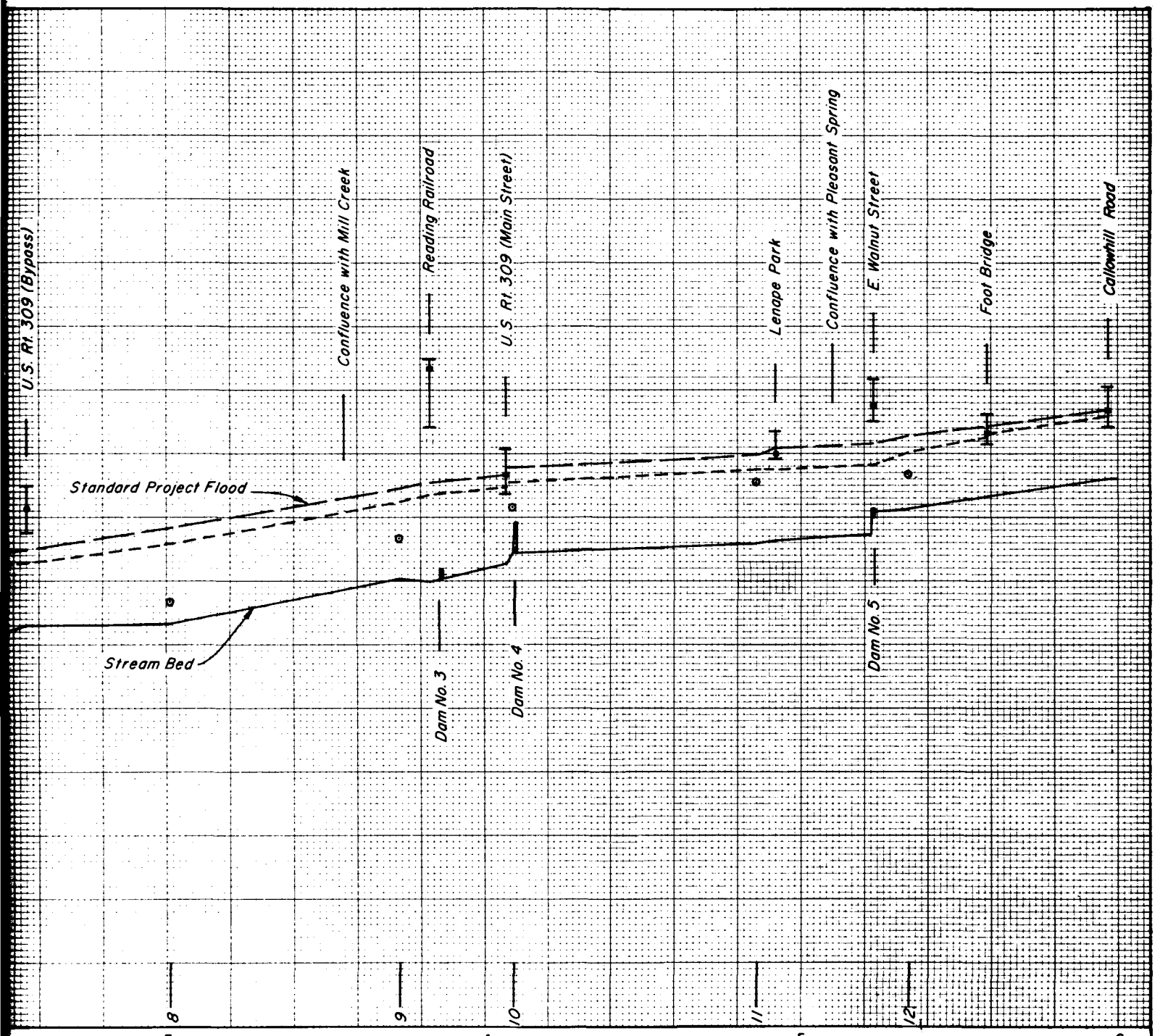
SCALE IN FEET

0 800 1600

JANUARY 1971

PLATE 9


ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
Dam No.1
Dam No.2
Cowpath Road
County Line Road
Cat Hill Road
U.S. Rt. 309 (Bypass)
Intermediate Regional Flood
Top of Low Bank
1
2
3
4
5
6
7
0
1
2
MILES ABOVE MOUTH



