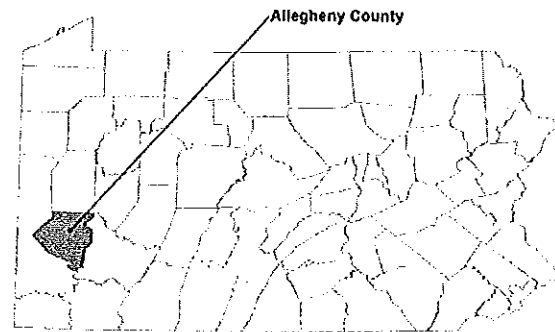


FLOOD INSURANCE STUDY

VOLUME 1 OF 6



ALLEGHENY COUNTY, PENNSYLVANIA (ALL JURISDICTIONS)



COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER	COMMUNITY NAME	COMMUNITY NUMBER
ALEPPO, TOWNSHIP OF	421266	*EAST MCKEESPORT, BOROUGH OF	420029	LINCOLN, BOROUGH OF	420049	ROSSLYN FARMS, BOROUGH OF	420069
ASPENWALL, BOROUGH OF	420005	EAST PITTSBURGH, BOROUGH OF	422652	MARSHALL, TOWNSHIP OF	421080	SCOTT, TOWNSHIP OF	421100
AVALON, BOROUGH OF	420006	*EDGEWOOD, BOROUGH OF	422653	MCCANDLESS, TOWN OF	421081	SEWICKLEY, BOROUGH OF	420070
BALDWIN, BOROUGH OF	420007	EDGEWORTH, BOROUGH OF	420032	MCDONALD, BOROUGH OF	420855	SEWICKLEY HEIGHTS, BOROUGH OF	420071
BALDWIN, TOWNSHIP OF	422650	ELIZABETH, BOROUGH OF	421263	MCKEESPORT, CITY OF	420051	SEWICKLEY HILLS, BOROUGH OF	420072
BELL ACRES, BOROUGH OF	420008	ELIZABETH, TOWNSHIP OF	420033	MCKEES ROCKS, BOROUGH OF	420052	SHALER, TOWNSHIP OF	421101
BELLEVUE, BOROUGH OF	420009	ELMSWORTH, BOROUGH OF	420034	MILLVALE, BOROUGH OF	420053	SHARPSBURG, BOROUGH OF	420073
BEN AVON, BOROUGH OF	420010	ETHA, BOROUGH OF	421062	MONROEVILLE, MUNICIPALITY OF	420054	SOUTH FAYETTE, TOWNSHIP OF	421106
*BEN AVON HEIGHTS, BOROUGH OF	420011	FAWN, TOWNSHIP OF	421265	MOON, TOWNSHIP OF	421082	SOUTH PARK, TOWNSHIP OF	421165
BETHEL PARK, MUNICIPALITY OF	420012	FINDLAY, TOWNSHIP OF	421266	*MOUNT OLIVER, BOROUGH OF	420055	SOUTH VERSAILLES, TOWNSHIP OF	421281
BLAWNOX, BOROUGH OF	420013	*FOREST HILLS, BOROUGH OF	420035	MT. LEBANON, MUNICIPALITY OF	421272	SPRINGDALE, BOROUGH OF	421282
BRACKENRIDGE, BOROUGH OF	420014	FORWARD, TOWNSHIP OF	421064	MUNHALL, BOROUGH OF	420056	SPRINGDALE, TOWNSHIP OF	420074
BRADDOCK, BOROUGH OF	420015	FOX CHAPEL, BOROUGH OF	420036	NEVILLE, TOWNSHIP OF	425385	STOWE, TOWNSHIP OF	421110
*BRADDOCK HILLS, BOROUGH OF	420016	FRANKLIN PARK, BOROUGH OF	420037	NORTH BRADDOCK, BOROUGH OF	420058	SWISSVALE, BOROUGH OF	420075
BRADFORD WOODS, BOROUGH OF	421262	FRAZER, TOWNSHIP OF	421268	NORTH FAYETTE, TOWNSHIP OF	421085	TARENTUM, BOROUGH OF	420076
BRENTWOOD, BOROUGH OF	420017	GLASSPORT, BOROUGH OF	420038	NORTH VERSAILLES, TOWNSHIP OF	421231	THORNBURG, BOROUGH OF	420077
BRIDGEVILLE, BOROUGH OF	420018	GLEN OSBORNE, BOROUGH OF	420061	OAKDALE, BOROUGH OF	420059	TRAFFORD, BOROUGH OF	420093
CARNEGIE, BOROUGH OF	420019	GLENFIELD, BOROUGH OF	420039	OAKMONT, BOROUGH OF	420060	TURTLE CREEK, BOROUGH OF	420079
CASTLE SHANNON, BOROUGH OF	420020	GREEN TREE, BOROUGH OF	420040	OTHARA, TOWNSHIP OF	421088	UPPER ST. CLAIR, TOWNSHIP OF	421119
*CHALFANT, BOROUGH OF	420021	HAMPTON, TOWNSHIP OF	420978	OHIO, TOWNSHIP OF	421089	VERONA, BOROUGH OF	422611
CHESWICK, BOROUGH OF	420022	HARMAR, TOWNSHIP OF	421068	PENN HILLS, MUNICIPALITY OF	421092	VERSAILLES, BOROUGH OF	420081
CHURCHILL, BOROUGH OF	420023	HARRISON, TOWNSHIP OF	420041	*PENNSBURG VILLAGE, BOROUGH OF	422665	WALL, BOROUGH OF	420082
CLARTON, CITY OF	420024	HAYSVILLE, BOROUGH OF	420042	PINE, TOWNSHIP OF	421094	WEST DEER, TOWNSHIP OF	421269
COLLIER, TOWNSHIP OF	421058	HEIDELBURG, BOROUGH OF	420043	PITCAIRN, BOROUGH OF	420062	WEST ELIZABETH, BOROUGH OF	420083
CORAOPOLIS, BOROUGH OF	420025	HOMESTEAD, BOROUGH OF	420044	PITTSBURGH, CITY OF	420063	WEST HOVESTEAD, BOROUGH OF	420084
CRAFTON, BOROUGH OF	420026	INDIANA, TOWNSHIP OF	421070	PLEASANT HILLS, BOROUGH OF	420064	WEST WYFFLIN, BOROUGH OF	420085
CRESCENT, TOWNSHIP OF	421060	*INGRAM, BOROUGH OF	420045	PLUM, BOROUGH OF	420065	*WEST VIEW, BOROUGH OF	420086
*DORMONT, BOROUGH OF	422630	JEFFERSON HILLS, BOROUGH OF	420046	PORT VUE, BOROUGH OF	420066	WHITEHALL, BOROUGH OF	420088
DRAVOSBURG, BOROUGH OF	420027	KENNEDY, TOWNSHIP OF	421072	RANKIN, BOROUGH OF	420067	WHITAKER, BOROUGH OF	420087
DUQUESNE, CITY OF	420028	KILBUCK, TOWNSHIP OF	421073	RESERVE, TOWNSHIP OF	420068	WHITE OAK, BOROUGH OF	420089
EAST DEER, TOWNSHIP OF	421061	LEET, TOWNSHIP OF	421075	RICHLAND, TOWNSHIP OF	421199	WILKINS, TOWNSHIP OF	420090
		LEETSDALE, BOROUGH OF	420047	ROBINSON, TOWNSHIP OF	421097	*WILKINSBURG, BOROUGH OF	422667
		LIBERTY, BOROUGH OF	420048	ROSS, TOWNSHIP OF	420979	WILMERTON, BOROUGH OF	420091



REVISED: September 26, 2014

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER

42003CV001B

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: October 4, 1995

Revised Countywide FIS Dates:

- | | |
|--------------------|--|
| August 5, 1997 | to remove community disclaimer note for the Borough of Trafford and to include the Borough of Trafford into the countywide Flood Insurance Study for Allegheny County, PA. |
| March 16, 1998 | to add Base Flood Elevations, Special Flood Hazard Areas, and road, and road names; and to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations. |
| July 5, 2000 | to change Base Flood Elevations, Special Flood Hazard Areas, and floodways; and to incorporate previously issued Letters of Map Revision. |
| September 21, 2001 | to change Special Flood Hazard Areas and to reflect updated topographic information. |
| May 15, 2003 | to add Special Flood Hazard Areas and Base Flood Elevations and to change Special Flood Hazard Areas and zone designations. |
| September 26, 2014 | to change Base Flood Elevations and Special Flood Hazard Areas, to update corporate limits and roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information. |

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FLOOD INSURANCE STUDY
ALLEGHENY COUNTY, PENNSYLVANIA (ALL JURISDICTIONS)

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Allegheny County, including the Cities of Clairton, Duquesne, McKeesport, and Pittsburgh; the Boroughs of Aspinwall, Avalon, Baldwin, Bell Acres, Bellevue, Ben Avon, Ben Avon Heights, Blawnox, Brackenridge, Braddock, Braddock Hills, Bradford Woods, Brentwood, Bridgeville, Carnegie, Castle Shannon, Chalfant, Cheswick, Churchill, Coraopolis, Crafton, Dormont, Dravosburg, East McKeesport, East Pittsburgh, Edgewood, Edgeworth, Elizabeth, Emsworth, Etna, Forest Hills, Fox Chapel, Franklin Park, Glassport, Glen Osborne, Glenfield, Green Tree, Haysville, Heidelberg, Homestead, Ingram, Jefferson Hills, Leetsdale, Liberty, Lincoln, McDonald, McKees Rocks, Millvale, Mount Oliver, Munhall, North Braddock, Oakdale, Oakmont, Pennsbury Village, Pitcairn, Pleasant Hills, Plum, Port Vue, Rankin, Rosslyn Farms, Sewickley, Sewickley Heights, Sewickley Hills, Sharpsburg, Springdale, Swissvale, Tarentum, Thornburg, Trafford, Turtle Creek, Verona, Versailles, Wall, West Elizabeth, West Homestead, West Mifflin, West View, Whitaker, White Oak, Whitehall, Wilkensburg, and Wilmerding; the Municipalities of Bethel Park, Monroeville, Mt. Lebanon, and Penn Hills; the Town of McCandless; and the Townships of Aleppo, Baldwin, Collier, Crescent, East Deer, Elizabeth, Fawn, Findlay, Forward, Frazer, Hampton, Harmar, Harrison, Indiana, Kennedy, Kilbuck, Leet, Marshall, Moon, Neville, North Fayette, North Versailles, O'Hara, Ohio, Pine, Reserve, Richland, Robinson, Ross, Scott, Shaler, South Fayette, South Park, South Versailles, Springdale, Stowe, Upper St. Clair, West Deer, and Wilkins (referred to collectively herein as Allegheny County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the Borough of McDonald is geographically located in Allegheny, and Washington Counties. The Borough of McDonald is included in its entirety in this FIS report. Please note that the Borough of Trafford is located in Allegheny and Westmoreland Counties. Only the portion of Borough of Trafford located in Allegheny County is included in this FIS. See the separately published FIS reports and Flood Insurance Rate Maps (FIRMs) for countywide map dates and flood hazard information outside of Allegheny County.

Please note that on the effective date of this study, the Boroughs of Ben Avon Heights, Braddock Hills, Chalfant, Dormont, East McKeesport, Edgewood, Forest Hills, Ingram, Mount Oliver, Pennsbury Village, West View, and Wilkinsburg have no mapped Special Flood Hazard Areas (SFHAs). This does not preclude future determinations of SFHAs that could be necessitated by changed conditions affecting the community (i.e. annexation of new lands) or the availability of new scientific or technical data about flood hazards.

Please also note that the Borough of Osborne and Borough of Jefferson have officially changed their names to the Borough of Glen Osborne and Borough of Jefferson Hills, respectively, since the last effective study for Allegheny County.

