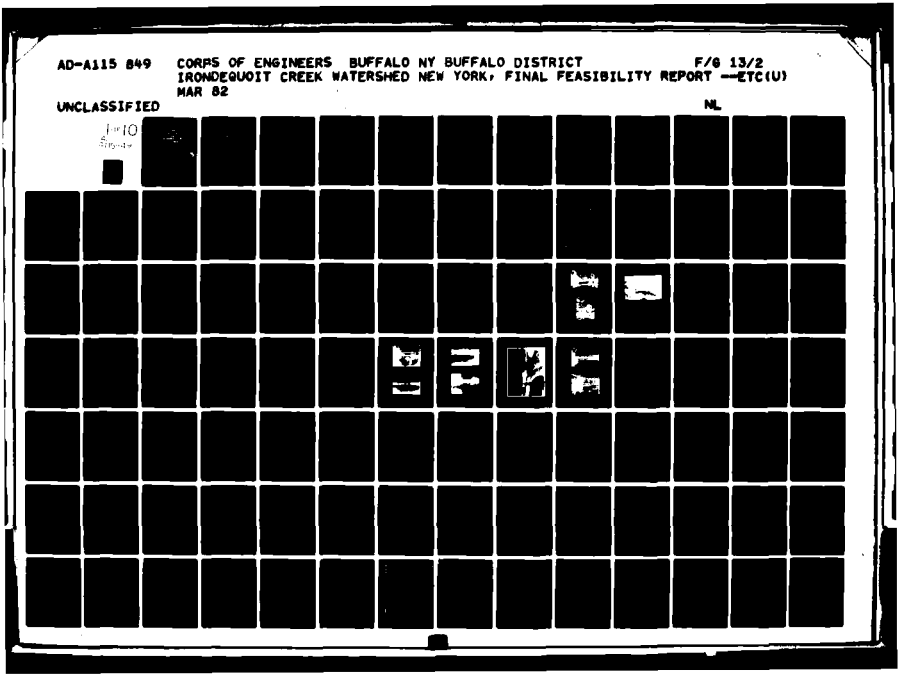
AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL

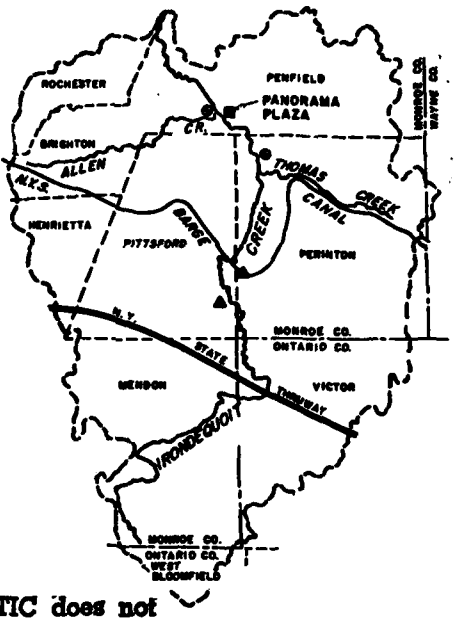


AD A115849

IRONDEQUOIT CREEK WATERSHED

NEW YORK

FINAL FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT



Copy available to DTIC does not permit fully legible reproduction

CORPS OF ENGINEERS
DEPARTMENT OF THE ARMY
BUFFALO DISTRICT
BUFFALO, NEW YORK 14207

MARCH 1982

DTIC FILE COPY

DTIC ELECTE JUN 21 1982 D H

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

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

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A115849	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* Irondequoit Creek Watershed, N.Y. Final Feasibility Report and Environmental Impact Statement		5. TYPE OF REPORT & PERIOD COVERED Final
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. Army Corps of Engineers - Buffalo District		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Engineer District, Buffalo 1776 Niagara Street Buffalo, N.Y. 14207		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Engineer District, Buffalo 1776 Niagara Street Buffalo, N.Y. 14207		12. REPORT DATE March 1982
		13. NUMBER OF PAGES 848
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)*
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Distribution Unlimited

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

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

Flood damage reduction study

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

The Irondequoit Creek Watershed is located in Monroe, Ontario, and Wayne Counties in the central portion of New York State. The watershed drains an area pf approximately 32 miles. The main stem of Irondequoit Creek has a total length of approximately 32 miles. Several smaller creeks are tributary to Irondequoit Creek, with Thomas Creek and Allen Creek being the major tributaries.

Irondequoit Creek has had a recorded history of flooding for more than a hundred years. The increasing urbanization and encroachment into the flood

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

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

plain has increased the flood damage costs in recent years. Twenty floodprone areas in the Irondequoit Creek Watershed were identified in a survey completed in 1968 by the Corps of Engineers, Buffalo District. The 20 floodprone areas were reviewed and evaluated to determine if there was a need or justification for proposing a structural flood control project. No further floodprone areas have been identified since 1968.

The area in the vicinity of Panorama Plaza was the only area recommended for structural flood protection. Seven alternatives for Panorama Plaza were evaluated. Of these, three were considered further. They are: a no action plan, structural alternative (levee/floodwall plan), and a nonstructural plan. The structural alternative was designed and evaluated for 50-year, 100 year, 500 year, and SPF levels of flood protection.