MOUTH

LEGEND

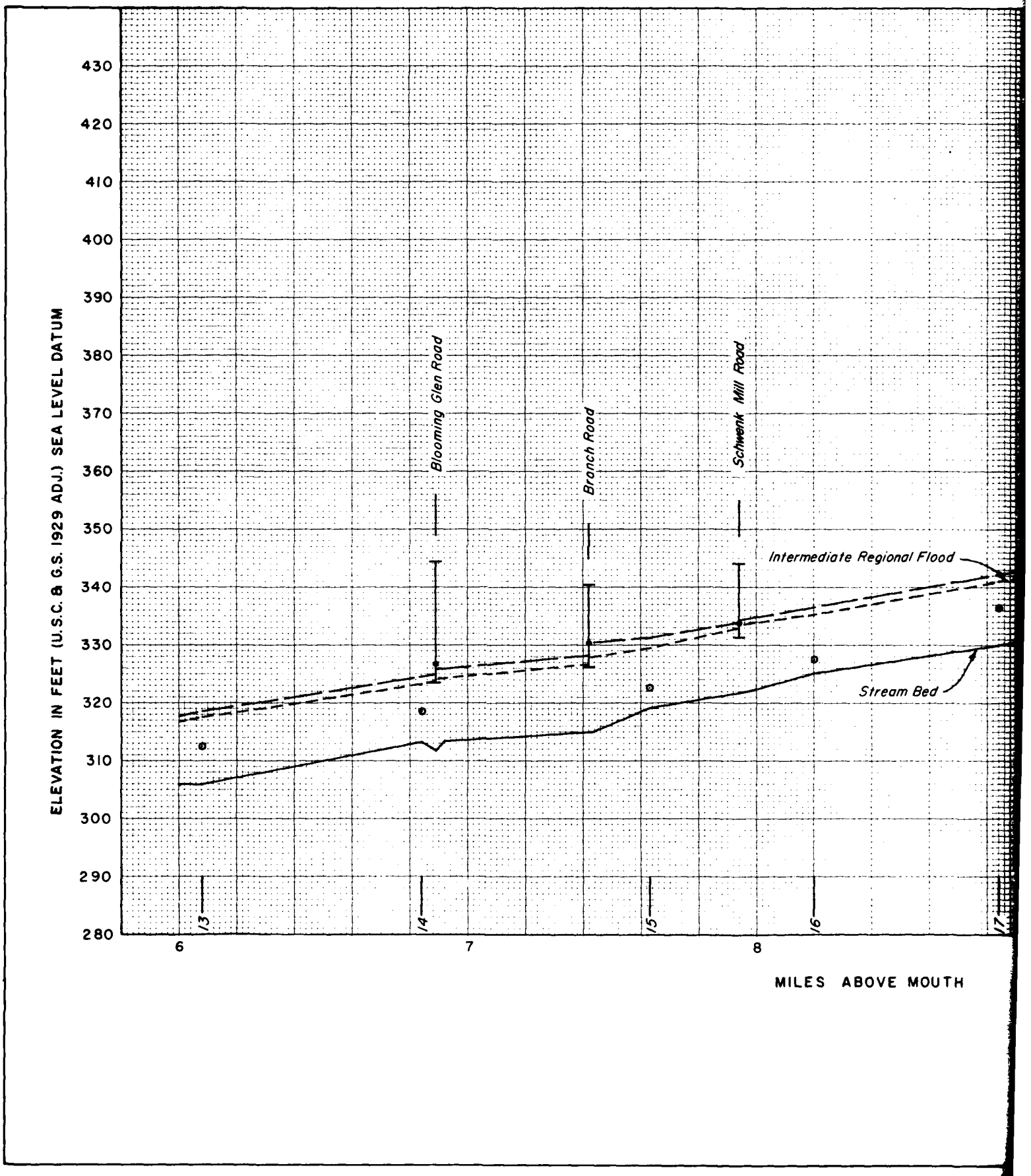
- Top of Bridge Railing
- Underclearance
- Bridge Floor