In some States or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The original October 4, 1995, countywide FIS was prepared to include all jurisdictions within Allegheny County into a countywide format FIS. Information on the authority and acknowledgments for each jurisdiction with a previously printed FIS report included in this countywide FIS is shown below.

Aspinwall, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated June 1979 were prepared by the U.S. Army Corps of Engineers (USACE), Pittsburgh District, for the Federal Insurance Administration (FIA), under Inter-Agency Agreement No. IAA-H-7-76, Project Order No. 25 and No. IAA-H-10-77, Project Order No. 4. That work was completed in June 1978.

Baldwin, Borough of:

The hydrologic and hydraulic analyses for the Monongahela River in the FIS report dated February 1978 were prepared by the USACE, Pittsburgh District. The hydraulic and hydrologic analyses for the remainder of the study were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract

No. H-3812. That work was completed in February 1977.

Bell Acres, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated November 1, 1984, were prepared by Green International, Inc., for the Federal Emergency Management Agency (FEMA), during the course of the preparation of the FIS for the Borough of Economy. That work was completed in October 1979.

Ben Avon, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated January 16, 1981, were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-18-78. That work was completed in February 1980.

Bethel Park, Municipality of:

The hydrologic and hydraulic analyses for the FIS report dated December 15, 1981, were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4816. That work was completed in November 1979.

Blawnox, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, and Amendment No. 1. That work was completed in August 1979.

Brackenridge, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated February 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in June 1979.

Braddock, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement

No. IAA-H-10-77, Project Order No. 21, and Amendment No. 1. That work was completed in March 1979.

Bridgeville, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated July 5, 1983, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40. That work was completed in March 1982.

Carnegie, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated November 1977 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in February 1977.

Cheswick, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated December 1979 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, and Amendment No. 1. That work was completed in June 1979.

Clairton, City of:

The hydrologic and hydraulic analyses for the FIS report dated April 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in June 1978.

Collier, Township of:

The hydrologic and hydraulic analyses for the FIS report dated September 15, 1981, were prepared by GAI Consultants, Inc., for FEMA, under Contract No. H-4762. That work was completed in February 1980.

Coraopolis, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated December 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in November 1977. The hydraulic and hydrologic analyses for the Ohio River were prepared by the USACE.

Crescent, Township of:	The hydrologic and hydraulic analyses for the FIS report dated January 16, 1981, were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-18-78, Project Order No. 29. That work was completed in February 1980.
Dravosburg, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated December 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in January 1978. The hydrologic and hydraulic analyses for the Monongahela River were performed by the USACE.
Duquesne, City of:	The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in March 1978.
East Deer, Township of:	The hydrologic and hydraulic analyses for the FIS report dated February 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in May 1979.
Edgeworth, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated November 1979 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, and Amendment No. 1. That work was completed in January 1979.
Elizabeth, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated January 16, 1981, were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-18-78. That work was completed in January 1980.

Elizabeth, Township of:	The hydrologic and hydraulic analyses for the FIS report dated September 1976 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3727.
Emsworth, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated March 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-7-76, Project Order No. 25, and Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 4. That work was completed in January 1978.
Etna, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated March 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in March 1977. The hydrologic and hydraulic analyses for the Allegheny River were prepared by the USACE, Pittsburgh District.
Fawn, Township of:	The hydrologic and hydraulic analyses for the FIS report dated July 18, 1983, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40. That work was completed in August 1982.
Findlay, Township of:	The hydrologic and hydraulic analyses for the FIS report dated November 18, 1988, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. EM W-85-E-1822, Project Order No. 1, Amendment No. 25. That work was completed in April 1987.
Forward, Township of:	The hydrologic and hydraulic analyses for the FIS report dated August 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in September 1978. The hydrologic and hydraulic analyses for the Township of Forward were previously prepared by the USACE, Pittsburgh District.

Fox Chapel, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated October 15, 1976, were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3727.
Glassport, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated December 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in January 1978. The hydrologic and hydraulic analyses for the Monongahela River were prepared by the USACE, Pittsburgh District.
Glen Osborne, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated May 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in November 1977. The hydrologic and hydraulic analyses for the Ohio River were prepared by the USACE.
Glenfield, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated September 1979 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in January 1979.
Green Tree, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated January 16, 1981, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That work was completed in October 1979.
Hampton, Township of:	The hydrologic and hydraulic analyses for the FIS report dated November 1977 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in February 1977.
Harmar, Township of:	The hydrologic and hydraulic analyses for the FIS report dated January 1980 were

prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in April 1979.

Harrison, Township of:

The hydrologic and hydraulic analyses for the FIS report dated March 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in April 1977.

Haysville, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated September 1979 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in January 1979.

Heidelberg, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated December 15, 1980, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That work was completed in October 1979.

Indiana, Township of:

The hydrologic and hydraulic analyses for the FIS report dated April 18, 1983, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40, Amendment No. 1. That work was completed in May 1982.

Jefferson Hills, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated October 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in September 1978.

Kennedy, Township of:

The hydrologic and hydraulic analyses for the FIS report dated August 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in July 1978.

Kilbuck, Township of:	The hydrologic and hydraulic analyses for the FIS report dated August 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in April 1978.
Leet, Township of:	The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in January 1978.
Leetsdale, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated May 1980 were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in January 1979.
Liberty, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated May 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in March 1978. For the Youghiogheny River, the hydrologic analysis was prepared by the USACE, and the hydraulic analysis was prepared by Michael Baker, Jr., Inc., and completed in December 1976.
Lincoln, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in March 1978. The hydrologic and hydraulic analyses for the Monongahela River were prepared by the USACE.
Marshall, Township of:	The hydrologic and hydraulic analyses for the FIS report dated May 4, 1981, were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in October 1978.

McCandless, Town of:	The hydrologic and hydraulic analyses for the FIS report dated December 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in December 1978.
McDonald, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated February 15, 1983, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40, Amendment No. 1. That work was completed in March 1982.
McKeesport, City of:	The hydrologic and hydraulic analyses for the FIS report dated July 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in July 1977. The hydrologic analyses for the Youghiogheny and Monongahela Rivers were prepared by the USACE. That work was prepared in December 1976.
McKees Rocks, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated May 16, 1977, were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement Nos. IAA-H-19-74 and IAA-H-16-75, Project Order Nos. 18 and 6, respectively.
Millvale, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated January 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in November 1977. The hydrologic and hydraulic analyses for the Allegheny River and Girty's Run were prepared by the USACE.
Monroeville, Municipality of:	The hydrologic and hydraulic analyses for the FIS report dated February 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in November 1977.

- Moon, Township of: The hydrologic and hydraulic analyses for the FIS report dated February 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in March 1978. The hydrologic and hydraulic analyses for the Ohio River were prepared by the USACE.
- Neville, Township of: The hydrologic and hydraulic analyses for the FIS report dated September 5, 1975, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-8-71, Contract No. 8610147. That work was completed in 1975. The hydrologic and hydraulic analyses for the revised FIS report dated September 30, 1988, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. EMW-85-E-1822, Project Order No. 1, Amendment No. 4. That work was completed in January 1987.
- North Fayette, Township of: The hydrologic and hydraulic analyses for the FIS report dated April 18, 1983, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40, Amendment No. 1. That work was completed in March 1982.
- North Versailles, Township of: The hydrologic and hydraulic analyses for the FIS report dated October 1, 1980, were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in September 1978. The hydrologic analyses for the Monongahela River were previously prepared by the USACE, Pittsburgh District.
- Oakdale, Borough of: The hydrologic and hydraulic analyses for the FIS report dated August 15, 1983, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40,

	Amendment No. 1. That work was completed in March 1982.
Oakmont, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated July 16, 1980, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That work was completed in July 1979.
O'Hara, Township of:	The hydrologic and hydraulic analyses for the FIS report dated January 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in April 1979.
Ohio, Township of:	The hydrologic and hydraulic analyses for the FIS report dated November 4, 1988, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. EM W-85-E-1822, Project Order No. 1, Amendment No. 25. That work was completed in March 1987.
Penn Hills, Municipality of:	The hydrologic and hydraulic analyses for the FIS report dated December 15, 1980, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That work was completed in August 1979.
Pitcairn, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated October 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in October 1978.
Pittsburgh, City of:	The hydrologic and hydraulic analyses for the FIS report dated June 15, 1981, were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-16-75, Project Order No. 17, and Inter-Agency Agreement No. IAA-H-7-76, Project Order No. 1. That work was completed in June 1977.

Plum, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated March 16, 1981, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That work was completed in September 1979.
Port Vue, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in March 1978. The hydrologic analysis for the Youghiogheny River was prepared by the USACE. That work was completed in December 1976.
Rankin, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated January 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in March 1979.
Reserve, Township of:	The hydrologic and hydraulic analyses for the FIS report dated October 1976 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3727.
Robinson, Township of:	The hydrologic and hydraulic analyses for the FIS report dated August 3, 1981, were prepared by GAI Consultants, Inc., for FEMA, under Contract No. H-4762. That work was completed in March 1980.
Ross, Township of:	The hydrologic and hydraulic analyses for the FIS report dated June 1979 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-7-76, Project Order No. 16, Amendment No. 2. That work was completed in February 1978.
Rosslyn Farms, Borough of:	The hydrologic and hydraulic analyses for the FIS report dated November 19, 1980, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That

work was completed in October 1979. The hydrologic and hydraulic analyses for Chartiers Creek were prepared by the USACE.

Scott, Township of:

The hydrologic and hydraulic analyses for the FIS report dated November 3, 1981, were prepared by GAI Consultants, Inc., for FEMA, under Contract No. H-4762. That work was completed in January 1980. A portion of the hydrologic and hydraulic analyses for Chartiers Creek was prepared by Michael Baker, Jr., Inc.

Sewickley, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-7-76, Project Order No. 25, and Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 4. That work was completed in October 1977.

Shaler, Township of:

The hydrologic and hydraulic analyses for the FIS report dated September 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in November 1978.

Sharpsburg, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. The hydrologic and hydraulic analyses for the Allegheny River were prepared by the USACE. That work was completed in March 1977.

South Fayette, Township:

The hydrologic and hydraulic analyses for the original FIS report were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4816. That work was completed in February 1980. The hydrologic and hydraulic analyses for the FIS report dated April 3, 1989, were prepared by Kozel and Associates, for

FEMA. That work was completed in December 1987.

South Park, Township of:

The hydrologic and hydraulic analyses for the FIS report dated May 1980 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in May 1979.

South Versailles, Township of:

The hydrologic and hydraulic analyses for the FIS report dated February 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in January 1978.

Springdale, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated January 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in May 1979.

Springdale, Township of:

The hydrologic and hydraulic analyses for the FIS report dated January 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in May 1979.

Stowe, Township of:

The hydrologic and hydraulic analyses for the FIS report dated August 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in July 1978. The hydrologic and hydraulic analyses for the Ohio River were prepared by the USACE, Pittsburgh District.

Tarentum, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated February 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21,

Amendment No. 1. That work was completed in June 1979.

Trafford, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in March 1978.

Turtle Creek, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated May 1980 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in December 1978. The USACE, Pittsburgh District, provided hydrologic and hydraulic design data for detailed study streams.

Upper St. Clair, Township of:

The hydrologic and hydraulic analyses for the FIS report dated September 15, 1983, were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40. That work was completed in March 1982. The hydraulic analysis for Chartiers Creek in the FIS report dated April 17, 1989, was prepared by Kozel and Associates for FEMA. That work was completed in December 1987.

Verona, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated July 16, 1980, were prepared by GAI Consultants, Inc., for the FIA, under Contract No. H-4762. That work was completed in July 1979.