Alternative B was originally selected as the recommended plan. Alternative B is a levee/floodwall plan designed with a selected 500-year level of protection. The plan includes both environmental and recreational enhancement measures.

The remainder of the watershed could be offered flood relief through nonstructural alternatives. The nonstructural alternatives investigated are flood warning, permanent flood plain evacuation, floodproofing, flood insurance and flood plain regulation. An institutional analysis was completed to aid in the selection of a central body to propose, regulate, and enforce the above-mentioned nonstructural techniques.

The non-Federal local sponsor did not provide an adequate Letter of Intent to provide the non-Federal local project assurances for Alternative B. Therefore, the nonstructural plan, with no Corps participation, was selected as the recommended plan.

SYLLABUS

The Irondequoit Creek Watershed is located in Monroe, Ontario, and Wayne Counties in the central portion of New York State. The watershed drains an area of approximately 139 square miles. The main stem of Irondequoit Creek has a total length of approximately 32 miles. Several smaller creeks are tributary to Irondequoit Creek, with Thomas Creek and Allen Creek being the major tributaries.

Irondequoit Creek has had a recorded history of flooding for more than a hundred years. The increasing urbanization and encroachment into the flood plain has increased the flood damage costs in recent years. Twenty flood-prone areas in the Irondequoit Creek Watershed were identified in a survey completed in 1968 by the Corps of Engineers, Buffalo District. The 20 floodprone areas were reviewed and evaluated to determine if there was a need or justification for proposing a structural flood control project. No further floodprone areas have been identified since 1968.

The area in the vicinity of Panorama Plaza was the only area recommended for structural flood protection. Seven alternatives for Panorama Plaza were evaluated. Of these, three were considered further. They are: a no action plan, structural alternative (levee/floodwall plan), and a nonstructural plan. The structural alternative was designed and evaluated for 50-year, 100-year, 500-year, and SPF levels of flood protection.

Alternative B was originally selected as the recommended plan. Alternative B is a levee/floodwall plan designed with a selected 500-year level of protection. The plan includes both environmental and recreational enhancement measures.

The remainder of the watershed could be offered flood relief through nonstructural alternatives. The nonstructural alternatives investigated are flood warning, permanent flood plain evacuation, floodproofing, flood insurance, and flood plain regulation. An institutional analysis was completed to aid in the selection of a central body to propose, regulate, and enforce the above-mentioned nonstructural techniques.

The non-Federal local sponsor did not provide an adequate Letter of Intent to provide the non-Federal project assurances for Alternative B. Therefore, the nonstructual plan, with no Corps participation, was selected as the recommended plan.

DTIC COPY INSPECTED 2

Accession For
NTIS GRA&I ☑
DTIC TAB ☐
Unannounced ☐
Justification
By
Distribution/
Availability Codes
Dist | Avail and/or Special
A-1

IRONDEQUOIT CREEK WATERSHED
NEW YORK
FINAL FEASIBILITY REPORT

TABLE OF CONTENTS

Subject	Page
SYLLABUS	i
THE STUDY AND REPORT	1
General	1
Purpose and Authority	1
Scope of Study	2
Study Participation and Coordination	2
The Report and Study Process	4
Prior Studies and Reports	4
Reports and Studies of Others	5
Previous Projects and Improvements	6
RESOURCES AND ECONOMY OF THE WATERSHED	9
General	9
Environmental Setting and Natural Resources	9
Locality	9
Area Description	9
Geography	9
Regional Geology	10
Groundwater	10
Climatology	12
Environmental Concerns	12
Stream Flow Data	17
Demography and Economy	17
General	17
Population	19
Land Use	20
General	20
Agriculture	20
Commercial	20
Manufacturing	20
Recreation	20
Transportation	21
Power	21
Natural Resources	21
Water Supply	21
Navigation	21

TABLE OF CONTENTS (Cont'd)

Subject	Page
PROBLEMS AND NEEDS	23
General	23
Flood Characteristics	23
Obstructions	23
Urbanization and Encroachment	24
Erosion	24
Notable Past Floods	28
General Floodprone Areas	34
Irondequoit Watershed	34
Irondequoit Creek	34
Thomas Creek	34
Allen Creek	34
Other Unnamed Tributaries	34
Pertinent Floodprone Areas	35
General	35
Ellison Park	35
Panorama Plaza	35
Bushnell Basin	40
Future Floods	41
Water Quality	41
Land Use Management	42
FORMULATING A PLAN	45
General	45
National Objectives	45
National Economic Development (NED)	45
Environmental Quality (EQ)	45
Planning Objectives	46
Evaluation Criteria	46
Technical	46
Economic	47
Environmental	47
Social Well-Being	48
Regional Development	48
Possible Solutions	48
Evaluation of Alternatives	49
General	49
Panorama Plaza Area	49
General	49
Alternative A	49
Alternative B	49
Alternative C	50
Alternative D	52
Alternative E	52
Alternative F	53
Alternative G	53

TABLE OF CONTENTS (Cont'd)