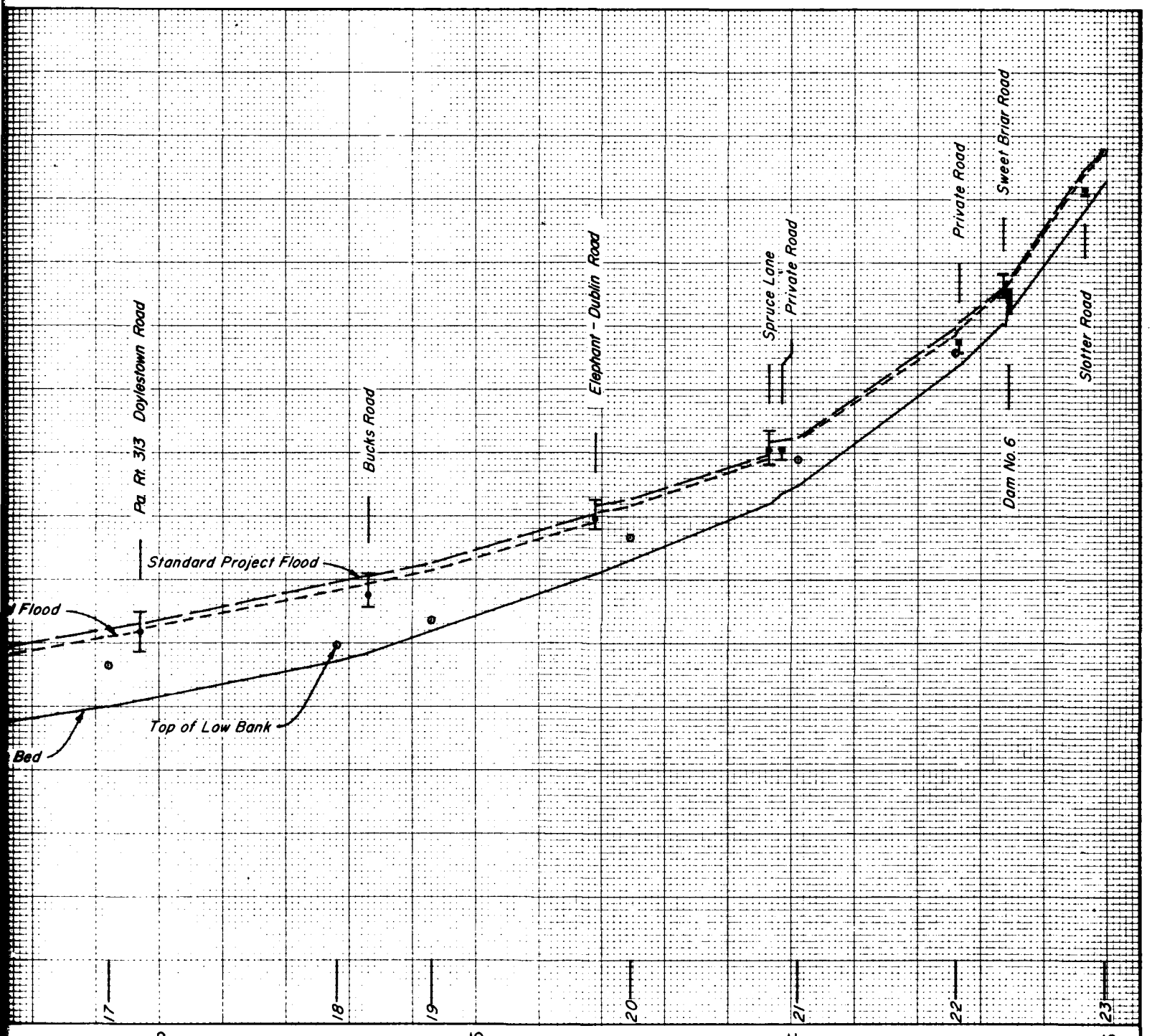
CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT

HIGH WATER PROFILE

EAST BRANCH, PERKIOMEN CREEK
BUCKS COUNTY, PENNSYLVANIA
JANUARY 1971

PLATE 10


ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM
430
420
410
400
390
380
370
360
350
340
330
320
310
300
290
280
Blooming Glen Road
Branch Road
Schwenk Mill Road
Intermediate Regional Flood
Stream Bed
13
14
15
16
17
6
7
8
MILES ABOVE MOUTH