Versailles, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated October 18, 1988, were prepared by the USACE, Pittsburgh District, for FEMA, under Contract No. EMW-85-E-1822, Project Order No. 1, Amendment No. 25. That work was completed in January 1987.

West Deer, Township of:

The hydrologic and hydraulic analyses for the FIS report dated April 18, 1983, were

prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. IAA-H-9-79, Project Order No. 40, Amendment No. 1. That work was completed in May 1982.

West Elizabeth, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. The hydrologic and hydraulic analyses for the Monongahela River were prepared by the USACE, Pittsburgh District. That work was completed in June 1977.

West Homestead, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated February 1980 were prepared by the USACE, Pittsburgh District, for the FIA, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 21, Amendment No. 1. That work was completed in March 1979.

West Mifflin, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated August 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in July 1978. The hydrologic and hydraulic analyses for the Monongahela River were prepared by the USACE, Pittsburgh District.

White Oak, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated March 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-4553. That work was completed in April 1978.

Wilkins, Township of:

The hydrologic and hydraulic analyses for the FIS report dated March 1978 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in April 1977.

Wilmerding, Borough of:

The hydrologic and hydraulic analyses for the FIS report dated February 1979 were prepared by Michael Baker, Jr., Inc., for the FIA, under Contract No. H-3812. That work was completed in November 1977.

There are no previous FISs or FIR Ms for the Boroughs of Avalon, Ben Avon Heights, Brentwood, Bellevue, Braddock Hills, Bradford Woods, Chalfant,

Crafton, Dormont, East McKeesport, East Pittsburg, Edgewood, Forest Hills, Franklin Park, Homestead, Ingram, Mount Oliver, Munhall, North Braddock, Pleasant Hills, Sewickley Hills, Swissvale, Thornburg, Wall, West View, Whitaker, Whitehall, and Wilkinsburg; the Townships of Aleppo, Baldwin, Frazer, Pine, and Richland; and the Municipality of Mt. Lebanon; therefore, the previous authority and acknowledgments for these communities are not included in this FIS.

For the October 4, 1995, countywide FIS, revised hydrologic and hydraulic analyses for the Monongahela River were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. EMW-90-E-3263, Project Order No. 4. That work was completed in October 1992.

For the August 5, 1997, countywide revision, the community disclaimer note for the Borough of Trafford was removed. The borough is now included in this FIS.

For the March 16, 1998, countywide revision, revised hydrologic and hydraulic analyses for Gourthead Run, Harts Run, Little Pine Creek East, Little Pine Creek West, McCaslin Run, Montour Run No. 1, and Pine Creek were prepared by Pinto Engineering, for FEMA, under Contract No. EMW-93-C-4123. That work was completed in October 1993. The Boroughs of Etna and Franklin Park; the Town of McCandless; and the Townships of Hampton, Indiana, O'Hara, Ross, and Shaler were affected by that revision.

For the July 5, 2000, countywide revision, revised hydrologic and hydraulic analyses for the Allegheny River were prepared by the USACE, Pittsburgh District, for FEMA, under Inter-Agency Agreement No. EMW-94-E-4371. This work was completed in October 1997. The Boroughs of Aspinwall, Blawnox, Brackenridge, Cheswick, Etna, Fox Chapel, Millvale, Oakmont, Plum, Sharpsburg, Springdale, Tarentum, and Verona; the Townships of East Deer, Harmar, Harrison, O'Hara, Shaler, and Springdale; the Municipality of Penn Hills and the City of Pittsburgh are affected by the July 5, 2000, revision.

For the September 21, 2001, countywide revision, revised topographic information was prepared by Chester Engineers, Inc., for the Borough of Fox Chapel. The Township of O'Hara was also affected by this revision.

For the May 15, 2003, countywide revision, the hydraulic and hydrologic analyses for Chartiers Creek were performed by the USACE, Pittsburgh District, for FEMA under Inter-Agency Agreement No. (IAA) H-9-79, Project Order No. 40 and Amendment No. 1. This work was completed in October 1982. This revision affects the Boroughs of Crafton, Rosslyn Farms, and Thornburg, and the Township of Robinson.

For this countywide revision the hydrologic and hydraulic analyses were performed by RAMPP, a joint venture of Dewberry, URS Corporation, and ESP,

for FEMA, under Contract No. H SFEHQ-09-D-0369, Project Order No. HSFE03-09-J-003B. This study was completed in September 2010. This revision affects all jurisdictions in Allegheny County.

Base map information shown on the FIRM was provided in digital format by Allegheny County Geographic Information Systems Group. This information was photogrammetrically compiled at a scale of 1:2,400 from aerial photography dated 2004.

The coordinate system used for the production of this FIRM is Pennsylvania State Plane Coordinate System South (FIPS Zone 3702), North American Datum of 1983 (NAD 83) GRS 80 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to State Plane Pennsylvania. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of information shown on the FIRM.

1.3 Coordination

An initial Consultation Coordination Officer's (CCO) meeting is held typically with representatives of FEMA, the community, and the study contractor to explain the nature and purpose of an FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held typically with the same representatives to review the results of the study.

The dates of the pre-countywide initial and final CCO meetings held for the communities within Allegheny County are shown in Table 1, "Initial and Final CCO Dates."

TABLE 1 – INITIAL AND FINAL CCO DATES

<u>Community Name</u>	<u>Initial CCO Date</u>	<u>Final CCO Date</u>
Borough of Aspinwall	April 21, 1976	December 5, 1978
Borough of Baldwin	October 29, 1975	July 19, 1977
Borough of Bell Acres	*	June 11, 1984
Borough of Ben Avon	December 13, 1977	August 13, 1980
Municipality of Bethel Park	May 24, 1978	July 10, 1980
Borough of Blawnox	September 16, 1976	July 16, 1979
Borough of Brackenridge	September 15, 1976	August 30, 1979
Borough of Braddock	September 16, 1976	August 31, 1979
Borough of Bridgeville	January 19, 1979	October 4, 1982
Borough of Carnegie	October 28, 1975	April 25, 1977
Borough of Cheswick	September 15, 1976	July 6, 1979
City of Clairton	May 19, 1977	December 4, 1978
Township of Collier	April 5, 1978	February 3, 1981
Borough of Coraopolis	October 14, 1975	June 21, 1978

*Data not available

TABLE 1 – INITIAL AND FINAL CCO DATES – continued

<u>Community Name</u>	<u>Initial CCO Date</u>	<u>Final CCO Date</u>
Township of Crescent	December 13, 1977	August 25, 1980
Borough of Dravosburg	May 18, 1977	June 22, 1978
City of Duquesne	June 2, 1977	September 13, 1978
Township of East Deer	September 16, 1976	August 30, 1979
Borough of Edgeworth	September 9, 1976	April 11, 1979
Borough of Elizabeth	December 13, 1977	August 13, 1980
Township of Elizabeth	October 22, 1974	October 14, 1975
Borough of Emsworth	April 22, 1976	November 7, 1979
Borough of Etna	October 16, 1975	July 20, 1977
Township of Fawn	December 5, 1978	March 4, 1983
Township of Findlay	May 22, 1985	November 30, 1987
Borough of Fox Chapel	October 23, 1974	October 16, 1975
Borough of Glassport	May 19, 1977	June 22, 1978
Borough of Glen Osborne	October 14, 1975	June 21, 1978
Borough of Glenfield	September 9, 1976	April 11, 1979
Borough of Green Tree	April 5, 1978	August 12, 1980
Township of Hampton	September 16, 1975	April 6, 1977
Township of Harmar	September 16, 1976	July 27, 1979
Township of Harrison	October 14, 1975	July 21, 1977
Borough of Haysville	September 9, 1976	April 11, 1979
Borough of Heidelberg	April 5, 1978	May 13, 1980
Township of Indiana	December 5, 1978	December 1, 1982
Borough of Jefferson Hills	June 1, 1977	May 16, 1979
Township of Kennedy	May 16, 1977	March 15, 1979
Township of Kilbuck	May 16, 1977	October 16, 1978
Township of Leet	May 16, 1977	August 3, 1978
Borough of Leetsdale	September 9, 1976	April 11, 1979
Borough of Liberty	May 19, 1977	October 24, 1978
Borough of Lincoln	May 17, 1977	October 24, 1978
Township of Marshall	May 17, 1977	April 10, 1979
Town of McCandless	May 17, 1977	May 24, 1979
Borough of McDonald	January 17, 1979	October 4, 1982
City of McKeesport	September 18, 1975	September 28, 1977
Borough of McKees Rocks	October 16, 1974	*
Borough of Millvale	October 16, 1975	February 5, 1978
Municipality of Monroeville	October 15, 1975	August 2, 1978
Township of Moon	May 16, 1977	September 11, 1978
Township of Neville	December 14, 1984	November 30, 1987
Township of North Fayette	January 17, 1979	December 2, 1982
Township of North Versailles	May 18, 1977	March 7, 1979
Borough of Oakdale	January 17, 1979	October 4, 1982
Borough of Oakmont	April 5, 1978	March 7, 1980
Township of O'Hara	September 16, 1976	July 16, 1979
Township of Ohio	May 22, 1985	November 30, 1987
Municipality of Penn Hills	April 4, 1978	May 13, 1980
Borough of Pitcairn	May 18, 1977	May 16, 1979

*Data not available

TABLE 1 – INITIAL AND FINAL CCO DATES – continued

<u>Community Name</u>	<u>Initial CCO Date</u>	<u>Final CCO Date</u>
City of Pittsburgh	May 22, 1975	November 9, 1979
Borough of Plum	April 5, 1978	October 21, 1980
Borough of Port Vue	May 19, 1977	September 12, 1979
Borough of Rankin	September 16, 1976	July 17, 1979
Township of Reserve	October 23, 1974	October 16, 1975
Township of Robinson	April 5, 1978	February 3, 1981
Township of Ross	November 18, 1975	December 5, 1978
Borough of Rosslyn Farms	April 5, 1978	May 13, 1980
Township of Scott	April 5, 1978	February 4, 1981
Borough of Sewickley	April 22, 1976	September 11, 1978
Township of Shaler	May 17, 1977	April 12, 1979
Borough of Sharpsburg	October 21, 1975	July 20, 1977
Township of South Fayette	May 25, 1978	February 6, 1981
Township of South Park	May 23, 1978	November 8, 1979
Township of South Versailles	May 18, 1977	August 2, 1978
Borough of Springdale	September 15, 1976	July 18, 1979
Township of Springdale	September 15, 1976	July 18, 1979
Township of Stowe	May 16, 1977	March 6, 1979
Borough of Tarentum	September 15, 1976	August 30, 1979
Borough of Trafford	May 18, 1977	October 24, 1978
Borough of Turtle Creek	May 17, 1977	April 10, 1979
Township of Upper St. Clair	January 19, 1979	March 3, 1983
Borough of Verona	April 5, 1978	March 7, 1980
Borough of Versailles	May 22, 1985	November 30, 1987
Township of West Deer	December 5, 1978	December 1, 1982
Borough of West Elizabeth	September 18, 1975	August 10, 1977
Borough of West Homestead	September 16, 1976	July 17, 1979
Borough of West Mifflin	July 1, 1977	March 7, 1979
Borough of White Oak	May 19, 1977	October 3, 1978
Township of Wilkins	October 15, 1975	August 10, 1977
Borough of Wilmerding	October 21, 1975	August 2, 1978

For the original October 4, 1995, countywide FIS, initial CCO meetings were held during September 1989 and were attended by representatives of the USACE, all jurisdictions within Allegheny County, and FEMA. A final CCO meeting was held on May 23, 1994, and was attended by representatives of the USACE, FEMA, and the Boroughs of Avalon, Bellevue, Crafton, Franklin Park, Homestead, Munhall, North Braddock, and Whitaker.