Subject	Page
Recreational Development	59
Remainder of Irondequoit Creek Watershed	62
General	62
No Action	62
Nonstructural	62
General	62
Flood Warning	63
Permanent Flood Plain Evacuation	65
Floodproofing	66
Flood Insurance	67
Flood Plain Regulation	68
Institutional Analysis	71
Selected Plan for Remainder of Watershed	76
Alternatives Considered Further	81
General	81
Descriptions of Alternatives for Panorama Plaza Area	81
Alternative A - No Action	81
Alternative B - Levee/Floodwall	82
Alternative G - Nonstructural	84
Selecting the NED and EQ Plans	94
General	94
National Economic Development (NED) Plan	94
Environmental Quality (EQ) Plan	96
Selected Plan	97
Description	97
Environmental Impacts of Selected Plan	101
General	101
Topography	101
Water Quality	101
Fish and Wildlife	102
Terrestrial Vegetation	103
Wetlands	104
Recreation	104
Cultural Resources	105
Air Quality	105
Displacement or Acquisition	105
Employment and Business	106
Flood Protection	106
Design Considerations of Selected Plan	106
General	106
Geology	107
Structural Design	107
Real Estate	108
Construction	109
Operation and Maintenance	109

TABLE OF CONTENTS (Cont'd)

Subject	Page
ECONOMICS OF THE SELECTED ALTERNATIVE	111
General	111
Methodology	111
Flood Damages	111
Benefits	111
Costs	111
Economic Justification	114
DIVISION OF PLAN RESPONSIBILITIES	115
Federal	115
Non-Federal	115
COST-SHARING POLICY	117
PLAN IMPLEMENTATION	118
COORDINATION WITH OTHER AGENCIES	119
Views of Non-Federal Interests	119
Views of Other Federal Agencies	120
SUMMARY	124
CONCLUSION	125
RECOMMENDATION	126
ENVIRONMENTAL IMPACT STATEMENT	EIS-1-62

TABLE OF CONTENTS (Cont'd)

SKETCHES

Number	Title	Page
1	Location Map	7
2	Watershed Map	8
3	Climatological and Hydrologic Stations	11
4	Damage Areas	30
5	Reservoir Site Location	54
6	Recreational Development	61
7	Flood Plain Management	77
8	Intergovernmental Relationships for Continued Operation	78

TABLES

Number	Title	Page
1	Gaging Stations in Irondequoit Creek Basin	15
2	Peak Discharges at Selected Gaging Stations in the Irondequoit Basin	16
3	Population Characteristics and Population Trends for Towns within the Watershed	18
4	Bridges Across Irondequoit Creek	27
5	Damage Areas in Irondequoit Creek Basin	13-33
6	Reservoir Site Comparison, Available vs. Required Storage	55
7	National Flood Insurance Program	58
8	System of Accounts	95
9	Summary of Benefits and Costs	96
10	Summary of Average Annual Benefits - Selected Plan	112
11	Summary of Annual Costs - Selected Plan	112
12	Summary of Benefits and Costs - Selected Plan	113

PHOTOS

Number	Title	Page
1	Typical Natural Obstruction Across Irondequoit Creek, Mile Point 17.30	25
2	Typical Natural Obstruction Across Irondequoit Creek, Mile Point 17.25	25
3	The New York State Barge Canal Embankment Rises Approximately 55 Feet Above the Ketchum Road Bridge	26
4	Upstream Side at Access Bridge Behind Panorama Plaza During March 1976 Flood	36

TABLE OF CONTENTS (Cont'd)

PHOTOS (Cont'd)

Number	Title	Page
5	Looking North at the Rear of Panorama Plaza During March 1976 Flood	36
6	Looking North at Brookhill Apartments, Spring 1976	37
7	Looking from Old Penfield Road to Brookhill Apartments, Spring 1976	37
8	Gabion Wall on East Bank of Allen Creek, Protecting the Sybron/Nalge Corporation	38
9	View of Downstream Side of Panorama Plaza Extension Road Bridge	39
10	Looking South at Bridge Located on Old Penfield Road During March 1976 Flood	39

PLATES

Number	Title
1	Flood Outlines
2	Alternative B (50-, 100-, and 500-Year)
3	Alternative B (SPF)
4	Alternative C
5	Selected Plan (Alternative B)
6	Internal Drainage
7	Typical Cross Section
8	Typical Cross Section

APPENDICES

A	Cost Estimates
B	Economic
C	Hydraulics and Hydrology
D	Design
E	Geotechnical
F	Pertinent Correspondence and Information
G	Report and Views of Other Agencies
H	: Section 404 Evaluation and Biological Studies and USFWS Coordination Act Report
I	Comment/Response Letters

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

THE STUDY AND REPORT

GENERAL

This section is an introduction describing the content and organization of the report. The study reflects results of flood damage reduction investigations of the Irondequoit Creek Watershed in Monroe, Ontario, and Wayne Counties, NY. Most of the emphasis was placed on providing flood damage reduction measures for the Panorama Plaza area, in addition to a general, basin-wide, nonstructural flood management alternative.

PURPOSE AND AUTHORITY

The purpose of this report is to present the results of the detailed investigations of flood control problems of the Irondequoit Creek Watershed and to determine the need and scope of Federal participation in alleviating such problems.