LEGEND

- Top of Bridge Railing
- Underclearance
- Bridge Floor

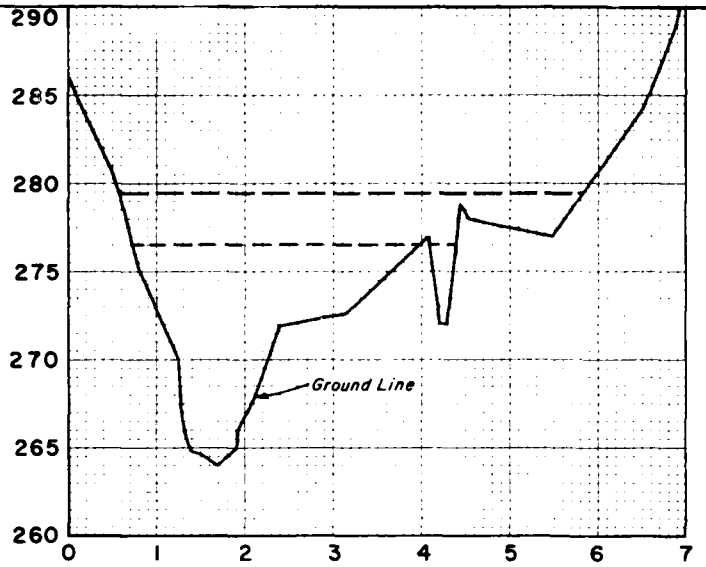
CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT

HIGH WATER PROFILE

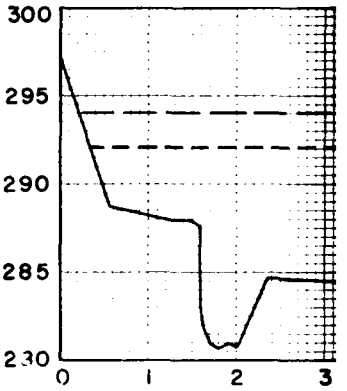
EAST BRANCH, PERKIOMEN CREEK
BUCKS COUNTY, PENNSYLVANIA

JANUARY 1971

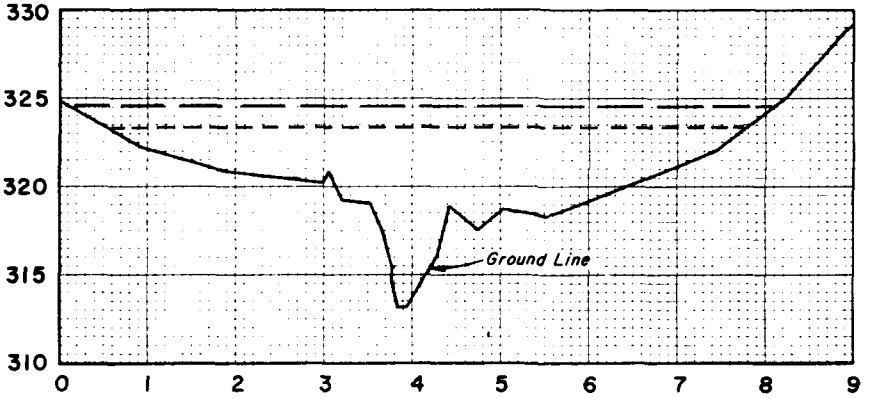
PLATE 11



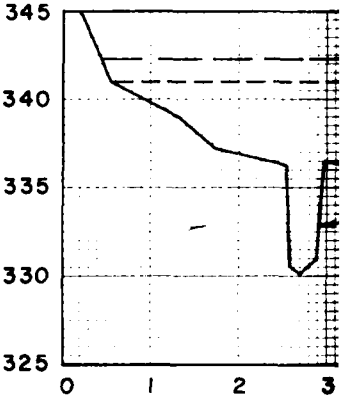
CROSS SECTION NO. 4
MILE 0.76



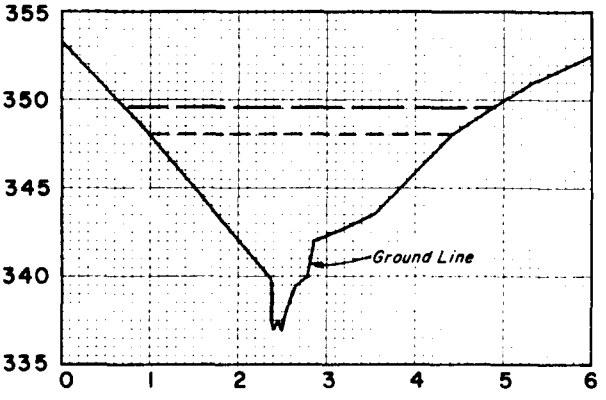
CROS



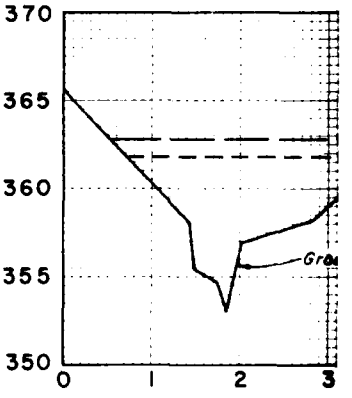
CROSS SECTION NO.14
MILE 6.84



CROS



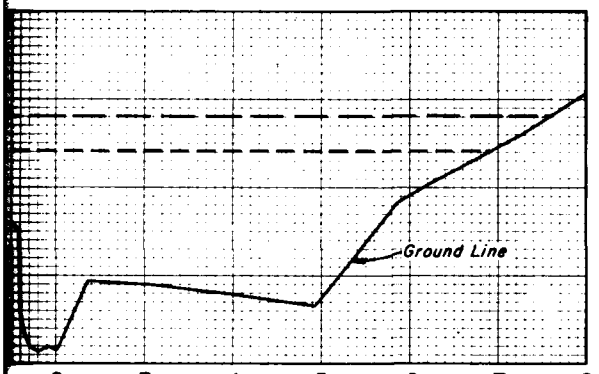
CROSS SECTION NO.18
MILE 9.56



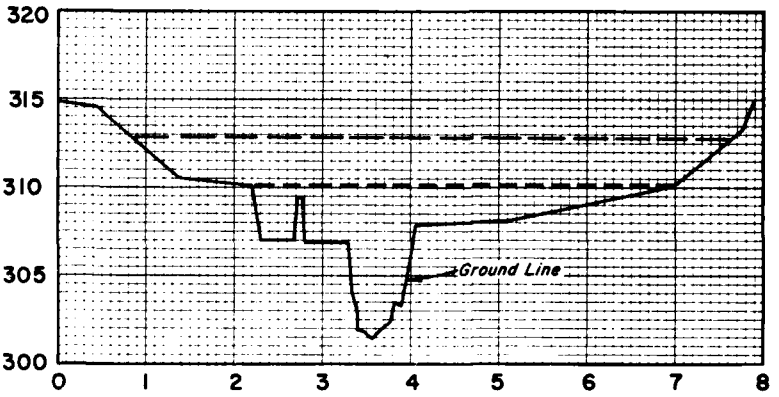
CROSS SECTIO
MILE 10.4

ELEVATION IN FEET (U.S.C. & G.S. 1929 ADJ.) SEA LEVEL DATUM

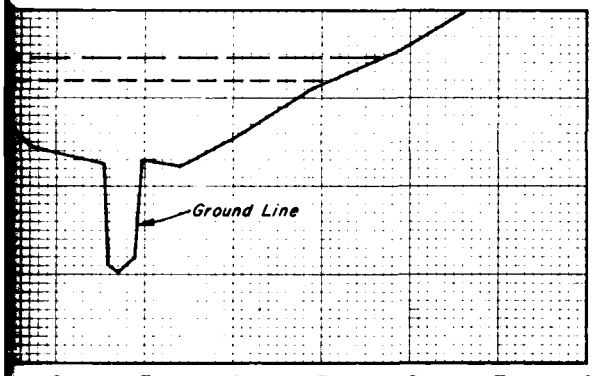
HORIZONTAL DISTANCE IN HUNDREDS OF FEE



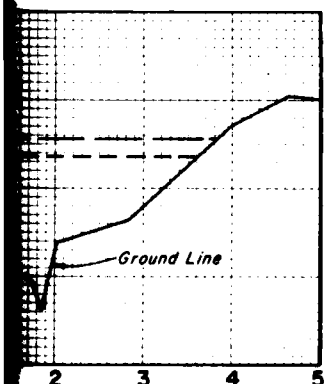
CROSS SECTION NO.7
MILE 2.42



CROSS SECTION NO.12
MILE 5.34



CROSS SECTION NO.17
MILE 8.84



S SECTION NO.20
MILE 10.49

S OF FEET

LEGEND

—— —— Standard Project Flood

– – – – – Intermediate Regional Flood

Sections taken looking downstream

16 Sections not shown

CORPS OF ENGINEERS, U.S. ARMY
PHILADELPHIA DISTRICT

CROSS SECTIONS

EAST BRANCH PERKIOMEN CREEK
BUCKS COUNTY, PENNSYLVANIA
JANUARY 1971

END