For the March 16, 1998, countywide revision, initial CCO meetings were held for the communities shown in the following tabulation and were attended by representatives of the respective communities, Pinto Engineering, and FEMA.

<u>Community</u>	<u>Initial CCO</u>
Borough of Etna	April 21, 1993
Borough of Franklin Park	July 26, 1996

<u>Community</u>		<u>Initial CCO</u>
Township of Hampton		April 22, 1993
Township of Indiana	July	26, 1996
Town of McCandless	May	6, 1993
Township of O'Hara	July	26, 1996
Township of Ross	July	26, 1996
Township of Shaler	April	22, 1993

For the July 5, 2000, countywide revision, an initial CCO meeting was held in September 1993 and was attended by representatives of the affected communities, the county, the USACE, and FEMA, and a final CCO meeting was held on April 21, 1998.

For the September 21, 2001 revision, the initial and final CCO meeting dates were not available.

For the May 15, 2003, countywide revision, the final CCO meeting was held on April 29, 2002, and was attended by representatives of the Borough of Thornburg and FEMA.

For this countywide revision, an initial CCO meeting was held on January 26, 2010, and attended by representatives of FEMA Region III, the City of Pittsburgh, Allegheny County, USACE, and RAMPP.

The final CCO meetings were held on September 6 and 7, 2011 and were attended by representatives of FEMA Region III, RAMPP, and representatives of numerous affected communities.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Allegheny County, Pennsylvania.

All or portions of the flooding sources listed in Table 2, "Detailed Studied Streams," were studied by detailed methods. Limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

TABLE 2 – DETAILED STUDIED STREAMS

Abers Creek	Allegheny River	Bear Run
Becks Run	Big Sewickley Creek	Boston Hollow Run
Boyd's Hollow Run	Brush Creek 1	Brush Creek 2
Bull Creek	Campbell's Run	Chalfant Run
Chartiers Creek	Chartiers Creek-Diversion Channel	Crouse Run Tributary
Crooked Run	Crouse Run	Douglass Run
Deer Creek	Dirty Camp Run	East Thompson Run

TABLE 2 – DETAILED STUDIED STREAMS- (continued)

Douglass Run Tributary No. 1	Douglass Run Tributary No. 2	Gillespie Run
Fallen Timber Run	Georges Run	Graesers Run
Girty's Run	Gourdhead Run	Hoffman Run
Happy Hollow Run	Harts Run	Humms Run
Jacks Run	Leak Run	Lewis Run
Lick Run	Little Bull Creek	Little Deer Creek
Little Pine Creek East	Little Pine Creek West	Little Plum Creek
Lobbs Run	Long Run	Lowries Run
McCaslin Run	McClarens Run	McLaughlin Run
Millers Run	Monongahela River	Montour Run
Montour Run No. 1	Moon Run	North Branch
Robinson Run	North Fork Montour Run	Ohio River
Ohio River Back Channel	Painters Run	Peters Creek
Pidgeon Hollow Run	Piersons Run	Pine Creek
Piney Fork	Pitt Street Tributary	Plum Creek
Pucketa Creek	Robinson Run	Rochester Run
Sandy Creek	Saw Mill Run	Sawmill Run
Sandy Creek	Saw Mill Run	Sawmill Run
Scrubgrass Run	South Fork Montour Run	Spring Garden Run
Squaw Run	Squaw Run Tributary No. 1	Squaw Run Tributary No. 2
Squaw Run Tributary No. 4	Streets Run	Thompson Run
Tributary A	Tributary to Bull Creek	Tributary 1 to Piney Fork
Turtle Creek	Unnamed Stream Along	Moss Side Boulevard
West Branch Deer Creek	Whiskey Run	Wittmer Run
Wildcat Run	Wylie Run	Youghiogheny River

The following tabulation lists streams that have names in this countywide FIS other than those used in the previously printed pre-countywide FISs for the communities in which they are located:

<u>Community</u>	<u>Old Name</u>	<u>New Name</u>
Borough of Bridgeville	Chartiers Creek Auxiliary Channel	Chartiers Creek
Township of Elizabeth	Hayden Run	Fallen Timber Run
Borough of Emsworth	Ohio River-Main Channel	Ohio River
Borough of Etna	Little Pine Creek	Little Pine Creek West
Township of Findlay	North Fork Montour Run	Montour Run
Township of Hampton	Montour Run	Montour Run No. 1
Township of Marshall	Brush Creek	Brush Creek 2
Town of McCandless	Little Pine Creek	Little Pine Creek West
Municipality of Monroeville	Turtle Creek at Abers Creek	Turtle Creek
Township of Richland	West Thompson Run Montour Run	Thompson Run Montour Run No. 1

<u>Community</u>	<u>Old Name</u>	<u>New Name</u>
Township of Ross Borough of Trafford	West Little Pine Creek Brush Creek	Little Pine Creek West Brush Creek 1

As part of the October 4, 1995, countywide FIS, updated analyses were included for the Monongahela River for its entire length within the county.

For the March 16, 1998, countywide revision, limits of detailed study for the newly studied or revised streams are shown in the following tabulation.

<u>Stream Name</u>	<u>Limits of Detailed Study</u>
Gourdhead Run	From confluence with Pine Creek to a point approximately 0.6 mile upstream of Harts Run Road
Harts Run	From confluence with Gourdhead Run to a point approximately 350 feet upstream of Harts Run Road
Little Pine Creek East	From confluence with Pine Creek to a point approximately 1,850 feet upstream of Klein Road
Little Pine Creek West	From confluence with Pine Creek to a point approximately 40 feet upstream of Babcock Boulevard
McCaslin Run	From confluence with Gourdhead Run to a point approximately 300 feet upstream of McCully Road
Montour Run No. 1	From confluence with Pine Creek to a point approximately 1.6 mile upstream of Wildwood Road
Pine Creek	From confluence with the Allegheny River to a point approximately 150 feet upstream of Wildwood Road and from a point approximately 0.4 mile downstream of Kummer Road to a point approximately 900 feet upstream of confluence of Fish Run

The March 16, 1998, countywide revision also incorporated changes to the backwater effects of Pine Creek on Crouse Run.

For the July 5, 2000, countywide revision, the Allegheny River was restudied, by detailed methods for its entire length within the county. In addition to backwater

effects from the Allegheny River on Herrs Island Back Channel, Fourteen Mile Island Back Channel, and Twelve Mile Island Back Channel, side channels along the Allegheny River were also studied by detailed methods. Girty's Run, Pine Creek, Sandy Creek, Plum Creek, and Pucketa Creek were also studied.

The July 5, 2000, countywide revision also incorporates the determinations of letters issued by FEMA resulting in map changes (Letter of Map Revision [LOMR]), as shown in the following tabulation.

<u>Community</u>	<u>Flooding Source and Project Identifier</u>	<u>Date Issued</u>
City of Pittsburgh	Allegheny River Updated analyses reflecting the construction of the Garrison Place sewer flap gate, bounded by 9 th and 10 th Streets, Fort Duquesne Boulevard, and Penn Avenue	March 12, 1997
Borough of Oakmont	Tributary to Plum Creek Updated analyses to reflect the channelization of the tributary in the vicinity of Oakmont Common	May 30, 1996
Borough of Oakmont	Plum Creek Updated topographic information from 1,000 feet upstream of CONRAIL bridge to the corporate limit	January 19, 1996

For the September 21, 2001, countywide revision, topographic information was updated for Squaw Run, Squaw Run Tributary Nos. 1, 2, and 4, Glade Run, and Stony Camp Run along their entire lengths. Detailed information was removed along Squaw Run Tributary No. 3.

For May 15, 2003, countywide revision, Chartiers Creek was studied by detailed methods from just upstream of Ingram Boulevard to approximately 300 feet downstream of Chartiers Avenue. This revision affected the Boroughs of Crafton, Rosslyn Farms, and Thornburg, and the Township of Robinson.

For this countywide revision, the majority of SFHAs designated as Zone AE maintained base flood elevations (BFEs) profiles from the previous FIS, with flood areas redelineated to new topography, with the exception of some areas that remain unchanged from the previous FIRM. Portions of Graesers Run, McLaughlin Run, and Plum Creek that were updated through new hydrologic and hydraulic analyses, for the revised detailed study limits, see Table 3, "Scope of Study." The majority of SFHAs designated as Zone A were updated through new hydrologic and hydraulic analyses, with the exception of some areas that remain unchanged from the previous FIRM.

TABLE 3 - SCOPE OF STUDY

Graesers Run	From the confluence with McLaughlin Run to a point approximately 1,720 feet upstream of Brookside Boulevard.
McLaughlin Run	From the confluence with Chartiers Creek to a point approximately 1,330 feet upstream of Bethel Church Road.
Plum Creek	From the confluence with Allegheny River to a point approximately 260 feet upstream of Saltsburg Road.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through Allegheny County.

Numerous streams were studied by approximate analyses. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and Allegheny County.

For this countywide revision, floodplain boundaries for the streams that had been previously studied by detailed methods were redelineated based on more up-to-date topographic data.

This countywide revision incorporates the following Letters of Map Revision (LOMRs) which are listed in Table 4 below.

TABLE 4 -- INCORPORATED LETTERS OF MAP REVISION

<u>Case Number</u>	<u>Effective Date</u>	<u>Flooding Source</u>
00-03-111P	09/22/2000	Thompson Run
00-03-119P	08/07/2000	Peters Creek
02-03-009P	09/04/2002	Lowries Run
02-03-029P	10/15/2002	Sawmill Run
02-03-043P	01/14/2003	Montour Run
02-03-097P	05/17/2002	Montour Run
03-03-011P	02/13/2003	Jacks Run & Long Run
04-03-097P	08/25/2004	Sawmill Run
04-03-113P	12/29/2004	Graesers Run Tributary 1
09-03-0036P	12/31/2008	Unnamed Tributary Along Moss Side Boulevard
11-03-1924P	08/10/2012	Allegheny River

2.2 Community Description

Allegheny County is located in southwestern Pennsylvania. It is bordered by Butler County to the north, Beaver County to the northwest, Washington County to the southwest, Fayette County to the south, and Westmoreland County to the east. The 2010 population of the county was 1,223,348, an increase of 0.4 percent from the 2000 population of 1,218,494, with the largest concentration in the City of Pittsburgh (Reference 1).

The climate of Allegheny County is temperate with seasonal variation in temperature. Temperatures range from an average of 31 degrees Fahrenheit (°F) in January to 74°F in July. The county is geographically located in a region of variable air mass activity, being subject to both polar and tropical continental and maritime air mass invasion. Measurable precipitation occurs approximately 149 days per year and averages 37 inches annually.

Allegheny County lies within the Allegheny Plateau physiographic region. The watersheds are characterized by V-shaped valleys and steep hillsides. Soils are generally silt and silty clay loams and exhibit low infiltration capacities (References 2 and 3).

The Allegheny River, with a total drainage area of 11,778 square miles at its confluence, joins the Monongahela River to form the Ohio River at Pittsburgh, Pennsylvania. The headwaters of the Allegheny River are in the northwestern slopes of the Appalachian Mountain Range in Potter County in northwestern Pennsylvania. It flows in a northwestern direction from its source until it reaches Portville, New York, near the New York-Pennsylvania border. It then flows west to Salamanca, New York, and southward into Pennsylvania to its confluence at Pittsburgh. The Allegheny River measures a total distance of 322 miles. The average bed slope of the Allegheny River is 1.0 foot per mile, and valley floor widths range from 550 to 2,200 feet. Local relief above the stream valley varies from approximately 300 to 400 feet to an average hilltop elevation of approximately 1,200 feet National Geodetic Vertical Datum of 1929 (NGVD 29).