Congressman Frank J. Horton, 34th New York District, sponsored a resolution through the House of Representatives, Committee on Public Works, authorizing a survey on Irondequoit Creek, NY, and tributaries, including Allen Creek. The authorization is contained in Section 208 of the Flood Control Act of 1965 (Public Law 89-298) adopted 27 October 1965. The resolution reads:

> "The Secretary of the Army is hereby authorized and directed to cause surveys for flood control and allied purposes, including channel and major drainage improvements, and floods aggravated by or due to wind or tidal effects, to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its territorial possessions, which include the localities specifically named in this section. After the regular or formal reports made on any survey authorized by this section are submitted to Congress, no supplemental or additional report or estimate shall be made unless authorized by law except that the Secretary of the Army may cause a review of any examination or survey to be made and a report thereon submitted to Congress, if such review is required by the national defense or by changed physical or economic conditions. . . . Irondequoit Creek, New York and tributaries, including Allen Creek, New York, . . ."

The study area lies mainly in the 34th District of New York, represented by Congressman Frank J. Horton, and a small portion within Districts 33 and 35 represented by Congressman Gary A. Lee and Barber B. Conable, Jr., respectively.

Funds to conduct the initial public meeting, prepare the Plan of Study, the Preliminary Feasibility Report, and for this Final Feasilibity Report were allocated in FY 1975 through FY 1981.

SCOPE OF STUDY

In accordance with U.S. Army Corps of Engineers regulation contained in the ER 1105-2-200 series, the study addresses all known water and land-related needs in the study area and discusses a procedure to mitigate the identified problems. All plans of action were judged on their economic and environmental impacts upon the basin. The scope of the study is limited to Irondequoit Creek and its tributaries, from their point of origin to its termination at Irondequoit Bay. The study was initiated in May 1967 when an initial public meeting was held. The study was temporarily suspended due to a lack of funds from 1968 until 1976. A preliminary field survey of flood damages that occurred during the March 1960 flood was completed by the Buffalo District, Corps of Engineers, in April 1968. The Buffalo District made flood potential evalua-tions for a number of communities under the technical assistance portion of the flood plain management services program. This present study will inves-tigate in detail the Panorama Plaza area in Penfield, NY. Guidelines were established to provide flood relief protection in all other floodprone areas within the Irondequoit Creek Watershed. Economic data and environmental data were included in the report for the evaluation of all considered alternatives.

STUDY PARTICIPATION AND COORDINATION

The initial public meeting for flood damage reduction and allied purposes within the Irondequoit Creek Watershed was held in Rochester on 12 May 1967. The testimony and information provided at that meeting were given by a wide range of Federal, State, county and local agencies, private individuals, and Congressman Frank J. Horton. Only minimal data were obtained at the hearing which described the general conditions of the floodprone areas; explained the desires of the local interests; and delineated some of the needs of the area and what allied purposes for flood management are likely to be pursued.

Coordination was initiated with the various county, town, and other interested agencies located within the watershed. The initial coordination efforts were made to gather existing available data.

A second public meeting was held on 14 June 1976, because of the time lapse since the first meeting held in May 1967. The purposes of this reorientation meeting were to update the available information on the problems and needs in the watershed and inform the public of the renewed activity for the study. The June 1976 meeting was attended by about 50 people and included a cross section of State, county, and local officials, in addition to a number of concerned citizens. Several statements were made that identified a strong desire and need to have informal workshops to coordinate and integrate the desires and interests of all the involved counties, townships, and local concerns. To meet this need, workshops were held early in Stage 2, "Development of Intermediate Plans." The purpose of these workshops were to identify the problems and needs of the watershed, and insure that proposed alternative flood management measures were developed and evaluated on a basin-wide basis. The need for erosion and sedimentation control in the watershed, along with the concern for the natural environment, were also strongly expressed during the meeting.

A public workshop was held on 24 August 1976 with the supervisors of the affected townships, Monroe County, and New York State Department of Environmental Conservation. This was the first of the many planned and anticipated workshops that were held throughout the study. This workshop and others held were important to help better identify problems and needs, and associated alternative solutions for flood control and other water-related needs such as recreation and water quality. The main concern that was established at the workshop was that the need existed for better land management throughout the watershed. The towns are going to take it upon themselves to make sure all affected townships are active in this study and a local township steering committee could be established to help coordinate activities.

Another public meeting was held on 28 April 1977, to update the public on the status of the study. There was also a discussion of flood plain management practices.

A public workshop was held on 30 November 1977, at the Farm and Home Center in Rochester, NY. Flood control measures for Panorama Plaza were discussed. Computer land use modeling and its value to planners were also discussed. Secondary objectives of recreation facilities and water quality were presented.

A public workshop was held on 16 March 1978, in the Henrietta Town Hall, Henrietta, NY. The topics of discussion revolved around the aspects of computer land use modeling. The cost, support, responsibilities, and alternatives of the modeling system were discussed.

A meeting with local interests was held on 28 September 1978, at the town hall in Penfield, NY. The purpose of the meeting was to discuss flood control alternatives for the Panorama Plaza area and computer modeling. Prior to this meeting on computer modeling, several negative responses regarding implementation of computer modeling were received from affected towns and agencies. This eventually led to the elimination of the model study from further consideration.

A Stage 2 public meeting was held on 12 August 1979, at Penfield High School in the town of Penfield, New York. The purpose of the meeting was to discuss the results of the coordinated Preliminary Feasibility Report. The impacts of the proposed alternatives upon the environment and the need for upstream flood plain management planning were major concerns expressed by the public during the meeting.

A workshop was held 20 February 1980 among Corps of Engineers, U. S. Fish and Wildlife and NYS Department of Environmental Conservation (NYSDEC) representatives to discuss environmental concerns in the design of the selected plan.