2.3 Principal Flood Problems

Flooding on Abers Creek and its tributary, Humms Run, has been documented extensively in the study titled Urban Development and Small Watershed Flooding prepared by the Turtle Creek Watershed Association, Inc. (Reference 4). Major floods on Abers Creek since 1949, recorded at the USGS gaging station No. 840 near Murrysville, are listed in the following tabulation. Discharges are expressed in cubic feet per second (cfs).

ABERS CREEK AT STATION NO. 840

<u>Date</u>	<u>Stage</u> <u>(feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Discharge</u> <u>(cfs)</u>	<u>Recurrence</u> <u>Interval</u> <u>(years)</u>
July 1950	6.09	942.82	1,600	31
August 1976	7.21	943.94	1,230	15
August 1959	6.98	943.71	1,100	10
June 1952	6.59	943.32	1,000	8
October 1954	6.68	943.41 950		6
June 1972	5.78	942.51 720		

Overbank flooding of the Allegheny River, including the backwater flooding from the Monongahela River, is the principal flooding problem within the study area. The Allegheny and Monongahela Rivers have a history of flooding dating from the 1800s. The highest flood of record occurred in March 1936, the result of flooding on the Allegheny River and backwater flooding from the Monongahela River. This flood was caused by heavy rain and snowmelt from the 16th to the 18th of March. Although the main flood season is normally late winter to early spring, major floods have occurred during the summer or early fall months from the remnants of hurricanes.

The following tabulation shows the most significant floods of record recorded at the Pittsburgh "Point" gage, located at the confluence of the Allegheny and Monongahela Rivers. The stages shown reflect the reductions that were provided by the USACE upstream dams and reservoirs that were in existence at the time of the flood.

FLOODS OF RECORD ON THE ALLEGHENY RIVER
(PITTSBURGH "POINT" GAGE)

<u>Date</u>	<u>Stage</u> ¹ <u>(feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Discharge (cfs)</u>
March 18, 1936	46.0 ²	740.2 ³	557,000
March 15, 1907	38.5 ²	732.7 ³	440,000
December 31, 1942	36.6 ²	730.8 ³	396,000
February 6, 1884	36.3 ²	730.5 ³	403,000
June 23, 1972	35.8 ²	730.0 ³	384,000
March 1, 1902	35.4 ²	729.6 ³	387,000
April 27, 1937	35.1 ²	729.3 ³	351,000
January 20, 1996	34.6 ²	728.8 ³	*

¹Flood stage = 25.0 feet

²Stages prior to operation of all upstream dams

³Gage zero elevation = 694.2 feet, NGVD 29

*Data not computed

FLOODS OF RECORD ON THE ALLEGHENY RIVER
(PITTSBURGH "POINT" GAGE) -- (continued)

<u>Date</u>	<u>Stage¹</u> <u>(feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Discharge (cfs)</u>
January 26, 1937	34.5 ²	728.7 ³	338,000
March 19, 1865	34.4 ²	728.6 ³	370,000
September 28, 1861	34.3 ²	728.5 ³	369,000
February 18, 1891	34.3 ²	728.5 ³	369,000
January 9, 1913	34.3 ²	728.5 ³	369,000

¹Flood stage = 25.0 feet

²Stages prior to operation of all upstream dams

³Gage zero elevation = 694.2 feet, NGVD 29

The following tabulations list the most significant floods of record for the Allegheny River at Lock and Dam No. 2 (at Pittsburgh, River Mile 6.7), Lock and Dam No. 3 (at Acmonia, River Mile 14.5), and Lock and Dam No. 4 (at Natrona, River Mile 24.2), showing the crest stages and elevations that were actually experienced. The recurrence interval at Lock and Dam Nos. 2 and 3 is based on data recorded at Pittsburgh and reflects the natural frequency of each flood, assuming no reductions from any flood control projects; however, the June 1972 crest was estimated to be about 12.1 feet lower than it would have been without the 9 upstream flood-control projects (Reference 5).

ALLEGHENY RIVER AT LOCK AND DAM NO. 2

<u>Date</u>	<u>Stage¹</u> <u>(feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Discharge²</u> <u>(cfs)</u>	<u>Recurrence</u> <u>Interval</u> <u>(years)</u>
March 18, 1936	38.2 ³	748.1 ⁴	360,500	150
December 30, 1942	29.0 ³	738.9 ⁴	251,000	30
January 22, 1959	25.3 ³	735.2 ⁴	224,000	8
March 10, 1964	26.3 ³	736.2 ⁴	218,700	20
January 25, 1937	26.8 ³	736.7 ⁴	214,000	9
April 26, 1937	26.9 ³	736.8 ⁴	210,000	9

¹Stage heights may be slightly higher for lower discharges on the Allegheny River due to the backwater effects from coincident flows on the Monongahela River

²Discharges are computed at Lock and Dam No. 4

³Flood stage (upper gage) = 23.0 feet

⁴Upper gage zero elevation = 709.85 feet

ALLEGHENY RIVER AT LOCK AND DAM NO. 2 (continued)

<u>Date</u>	<u>Stage¹ (feet)</u>	<u>Elevation (feet)</u>	<u>Discharge² (cfs)</u>	<u>Recurrence Interval (years)</u>
March 7, 1945	25.7 ³	735.6 ⁴	207,000	10
June 23, 1972	27.3 ³	737.2 ⁴	207,000	300
January 20, 1996	22.9 ⁵	734.9 ⁶	*	*
March 31, 1940	23.0 ³	732.9 ⁴	187,000	2
January 27, 1952	24.4 ⁵	733.3 ⁴	185,000	6
March 9, 1956	22.3 ⁵	732.2 ⁴	179,000	4

¹Stage heights may be slightly higher for lower discharges on the Allegheny River due to the backwater effects from coincident flows on the Monongahela River

²Discharges are computed at Lock and Dam No. 4

³Flood stage (upper gage) = 23.0 feet

⁴Upper gage zero elevation = 709.85 feet

⁵Flood stage (upper gage) = 20.85 feet

⁶Upper gage zero elevation = 712.0 feet

*Data not computed

ALLEGHENY RIVER AT LOCK AND DAM NO. 3

<u>Date</u>	<u>Stage (feet)</u>	<u>Elevation¹ (feet)</u>	<u>Discharge² (cfs)</u>	<u>Recurrence Interval (years)</u>
March 18, 1936	33.9 ³	756.6 ⁴	360,500	1,000
December 30, 1942	26.1 ³	748.8 ⁴	251,000	100
January 22, 1959	23.9 ³	746.6 ⁴	224,000	50
March 10, 1964	24.2 ³	746.9 ⁴	218,700	45
January 25, 1937	24.3 ³	747.0 ⁴	214,000	35
April 26, 1937	24.4 ³	747.1 ⁴	210,000	*
March 7, 1945	23.5 ³	746.2 ⁴	207,000	*
June 23, 1972	23.7 ³	746.4 ⁴	207,000	30
January 20, 1996	19.1 ⁵	744.9 ⁶	*	*
March 31, 1940	22.0 ³	744.7 ⁴	187,000	*
January 27, 1952	22.0 ³	744.7 ⁴	185,000	*
March 9, 1956	21.7 ³	744.4 ⁴	179,000	*

¹At Borough of Cheswick

²Discharges are computed at Lock and Dam No. 4

³Flood stage (upper gage) = 20.0 feet

⁴Upper gage zero elevation = 722.72 feet

⁵Flood Stage (upper gage) = 16.92 feet

⁶Upper gage zero elevation = 725.8 feet

*Data not available

ALLEGHENY RIVER AT LOCK AND DAM NO. 4

<u>Date</u>	<u>Stage (feet)</u>	<u>Elevation¹ (feet)</u>	<u>Discharge² (cfs)</u>	<u>Recurrence Interval (years)</u>
March 17, 1936	34.0 ^{3,4}	770.7 ⁴	360,500	1,000
December 30, 1942	27.7 ³	764.4 ⁴	251,000	100
January 22, 1959	26.0 ³	762.7 ⁴	224,000	50
March 10, 1964	25.7 ³	762.4 ⁴	218,700	45
January 25, 1937	25.3 ³	762.0 ⁴	214,000	35
April 26, 1937	25.1 ³	761.8 ⁴	210,000	*
March 7, 1945	25.0 ³	761.7 ⁴	207,000	*
June 23, 1972	25.0 ³	761.7 ⁴	207,000	30
March 31, 1940	23.6 ³	760.3 ⁴	187,000	*
January 27, 1952	23.4 ³	760.1 ⁴	185,000	*
March 9, 1956	23.0 ³	759.7 ⁴	179,000	*
January 20, 1996	23.1 ⁵	759.5 ⁶	*	*

¹At Township of East Deer

²Discharges are computed at Lock and Dam No. 4

³Flood stage (upper gage) = 20.0 feet

⁴Upper gage zero elevation = 722.72 feet

⁵Flood stage (upper gage) = 20.3 feet

⁶Upper gage zero elevation = 736.4 feet

*Data not available

Jacks Island, adjacent to the Township of Harrison; Twelvemile Island, located in the Township of Harrison; Sycamore Island, located in the Township of O'Hara; Ninemile Island, located in the Municipality of Penn Hills; Sixmile Island, located in the Borough of Sharpsburg; and Herrs Island, located in the City of Pittsburgh are the only potential obstructions to flow on the Allegheny River.

Neville Island, located in the Township of Neville; Davis Island, located in the Township of Stowe; and Brunot Island, located in the City of Pittsburgh are the only potential obstructions to flow on the Ohio River.

Major floods occurred on Chartiers Creek in 1912, 1915, 1920, 1922, 1936, 1945, 1956, 1961, 1963, and 1966. The flood of record occurred in September 1912 and was estimated by high-water mark comparison by the USACE to have a flow of 20,000 cfs. Since 1916, discharges on Chartiers Creek have been recorded at the U.S. Geological Survey (USGS) gaging station located in Carnegie. The largest discharges recorded at the gaging station were on June 17, 1920; March 6, 1945; and August 6, 1956. The following tabulation shows the peak discharges and elevation at the USGS gage and the approximate recurrence intervals of 7 of the floods recorded at the gaging station (References 6, 7, 8, 9, and 10).

CHARTIERS CREEK AT CARNEGIE GAGE

<u>Date</u>	<u>Stage</u>	<u>(feet)</u>	<u>Elevation¹</u> <u>(feet)</u>	<u>Discharge²</u> <u>(cfs)</u>	<u>Recurrence</u> <u>Interval</u> <u>(years)</u>
September 1912	*		783.0 ²	20,000	100
June 17, 1920	*		* ³	12,800	20
March 6, 1945	*		775.5	12,200	18
August 6, 1956	*		778.4	13,500	26
April 1961	*		773.3	7,180	5
March 1963	*		776.2	10,600	14
February 1966	*		775.9	9,190	9

- ¹Location of Gage:
- a) October 1, 1916 – December 15, 1931: Non-recording gage one-half mile downstream of Hammond Street bridge in the Borough of Carnegie, 8.4 miles upstream from mouth (Datum: Arbitrary)
 - b) January 8, 1932 – September 30, 1933: Non-recording gage one mile downstream of Hammond Street bridge in the Borough of Carnegie, 7.9 miles upstream from mouth (Datum: 757.91 feet)
 - c) November 20, 1941 – August 18, 1967: Water-stage recorded at site 400 feet upstream of Hammond Street bridge, 8.9 miles upstream from mouth (Datum: 762.03 feet)
 - d) August 19, 1967 – September 30, 1971: Non-recording gage at center of right span at downstream side of Hammond Street bridge, 8.9 miles upstream from mouth (Datum: 761.03 feet)
 - e) October 1, 1971 – September 30, 1975: Non-recording gage at site 4.6 miles downstream from Hammond Street bridge, 4.3 miles upstream from mouth (Datum: 725.99 feet)
 - f) October 1, 1975 – Present: Water-stage recorder and concrete weir control on left bank 60 feet downstream from Hammond Street bridge, 8.9 miles upstream from mouth (Datum: 755.45 feet)

²Approximate elevation 400 feet upstream of Hammond Street bridge

³No water-surface elevation for the June 17, 1920, flood is available in the USGS records, since gage datum at that time was arbitrary

*Data not available

The following tabulations show the major floods of record on the Monongahela River as measured at Lock and Dam No. 2 lower gage located in the Borough of Braddock, river mile 11.2, and Lock and Dam No. 3 located just upstream of the Borough of West Elizabeth, at river mile 23.8.