A workshop was held 4 May 1980 among the Corps of Engineers and the town of Penfield officials to discuss the aspects of the selected plan.

On 15 and 30 April 1981, meetings among NYSDEC (Albany), NYSDEC (Avon), NYSDEC (Cortland), and Corps of Engineers representatives were held to

discuss the items of non-Federal cooperation and maintenance responsibilities. This Final Report was revised to address all of the NYSDEC concerns.

On 29 April 1981, a combined public meeting and Section 404 public hearing was held at Penfield High School. No public comments were made on the proposed Section 404 action. Several comments were made concerning access at the Plaza Extension Bridge, Old Penfield Road Bridge, and the private road to the Genesee Conservation League. The exact details for access will be prepared during the final design stages. Other comments were made concerning the cost-sharing by the non-Federal and the high cost of non-Federal maintenance. The NYSDEC is the local sponsor and will be responsible for determining the non-Federal cost sharing policy. Many of the individuals present expressed concerns on particular design or implementation features, but only two individuals went on record as being opposed to the project. These two individuals have sent a letter summarizing their concerns. The letters with a Corps response are included in Appendix I.

THE REPORT AND STUDY PROCESS

This report describes the resources and economy of the study area; identifies flood-related problems and needs; formulates a full range of possible channel modification alternatives; describes economic, social, and environmental implications of the alternatives; and identifies feasible and economically justified improvements. It also includes, in summary form, the costs and benefits of the various alternatives and the division of project responsibility between Federal and non-Federal interests for the feasible and economically justified improvements. Finally, the report briefly describes the views of non-Federal interests toward flood plain management and the selected flood damage reduction alternative; and presents the findings, conclusions, and recommendations regarding further detailed study under Congressional authorization.

During the study process plans are developed in three stages through an iterative process of four tasks. The initial stage resulted in a plan of study; the intermediate stage defined a broad range of alternative plans to be developed and analyzed, and the final stage involves screening these plans and developing detailed plans as a basis for selection and recommendation. The coordinated plan of study completes the initial study stage. The Preliminary Feasibility Report (PFR) was the product of the intermediate stage. The product of this final stage is the Final Feasibility Report (FFR), which serves as the basis for recommending project construction if a project is found to be economically feasible and environmentally and socially acceptable.

PRIOR STUDIES AND REPORTS

CORPS REPORTS AND STUDIES

The Corps at the request of the New York State Department of Environmental Conservation completed a Flood Plain Information Report for the main stem of Irondequoit Creek in February 1975. The Corps of Engineers completed a Plan

of Survey for Irondequoit Creek which was submitted to North Central Division (NCD) in June 1971 but was not approved due to the lack of sufficient information. The only other study by the Corps was the April 1968 preliminary survey of flood damages for the March 1960 flood. In recent years, the Buffalo District has made flood potential evaluations for a number of discrete locations in the watershed at the request of officials in several communities. This service was performed under the Technical Assistance portion of the Flood Plain Management Service Program. Undoubtedly, the use of these flood hazard data by the involved local governments, with the assistance of the Monroe County Planning Department, will have a positive effect in stabilizing the damage potential in the watershed. There are no known Federal, State, or local flood control projects in the watershed.

The Buffalo District has made extensive engineering studies and prepared various reports for Irondequoit Bay to provide an entrance channel to Lake Ontario for small-craft navigation. Following a number of years of inactivity, the authorized studies (Phase I GDM) for a small-boat harbor in Irondequoit Bay were reinitiated in early 1976. This study has no impact upon the Irondequoit Creek Study.

A coordinated Plan of Study was completed for Irondequoit Creek in September 1976 to begin studies on flood control for the Irondequoit Creek Watershed. It was approved by NCD. A reconnaissance-type report was completed in February 1979, presenting structural flood control alternatives for the Panorama Plaza area within the Irondequoit Creek Watershed. The report was prepared to serve as a vehicle for NCD approval to continue on with Stage 3 investigations of the Panorama Plaza area. In March 1979, a draft Preliminary Feasibility Report (PFR) was completed and sent to the North Central Division office of the Corps of Engineers for review and comments. Upon revision of the report, a revised PFR was sent to agencies, officials, and the public in July 1979, for coordination. In January 1981, a draft of the FFR and DEIS were coordinated with the public.

The New York State Barge Canal is presently being studied by the New York District of the Corps of Engineers in the interest of providing improved navigation facilities.

REPORTS AND STUDIES OF OTHERS

Monroe County, the city of Rochester, and all Monroe County townships within the watershed have developed and prepared various comprehensive planning reports and drainage studies dating from 1960 to the present. The main emphasis in these reports is on existing and future land use, transportation networks, utilities, drainage, solid waste disposal, and human resources. These reports provided valuable data such as soil conditions and geological features to help identify present and future land usage, environmental and recreational needs, drainage patterns, and sewage disposal for potential floodprone areas.

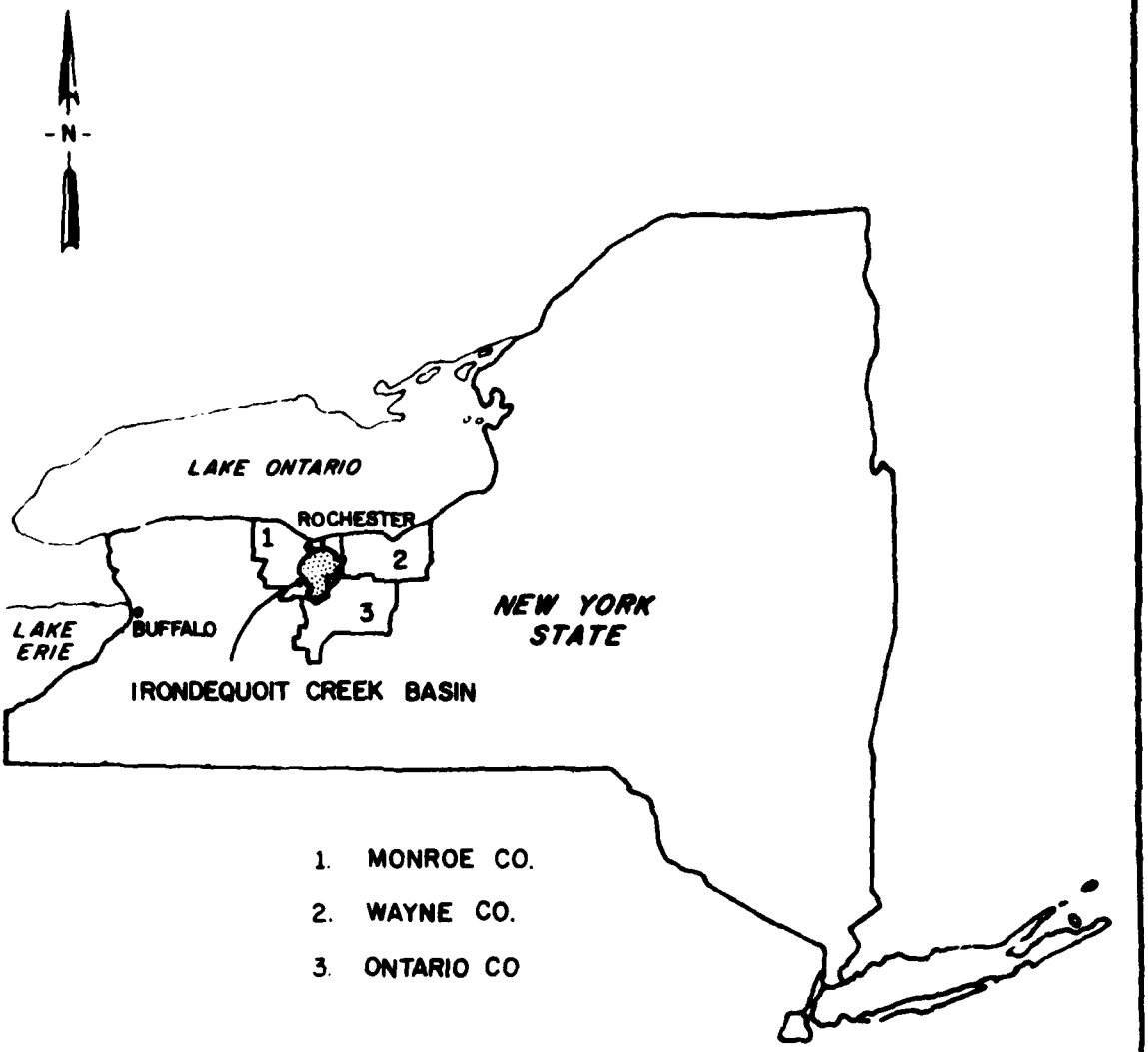
An important aspect considered in the earlier investigation and development of alternative plans is the coordination and utilization of flood insurance study data. Presently, a consultant firm is under contract with the Flood

Insurance Administration to carry out flood insurance studies in the Monroe County area. The towns within the Irondequoit Creek Watershed which are included in the contract are: Brighton, Irondequoit, Penfield, Perinton, Pittsford, and the city of Rochester. The town of Henrietta is being completed by the USGS, and the town of Mendon by another agency. All of the above studies are in various stages of completion.

The Town Engineer for Penfield, NY, is currently conducting a town-wide drainage study. The data gathered was utilized in the interior drainage analysis for the recommended Corps project in the area of Panorama Plaza.

PREVIOUS PROJECTS AND IMPROVEMENTS

There have been no previous Corps of Engineers flood control projects in the Irondequoit Creek Watershed. The only Federal project in the vicinity is an authorized project at Irondequoit Bay to construct a recreational navigation project which is in the advanced engineering and design stage.