MONONGAHELA RIVER AT LOCK AND DAM NO. 2

<u>Date</u>	<u>Stage</u> <u>(feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Discharge</u> <u>(cfs)</u>	<u>Recurrence</u> <u>Interval</u> <u>(years)</u>
March 1936	*	*	210,000	60
March 16, 1936	46.0	745.3	200,000	*
June 24, 1972	40.8	738.8 ¹	180,000	20
October 16, 1954	41.7	735.7 ²	204,000	40
December 30, 1942	36.3	735.6 ²	150,000	*
November 6, 1985	41.3	735.3 ¹	208,000	*
June 5, 1941	35.7	735.0 ²	201,000	40
April 27, 1937	34.6	733.9	166,000	*
March 7, 1967	39.2	733.2 ¹	178,000	*
October 29, 1937	33.6	732.9	182,000	*
March 7, 1945	33.5	732.8 ²	138,000	*
August 6, 1956	38.6	732.6 ²	105,000	*

Note: Zero datum at the lower gage was 699.25 feet until November 1951
 Zero datum at the lower gage was 694.0 feet from November 1951 to November 1967
 Zero datum at the lower gage was 698.0 feet from November 1967 to October 1988
 Zero datum at the lower gage was 694.0 feet from October 1988 to present
 Lower gage heights are affected by backwater from the Ohio River at Pittsburgh

¹Actual elevations are modified by present reservoir system

²Actual elevations are modified by existing reservoirs at time of flood

*Data not available

MONONGAHELA RIVER AT LOCK AND DAM NO. 3

<u>Date</u>	<u>Stage</u> ¹ <u>(feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Discharge</u> <u>(cfs)</u>	<u>Recurrence</u> <u>Interval</u> <u>(years)</u>
March 18, 1936	32.5 ²	750.8 ³	153,000 ⁴	23 ⁵
June 23, 1972	29.0 ²	746.9 ³	137,000	11
October 16, 1954	28.5 ²	746.4 ³	141,000	14
March 7, 1967	28.3 ²	746.2 ³	158,000	30

¹Stages prior to November 1967 were adjusted to present gage zero

²Upper gage zero elevation = 717.9 feet

³Flood stage (upper gage) = 20.0 feet

⁴Before construction of Tygart Dam and lake

⁵Recurrence intervals for floods occurring prior to flood control measures

MONONGAHELA RIVER AT LOCK AND DAM NO. 3 -- (continued)

<u>Date</u>	<u>Stage¹ (feet)</u>	<u>Elevation (feet)</u>	<u>Discharge (cfs)</u>	<u>Recurrence Interval (years)</u>
June 5, 1941	27.9 ²	745.8 ³	143,000	15
March 5, 1963	26.5 ²	744.4 ³	154,000	25
August 6, 1956	26.1 ²	744.0 ³	133,000	10
October 29, 1937	25.9 ²	743.8 ³	130,500	9 ⁵
May 25, 1968	25.6 ²	743.5 ³	127,000	7
March 25, 1936	25.0 ²	742.9 ³	133,000	10 ⁴
December 30, 1942	24.8 ²	742.7 ³	111,000	4

¹Stages prior to November 1967 were adjusted to present gage zero

²Upper gage zero elevation = 717.9 feet

³Flood stage (upper gage) = 20.0 feet

⁴Before construction of Tygart Dam and lake

⁵Recurrence intervals for floods occurring prior to flood control measures

Ice jams and/or debris collection at hydraulic structures often aggravate flooding along the Monongahela River.

The following tabulations list major floods experienced on the Ohio River.

OHIO RIVER AT EMSWORTH

<u>Date</u>	<u>Stage (feet)</u>	<u>Elevation (feet)</u>	<u>Discharge (cfs)</u>	<u>Recurrence Interval (years)</u>
March 19, 1936	44.4 ¹	723.0 ²	557,000	150
December 31, 1942	37.3 ¹	715.9 ²	396,000 ³	30
June 23, 1972	34.4 ¹	713.0 ²	372,000 ³	230
April 27, 1937	34.0 ¹	712.6 ²	351,000	10
March 7, 1945	33.5 ¹	712.1 ²	343,000 ³	11
January 26, 1937	32.9 ¹	711.5 ²	338,000	9
October 16, 1954	32.8 ¹	711.4 ²	327,000 ³	45
March 11, 1964	31.4 ¹	710.0 ²	313,000 ³	20
January 23, 1937	31.0 ¹	709.6 ²	310,000	6
January 28, 1952	30.4 ¹	709.0 ²	283,000 ³	6
January 23, 1959	30.2 ¹	708.8 ²	275,000 ³	8

¹Flood stage (upper gage) = 26.0 feet

²Upper gage zero elevation = 678.6 feet

³Discharges affected by flood control project

OHIO RIVER AT EMSWORTH

<u>Date</u>	<u>Stage¹ (feet)</u>	<u>Elevation² (feet)</u>	<u>Discharge (cfs)</u>	<u>Recurrence Interval (years)</u>
March 19, 1936	43.0	723.0	557,000	150
December 31, 1942	35.9	715.9	396,000 ³	30
June 23, 1972	33.0	713.0	372,000	230
April 27, 1937	32.6	712.6	351,000	10
March 7, 1945	32.1	712.1	343,000	11
January 26, 1937	31.5	711.5	338,000 ³	9
October 16, 1954	31.4	711.4	327,000 ³	45
March 11, 1964	30.0	710.0	313,000 ³	20
January 23, 1937	31.0	709.8	310,000	6
January 28, 1952	29.0	709.0	283,000 ³	7
January 23, 1959	28.8	708.8	275,000	8

¹Flood stage (upper gage) = 24.6 feet

²Upper gage zero elevation = 680.0 feet

³Discharges affected by flood control projects

OHIO RIVER AT PITTSBURGH GAGE

<u>Date</u>	<u>Stage¹ (feet)</u>	<u>Elevation² (feet)</u>	<u>Discharge (cfs)</u>	<u>Recurrence Interval (years)</u>
March 18, 1936	46.0 ³	740.2	557,000	*
March 15, 1907	38.5 ³	732.7	440,000	*
December 31, 1942	36.6 ³	730.8	396,000	*
February 6, 1884	36.3 ³	730.5	403,000	*
June 23, 1972	35.8 ³	730.0	384,000	*
March 1, 1902	35.4 ⁴	729.6	387,000	*
April 27, 1937	35.1 ³	729.3	351,000	*
January 26, 1937	34.5 ³	728.7	338,000	*
March 19, 1865	34.4 ³	728.6	370,000	*
September 28, 1851	34.3 ³	728.5	369,000	*
February 18, 1891	34.3 ³	728.5	369,000	*
January 9, 1913	34.3 ³	728.5	369,000	*

¹Flood stage = 25.0 feet

²Gage zero elevation = 694.2 feet

³Stages prior to the operation of all the upstream dams

⁴Stage after the operation of all presently operating upstream dams

*Data not available

The following tabulation lists the five largest floods on record for Turtle Creek.

TURTLE CREEK AT EAST PITTSBURGH GAGE

<u>Date</u>	<u>Stage</u> (feet)	<u>Elevation¹</u> (feet)	<u>Discharge</u> (cfs)	<u>Recurrence Interval²</u> (years)
December 30, 1942	*	739.5	9,100	10
May 27, 1946	*	738.6	8,200	8
August 3, 1958	*	735.3	10,500	15
October 15, 1954	*	741.8	12,300	30
June 23, 1972	*	737.1	13,200	45

¹Crest elevations at Cable Avenue (initial damage stage 735.0 feet)

²Determined by flow comparison

*Data not available

Flooding from the Youghiogheny River can occur at any time during the year. From December to April, it is usually the result of snowmelt or spring rains. Flooding from summer storms is also a frequent occurrence on the river. River flooding usually has a duration of several days (Reference 6).

There were three major floods on the Youghiogheny River: March 1936, October 1954, and June 1972. The October 1954 flood was the largest, with a recurrence interval of approximately 100 years and a discharge of 108,000 cfs. The March 1936 flood was approximately a 60-year flood with a discharge of 100,000 cfs. The June 1972 flood had a recurrence interval of approximately 30 years and a discharge of 91,500 cfs. These recurrence intervals are based on the log-Pearson Type III flow-frequency analysis of the flow records at the Suterville gage, located approximately 12 miles upstream. The actual flow of the 1936 flood was compared to the flow-frequency analysis of the presently regulated watershed. High-water marks for the three major floods of the Youghiogheny River in the Borough of Liberty are as follows: March 1936 downstream corporate limits, 748.9 feet, upstream corporate limits, 750.3 feet; October 1954 downstream corporate limits, 744.8 feet, upstream corporate limits 747.6 feet; and June 1972 downstream corporate limits, 744.4 feet, upstream corporate limits, 746.7 feet. High-water marks in the Borough of Port View are as follows: March 1936 downstream corporate limits, 747.6 feet, upstream corporate limits, 748.9 feet; October 1954 downstream corporate limits, 742.5 feet, upstream corporate limits 744.8 feet; and June 1972 downstream corporate limits, 742.8 feet, upstream corporate limits, 744.4 feet (References 6 and 11).

Small streams, such as the following, are sensitive to short storms of high intensity: Abers Creek, Campbell's Run, Georges Run, Gourdhead Run, Humms Run, Little Plum Creek, Long Run, Montour Run, Moon Run, Painters Run, Plum Creek, Pucketa Creek, Sandy Creek, Scrubgrass Run, Whiskey Run, and their tributaries. These storms generally occur during the summer months and may result in overbank flooding along the entire stream. Occasionally, erratic hurricane movement such as that associated with Tropical Storm Agnes, can cause flooding. Local flooding conditions may be worsened by channel constrictions caused by debris, ice, or man-made structures.

Becks Run has overflowed its banks during heavy storms upstream of the Bajo Street bridge in the Borough of Baldwin. Several commercial and residential structures have been affected. Becks Run also affects some residential structures below Bajo Street near the terminus of Somerset Street.

Floods on Big Sewickley Creek are caused primarily by high-intensity storms of short duration. As a result of the short period of record, the only flood on record at the Big Sewickley Creek gage occurred in 1975. The flood had a discharge of 2,540 cfs and a recurrence interval of approximately 10 years.

The flood of June 30, 1974, is the highest known flood to occur on Bull Creek, and caused considerable damage throughout the basin in the Township of Fawn. Several high-water marks were obtained from this flood. Damage from Bull Creek in the Township of Harrison is relatively minor. Debris clogging in a bridge about a half mile downstream, in the Borough of Tarentum, can cause higher flood elevations in the Township of Harrison.

Damage from overflow from Chalfant Run occurs mainly near its confluence with Thompson Run. The Pennsylvania Department of Environmental Resources has issued a survey which includes damages caused by flooding from Chalfant Run during the flood of August 1956 (Reference 8). Eighteen residences were affected, and the total damage was \$27,300 (1969 dollars). Also, hazardous velocities degrade channel banks, especially along several commercial establishments upstream of Baker Street.

On Crooked Run, the worst flood in recent years took place in 1956. Many houses along the stream were heavily damaged by the floodwaters. Crooked Run floods periodically as a result of heavy rains, and these floods can be expected to increase in frequency and severity, because the channel area is gradually being reduced by siltation. Crooked Run flows through a storm culvert along 5th Avenue, in the City of McKeesport, from its inlet at the intersection of Lincoln Way and 5th Avenue to its outlet at the Monongahela River. The entrance to this culvert frequently clogs with debris during storms and, as a result, the floodwaters flow down 5th Avenue instead of entering the culvert. This creates a sheet flow problem along 5th Avenue.

High-water marks provided by the USACE on Crouse Run indicate that the July 1974 flood had approximately a 50-year recurrence interval on Crouse Run.

Davis Run enters a culvert at the upstream side of Ohio River Boulevard (State Route 65) in the Borough of Glen Osborne, between McKown Avenue and the Glen Osborne-Sewickley corporate limits, and flows through it to the Ohio River. As a result of the small size of its opening under Ohio River Boulevard (State Route 65), this culvert clogs easily with debris.

The highest known flood on Deer Creek, West Branch Deer Creek, and Little Deer Creek occurred on June 30, 1974. According to several high-water marks obtained from this flood, the estimated recurrence interval was approximately 50 years. Another high flood in the Deer Creek basin occurred on October 16, 1954.

Flooding on Dirty Camp Run has occurred periodically. The primary problems include basement flooding of approximately 30 commercial buildings and approximately 50 residential properties in the Borough of Pitcairn.

The highest known flood for Girty's Run and Lowries Run occurred in July 1950. The flood was caused by the saturation of ground by preceding rains and the downpour of a storm on the day of the flood (Reference 4). At that time, the discharge recorded for Girty's Run was 6,900 cfs. Damages along Lowries Run occurred mainly to basements, garages, vehicles, and livestock. No high-water marks are available for Lowries Run.

The Township of Hampton experienced one of its first major floods on August 13, 1896, when five people were killed by flooding from Gourdhead Run. Destruction was largely caused by the narrowness of the valley in the area where the Old State Route 8 bridge is now located (Reference 12). The floodplain, because of the construction of the highway, bridges, and buildings, has been altered significantly since this flood.

In the Township of Reserve, Hoffman Run and Spring Garden Run flow through many culverts, some of which constrict flow due to siltation and lack of regular maintenance. Flooding in the streets has occurred many times during periods of intense rainfall. The most recent occurrence of flooding was on February 24, 1975. Spring Garden Road was closed due to flooding, and many homes had flooded basements.

Except for a few scattered residences and residential concentrations, development in the floodplains of Lick Run and Lobbs Run has been minimal in the Borough of Jefferson Hills, resulting in only minor flood problems in the past. There is, however, considerable development along Lewis Run. Damages along this stream could be fairly heavy in the event of a severe flood. The other streams in the borough generally have drainage areas less than five square miles and therefore present only minor flood problems.

The Norfolk and Western Railway culvert causes considerable constriction of the flow on Lick Run in the Borough of Baldwin. This constriction creates serious backwater effects on both Lick Run and Lick Run Tributary upstream of the railroad. Lick Run has also flooded the area immediately downstream of the railroad culvert between Curry Road and Sixth Avenue extending south to North Way. Residential structures on both sides of Sixth Avenue in this area have experienced flooding problems (Reference 13).

Flooding on Little Bull Creek has occurred in October 1954, during Hurricane Hazel, and in July 1974. Although no detailed high-water marks were available for the 1954 flood, local residents stated that the depth of flow was approximately 8 feet, which is approximately bank-full flow (Reference 14). The USACE provided a detailed list of high-water marks on the July 1974 flood. According to these high-water marks, the flood has approximately a 35-year return. Floodplain

development has increased the elevations of large floods in the Birdville section of Little Bull Creek.

In the Borough of Bridgeville and the Township of Upper St. Clair, there are no high-water marks on McLaughlin Run for the September 1912 or August 1956 floods. It is probable that backwater or flooding from Chartiers Creek was responsible for considerable damage along McLaughlin Run. The most recent flood on McLaughlin Run occurred on August 18, 1980. The flood caused some damage to the community and was the result of a short duration, high-intensity storm with rainfall of approximately 3 inches. There is also no high-water information pertaining to this flood.

Major floods occurred on Peters Creek in September 1912, July 1943, October 1954, August 1956, and March 1963. Accurate records for these floods are not available. The August 1969 flood had a recorded discharge of 4,400 cfs and an estimated recurrence interval of 10 years (Reference 15). High-water marks for the August 1969 flood on Peters Creek were recorded at the CONRAIL bridge (739.0 feet), the Ravensburg Boulevard bridge (742.8 feet), and the downstream Borough of Jefferson Hills corporate limits (743.2 feet) (Reference 15). Flood damages have been relatively minimal as very little development has occurred within the floodplain (Reference 15). The constrictive nature of the railroad culvert located just downstream from the State Route 837 bridge results in storage of part of the flood flow in the channel and overbank areas upstream of the culvert. During a flood with a recurrence interval of 100 years or more, flood elevations in this area could reach as high as 758 feet (Reference 15). However, since development in this area has been minimal, damages occurring as a result of such a flood would be relatively minor.

Flooding on Pine Creek occurred in June 1972 during Tropical Storm Agnes, and in July 1974. The July 1974 flood is estimated to be a 10-year flood, according to high-water marks provided by the USACE. The majority of flooding along Little Pine Creek East has occurred in the area of the confluence with Pine Creek. Minimal flooding in recent years has occurred on Girty's Run and Little Pine Creek West. According to residents in the Township of Shaler, damage is to contents rather than structures. The Penn Hills Community Park, located along Plum Creek, was inundated during Tropical Storm Agnes. Other locations along Plum Creek were also damaged by this flood. Tropical Storm Agnes also caused flooding on Sandy Creek. The bridge for the James Volk Water Pollution Control Plant was overtopped. Sandy Creek Road between the bridge and Allegheny River Boulevard (State Route 130) was inundated.

Backwater flooding from large flows on the Allegheny River has affected the downstream reaches of Plum Creek. The storms producing the high river flows, however, do not necessarily cause flooding in the upper portions of Plum Creek. The downstream reach of Pucketa Creek is also subject to backwater flooding from the Allegheny River. Floods on Plum Creek or Pucketa Creek are not systematically recorded. However, high-water marks at 16 locations along Pucketa Creek, for the June 30, 1974, flood were measured by the Pittsburgh District of the USACE. This flood was caused by a localized convection storm.

Precipitation for this storm, measured at Pittsburgh, totaled 1.47 inches in three hours. Based on the high-water marks and the results of this study, the discharge was estimated to be 4,500 cfs which corresponds to a recurrence interval of approximately 50 years.

Flooding on Robinson Run occurred on August 18, 1980. Several high-water marks obtained from this flood indicate it may have been greater than a 10-year flood. Based on high-water data for the Borough of Oakdale, the highest flood on Robinson Run probably occurred in June 1904. Other floods on Robinson Run occurred in July and September 1912, June 1928, and August 1956. There are no high-water data available for Montour Run and its tributaries. According to local residents, however, the highest known flood was that of either July 1943 or July 1950. It is probable that flooding occurred on Montour Run during flooding on Robinson Run.

Several culverts located under commercial establishments on Sawmill Run can clog with debris, causing flow onto Allegheny River Boulevard (State Route 130), which runs along the stream for most of its length. Hazardous velocities caused by the extremely steep bottom slope of this mountain stream cause rapid deterioration during high flow of the channel banks along parts of the stream. Bank degradation is especially significant along Wilbur Avenue near the downstream boundary of the Township of Wilkins.

In May 1950, a flood flow was recorded for Streets Run. This was the only flow ever recorded for that stream and its recurrence interval was less than one in 10 years (Reference 6). The area near the intersection of Streets Run Road and Brentwood Road is susceptible to flooding from Streets Run in the Borough of Baldwin. There are several commercial and residential structures there that have been affected by flooding. Downstream of this area, to the City of Pittsburgh corporate limits, floods have also flowed out-of-banks. Although the stream is out of the Borough of Baldwin's corporate limits in part of this area, the floodplain is wide enough that it extends into the borough (Reference 10). A tributary to Streets Run that originates in Elm Leaf Park and flows in an easterly direction frequently causes problems at the culverts under CSX Transportation and Streets Run Road. Logs, brush, and debris swept downstream from Elm Leaf Park often block up these two culverts and cause both the railroad tracks and Streets Run Road to be inundated. The stream along Brentwood Road that flows easterly to Streets Run occasionally causes problems at the Brentwood Road bridge. The opening to that bridge is sufficiently constricting to cause backup behind the bridge and sheet flooding on Brentwood Road and adjacent areas below the bridge (Reference 13).

The major flooding problem on Thompson Run occurs in the vicinity of the wastewater treatment plant on the upstream side of the CONRAIL tracks. During the flood of June 1972, high flows on the Monongahela River contributed to significant backwater effects on Thompson Run and flooding of the treatment plant. The water-surface elevation during June 1972 was approximately 741 feet at the wastewater plant and there was severe stream bank erosion and inundation of the area around the plant; a monetary estimate of damages is not available.

Flooding in the Municipality of Bethel Park is caused primarily by local, intense, spring and summer thunderstorms. The steep slopes and high degree of urbanization which characterize the area, allow for rapid runoff from these thunderstorms. The resultant flash flooding is compounded by some inadequate storm drainage systems. Debris blockage of small culverts, catch basins, and stream channels causes some impoundment. While these flash floods can cause high channel velocities with resulting scour and bank erosion, the major problems are property and basement flooding (Reference 16). Flooding damage in Bethel Park is usually minor although widespread. It primarily affects landscape and basement contents rather than structures and roadways.

Principal flood problems in the Borough of Coraopolis are caused by overbank flooding from the Ohio River, Montour Run, and McCabe Run, inadequate drainage of McCabe Run Tributary at Maple Street, and storm sewer backup in the low-lying areas.

Throughout the Township of Marshall, local intense summer thunderstorms can cause occasional flash floods. The accompanying high channel velocities result in scouring and erosion. Overbank flooding is primarily the result of debris blockage of the bridge openings and constrictive culverts. The ponding areas created behind these obstructions and floodwaters are usually shallow and can affect areas normally not subject to flooding. This type of flooding affects shallow property and results in basement flooding. Damages from this type of flooding tend to be to property and contents, rather than structural damages. According to local residents, areas prone to this type of flooding are along Brush Creek 2 at Northgate Drive, along Big Sewickley Creek at Warrendale and Ambridge Road, and along Dutihl Road.

In general, watersheds of the Municipality of Monroeville have experienced flood flows which have been increased because of development or denudation in their watersheds.

The principal flood problem in the Townships of Ohio and Ross is the potential for flash flooding.

Flooding is not systematically recorded on Montour Run, Moon Run, Campbells Run, or the smaller streams within the Township of Robinson. However, a flow of 1,170 cfs in July 1974 was recorded by the USGS for Campbells Run through high-water mark comparison (Reference 7). This discharge corresponds to a recurrence interval of approximately 10 years. A discharge measurement of 4,500 cfs was also recorded on Montour Run near Coraopolis on July 5, 1950 (Reference 6). This corresponds to a recurrence interval of approximately five years.

The Borough of Turtle Creek has a history of recorded flooding dating from the early 1900s. The clearing of land because of coal mining, manufacturing, and home-building in the area caused increased storm runoff and siltation of the stream channels. Each spring, the melting of snow and ice combined with heavy

rains caused streams to top their banks and flood businesses, industries, and nearby residences. In the spring of 1907, a devastating flood inundated the entire valley, causing extensive flood damages (Reference 17). In March 1936, the worst flood in the history of the Borough of Turtle Creek occurred, resulting in damages estimated at \$329,000 (1969 dollars) (Reference 11). Another serious flood occurred in October 1954.