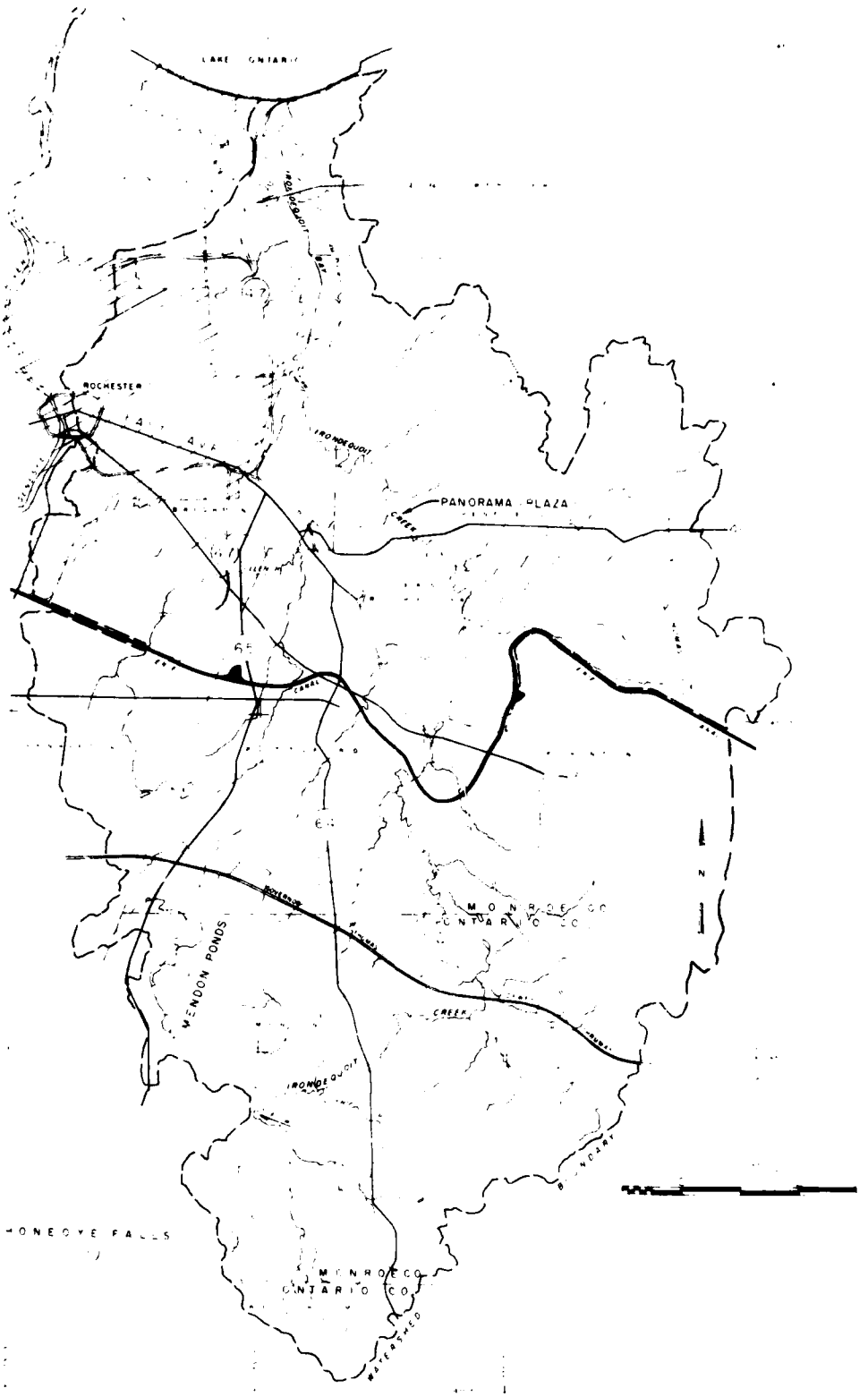


IRONDEQUOIT CREEK WATERSHED
NEW YORK

LOCATION MAP

U.S. ARMY ENGINEER DISTRICT, BUFFALO

SKETCH 1



COMPOSITION OF WATERSHED

MONROE CO. : 120 SQ MILES 87%

ONTARIO CO. : 17 SQ. MILES 12%

WAYNE CO. : 2 SQ. MILES 1%

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

WATERSHED MAP

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

SKETCH 2

RESOURCES AND ECONOMY OF THE WATERSHED

GENERAL

This section presents information that will provide an understanding of: the existing environment; natural and human resources of the study area; the area's development; and the area's economy and trends. The purpose of this section is to provide a frame of reference for subsequent discussions of problems and needs and of alternative solutions together with their effects.

ENVIRONMENTAL SETTING AND NATURAL RESOURCES

LOCALITY

The Irondequoit Creek Watershed is located in Monroe, Ontario, and Wayne Counties in the central portion of New York State. The locality of the basin, southeast of Rochester, NY, is indicated on sketch 1.

AREA DESCRIPTION

Irondequoit Creek Watershed, shown on sketch 2, drains an area of approximately 139 square miles in Monroe, Ontario, and Wayne Counties, NY. About 120 square miles of the drainage area is in Monroe County, about 17 square miles in Ontario County, and the remaining 2 square miles in Wayne County. The headwaters of Irondequoit Creek are in Ontario County about 11 miles WNW of Canandaigua, NY, beginning at an elevation of about 780 feet above mean sea level. Several smaller creeks join Irondequoit Creek as it meanders through a generally narrow gorge about 150-200 feet wide between steep hills from the headwaters and most of its length until entering Lake Ontario through Irondequoit Bay. The main stem of Irondequoit Creek has a total length of approximately 32 miles in a basin about 16.5 miles long and 12 miles wide. Thomas Creek, easterly of Irondequoit Creek, and Allen Creek to the west, are the major tributaries. Allen Creek drains an area of about 31.0 square miles and Thomas Creek an area of about 28.0 square miles. Smaller tributaries are Trout Brook, White Brook, Buckland Creek, and several unnamed streams.