The current effective study provided description of historic flood events up to the year 1980. This section provides descriptions of major floods since 1980. There were several flooding occurrences including January 1996, September 2004, and June 2009 with flash flooding and property damages. In recent years flooding has been reported on Bull Creek, Big Sewickley Creek, Brush Creek, Catfish Run, Chartiers Creek, Deer Creek, Fall Run, Flaugherty Run, Girtys Run, Lowries Run, McLaughlin Run, Little Pine Creek and Pine Creek, Plum Creek, Sawmill Run, Flaugherty Run, Piney Fork, Thompson Run and Thorn Run. Flaugherty Run and Thorn Run reported 12 large storm events in last 17 years.

High flow events were observed on Chartiers Creek in November 1985, July 1990, January 1994, September 2004 and January 2005. In September 2004 the highest recorded peak discharge of 27,400 cfs was seen on Chartiers Creek.

On the Youghiogheny River at Sutersville, Pennsylvania the high flooding occurrence was recorded on January 1996. High flood events were recorded on Monongahela River at Elizabeth, Pennsylvania and Braddock, Pennsylvania in January 1986, January 1996 and February 2000.

The USGS gaging station on Little Pine Creek near Etna, Pennsylvania reported high flooding events in May 1986 and September 2004. In May 1986 the highest peak discharge recorded on Little Pine Creek was 7,190 cfs.

At the USGS gaging station on the Allegheny River near Natona, Pennsylvania high flooding events were recorded in January 1996 and September 2004. Along the Ohio River September 2004 was one of the highest flow events in recent years.

There was also flooding in June 2009 flooding along Chalfont Run, Sawmill Run and Thompson Run which caused flooding damages in Wilkins Township.

2.4 Flood Protection Measures

There are twelve upstream flood-control dams and reservoirs operated by the USACE that are effective in reducing flood levels in Allegheny County. Nine of these are in the Allegheny River basin and three are in the Monongahela River basin. Table-5 below, "Flood Control Dams and Reservoirs," presents pertinent data for the dams and reservoirs.

TABLE 5 - FLOOD CONTROL DAMS AND RESERVOIRS

<u>Dam and Reservoir</u>	<u>Miles Upstream From Pittsburgh</u>	<u>Drainage Area (sq. miles)</u>	<u>Date Placed in Operation</u>
ALLEGHENY RIVER BASIN			
Crooked Creek Dam, Crooked Creek Lake	47	277	June 1940
Tionesta Creek Dam, Tionesta Lake	152	478	December 1940
Mahoning Creek Dam, Mahoning Creek Lake	79	340	June 1941
Loyalhanna Creek Dam, Loyalhanna Creek Lake	62	290	June 1942
East Branch Dam, East Branch Clarion River Lake	190	72	June 1952
Conemaugh River Dam, Conemaugh River Lake	65	1,351	November 1953
Kinzua Dam, Allegheny Reservoir	198	2,180	January 1967
Union City Dam, Union City Reservoir	197	222	October 1970
Woodcock Dam, Woodcock Creek Lake	165	46	February 1974
MONONGAHELA RIVER BASIN			
Tygart Dam, Tygart River Lake	152	1,184	February 1938
Youghiogheny River Dam, Youghiogheny River Lake	90	434	March 1948
Stonewall Jackson Dam, Stonewall Jackson Lake	203	102	January 1990

Flood impoundments in the Allegheny River Basin reduce major flood peaks on the Allegheny River at Natrona (Locks and Dam No. 4) by an average of 4 to 8 feet. Together, the dams in the Allegheny River Basin control approximately 5,250 square miles of drainage area or about 45% of the total watershed. These flood impoundments plus those in the Monongahela River Basin reduce major flood peaks at Pittsburgh by an average of 5 to 8 feet. At Monongahela River Lock and Dam No. 2, the Monongahela Reservoirs provide an average reduction of approximately 4 to 5 feet. During the flood of June 23, 1972, this system of reservoirs reduced the flood crest at Pittsburgh by 12.1 feet, preventing a flood almost 2 feet higher than the flood of March 1936, the highest on record.

The effects of the flood flows in the lower part of Becks Run are lessened due to the concrete-lined channel between cross sections A and B. Although this channel has a significant amount of sedimentation in it, it is still sufficient to contain even the most severe flood flow within its walls. The advantages of this

channel are somewhat lessened, however, due to the backwater flooding caused by the Monongahela River.

Chalfant Run is periodically dredged in the reach between the Larimer Avenue intersection with Rodi Road and Baker Street in the Township of Wilkins. This has served to deepen the channel and to clear it of debris. Upstream of this section retaining walls have been constructed in the area of the commercial establishments.

The Chartiers Creek Flood Protection Project was built by the USACE along Chartiers Creek in the vicinity of Carnegie, Heidelberg, and Bridgeville. Flood protection was provided by widening, deepening, and aligning approximately 59,000 feet of Chartiers Creek, deepening approximately 10,700 feet of Chartiers Creek-Diversion Channel, constructing concrete walls and drop structures, and protecting bank slopes with stone riprap. The project was designed to carry the maximum flood of record which occurred on September 2, 1912, with an estimated peak flow of 20,000 cubic feet per second (cfs). If the project had been constructed prior to the 1912 flood, flood elevations would have been approximately 8.5 feet lower within the portions of the studied streams.

The USACE also has installed the Campbells Run flood protection measures as part of the Chartiers Creek Flood Protection Project. In the Borough of Carnegie, a rectangular, concrete channel was constructed from the confluence with Chartiers Creek to the Railroad Street Bridge. Upstream of this bridge, to the Morrow Street Bridge, the channel sides were riprapped.

In 1936 and 1937, the Work Progress Administration constructed retaining walls along the banks of Girty's Run within the Borough of Millvale. In 1952, the Pennsylvania Department of Environmental Resources (formerly Department of Forest and Waters) dredged Girty's Run within the Borough of Millvale.

Portions of Graesers Run, Piney Fork, and Tributary 1 to Piney Fork were cleaned and repaired in 1974 as a flood protection measure (Reference 16).

Lick Run underwent a stream improvement project that was completed in the summer of 1977. The channel was dredged and the overbank areas were altered in the reach of stream below the Norfolk and Western Railway culvert. This project lessened the extent of flooding in the area between Curry Road and Sixth Avenue.

A man-made structure that affects the flood flows of Pine Creek is the North Park Lake Dam. This forms a recreation reservoir located in the Town of McCandless near the border with the Township of Hampton. Since it was designed as a recreation reservoir and controls only about 40 percent of the total drainage area, the attenuation, or lessening, effects on the peak flood flows in the Borough of Etna are small; they amount to approximately a 15-percent reduction on each of the floods considered in this study.

Near the State Route 28 overpass, Pine Creek has been channelized for several thousand feet. This project included a concrete channel and new bridges in this area. The channel provides an efficient conduit for flood flows, and lessens flood heights in this area considerably.

Little Pine Creek West Floodwall (Upstream), in the Borough of Etna, has been provisionally accredited and mapped as providing protection from Little Pine Creek West for the 1-percent-annual-chance flood event. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10. Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

Rapid flood flows on Sawmill Run have necessitated retaining walls at points along the stream to protect the land along the channel. A concrete apron has been constructed near the downstream Township of Wilkins corporate limit at Wilbur Avenue. This serves to reduce channel scour and bank degradation. Also, several debris catches have been constructed to reduce bridge clogging and damage.

From October 1962 to November 1967, the USACE constructed the Turtle Creek Flood Protection Project. This project consists of a concrete channel from the mouth at the Monongahela River to a point approximately 860 feet upstream of the bridge to the Borough of Wall and a dredged, uniformly sloped channel from this point to the confluence with Brush Creek. The design flow of the concrete channel is 20,000 cfs while that of the dredged, uniformly sloped channel is 12,300 cfs, the approximate flow of the flood caused by Tropical Storm Hazel.

The construction of the concrete channel lowered the flood peak elevation of the design flood for Turtle Creek by approximately 10 feet in the Borough of Wilmerding.

Turtle Creek has been periodically dredged in sections downstream of the Municipality of Monroeville; however, these periodic silt removals have had minimal effect on flood levels in Monroeville.

In 1974, the Allegheny County Department of Planning and Development issued the Turtle Creek Watershed Erosion and Sedimentation Control Study (Reference 19). The buildup of sediments represents a continual problem for the Turtle Creek Valley, and this study was intended to serve as a guide for future actions to control soil erosion and sedimentation.

A floodgate is located on Turtle Creek at a point 1.03 miles upstream of its confluence with the Monongahela River. Owned and operated by Westinghouse Corporation, the gate is used to control backwater effects from the Monongahela River. Designed on the 1936 flood and suspended over Turtle Creek and the adjoining access road, the gate, when lowered, has an elevation of 746 feet with 4

feet of freeboard. This enables it to control river backwater effectively up to an elevation of 750 feet.

Since the floodgate is used to control river backwater only, it is closed only after the peak discharge on Turtle Creek has passed, and before the Monongahela River peaks. The remaining Turtle Creek flow is then pumped around the gate to reduce its backwater elevations.

Flooding problems on Thompson Run have been alleviated by the construction of a concrete channel on the lower reaches of the stream. This channel construction, done in conjunction with the Turtle Creek Flood Protection Project, contains both the 500-year flood from Thompson Run and the 500-year backwater from Turtle Creek.

Extensive channel improvements were made on Thompson Run downstream of the Municipality of Monroeville. These improvements, however, will have no effect on flood damage in Monroeville.

The Youghiogheny River is regulated by two reservoirs. Deep Creek Reservoir was constructed in 1925 and controls 65 square miles. It is an earthfill embankment, owned and operated by the Pennsylvania Electric Company, used primarily to produce hydroelectric power. In 1948, the USACE built the Youghiogheny River Dam to regulate the upper 434 square miles of the Youghiogheny River. The dam is a rock-faced earth embankment. Its primary use is flood control and low flow augmentation. Together these dams control 28 percent of the watershed upstream of the Borough of Versailles. During the flood of June 1972, these dams reduced the peak flood elevations in the Borough of Versailles by approximately 1 foot.

In February 1976, the Municipality of Penn Hills enacted a floodplain management ordinance setting forth an administrative procedure for controlling activities in the floodplain (Reference 20). The ordinance establishes standards and provides for legal enforcement of these standards. The standards set forth in the ordinance cover the types of construction materials to be used in flood-prone areas. The installation of electrical and mechanical systems in flood-prone areas is also regulated. Structures to be placed in flood-prone areas are required to have minimal effect on flow. Potential obstructions to flow and/or debris are prohibited.

A flood forecasting and warning system is provided by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service and the USACE to monitor weather conditions and flows in the Allegheny River basin. Emergency operations are coordinated through the Allegheny County Civil Defense Office.

A streambank restoration and stabilization project was undertaken by Allegheny County on Little Pine Creek East in the Township of Shaler, on Gourdhead Run and Harts Run in the Township of Hampton, and on Little Pine Creek West in the Town of McCandless.

In addition to the Up stream Floodwall, there is Mids tream Floodwall and Downstream Floodwall located along Little Pine Creek West before its confluence with Pine Creek. Midstream and Downstream floodwalls are not certified levees and therefore they are not shown as protecting from the base flood on this edition of the FIS.

In Borough of Shaler there is an earthen levee along Pine Creek upstream of confluence with Little Pine Creek East. The levee is not certified and therefore mapped as not providing protection from Pine Creek. In Borough of Etna two retaining walls exist on Pine Creek upstream of confluence with Little Pine Creek West.

FEMA specifies that all levees must have a minimum of 3 foot freeboard against 1-percent annual chance flooding to be considered a safe flood protection structure.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this FIS. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 1-percent annual chance flood (1-percent chance of annual exceedance) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the county at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting Allegheny, County.

Information on the methods used to determine peak discharge-frequency relationships for the streams studied by detailed methods is shown below.