GEOGRAPHY

The Irondequoit Creek Watershed, once primarily rural, has undergone rapid suburban development in recent years. The northern part of the watershed, especially north of the Barge Canal, has developed most rapidly as the Rochester suburban area expands. Sketch 2 shows the boundaries of the watershed, the courses of tributaries, and major influences such as the New York State Barge Canal and Irondequoit Bay.

Irondequoit Creek flows in a meandering course through a hilly and steep-sided valley and is fed by streams and gullies from the hillside and a few wetland areas. Most of the basin, except in populated areas, is heavily vegetated. The Irondequoit Creek valley bed is generally about 200 feet wide. Irondequoit Bay at the mouth is about 1 mile wide between steep-sided slopes. Irondequoit Bay is not within the study area.

REGIONAL GEOLOGY

Physiography - The Irondequoit Creek Watershed consists of the Ontario Lake Plain and the Southern Ontario Plain of the Erie-Ontario Lowland. The two plains are separated by the west-trending Niagara Escarpment which crosses the study area in the vicinity of Allen Creek. Another ridge, the Onondaga Escarpment, crosses the south central portion of the watershed through the villages of Pittsford and Fairport.

The Irondequoit valley exhibits more than 150 feet of relief in parts and is the most striking feature in the watershed. Irondequoit Creek originates in the northwest corner of Ontario County and flows northerly through a fresh water marshland and empties into Irondequoit Bay. Its major tributaries are Allen Creek and Thomas Creek.

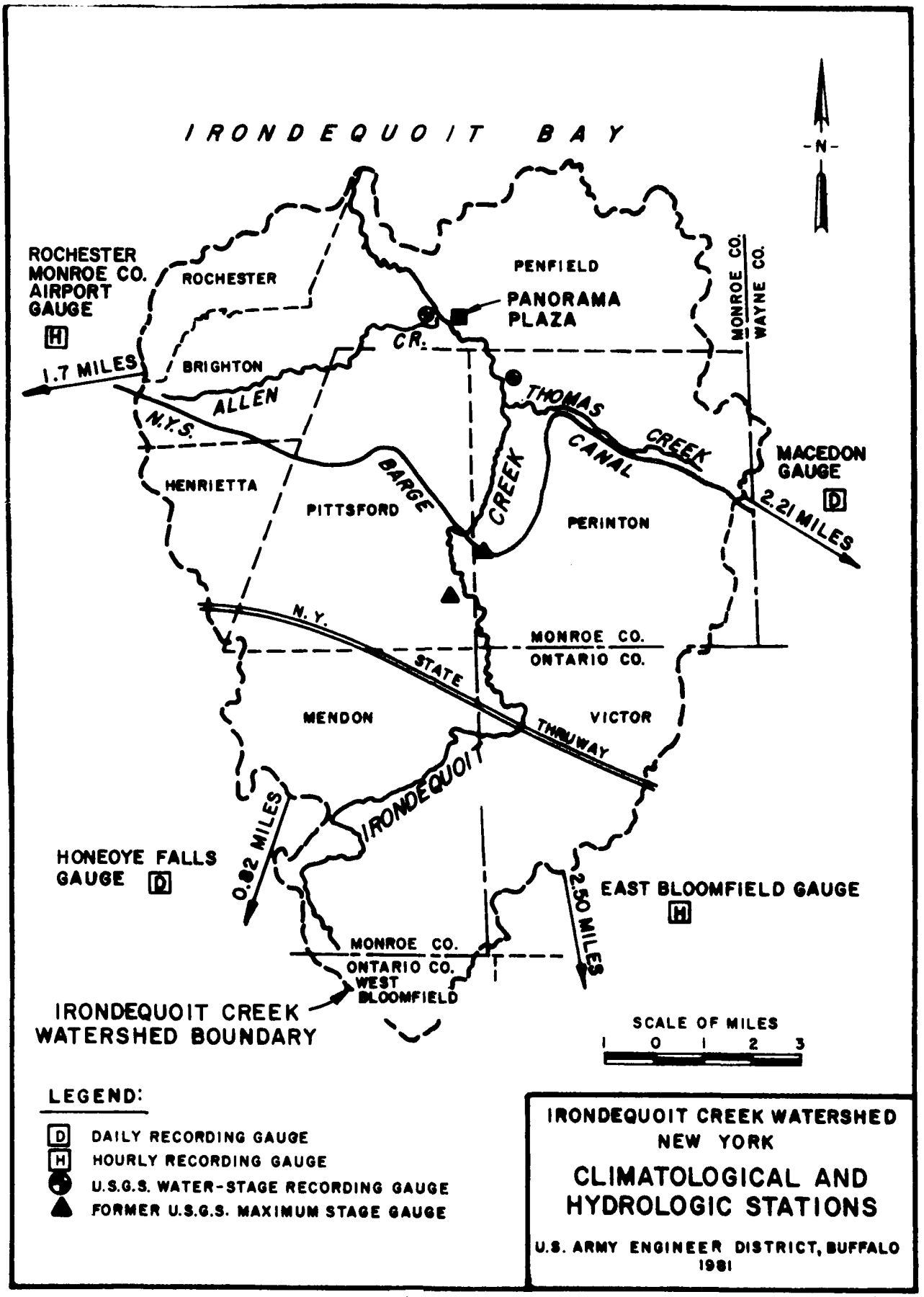
Bedrock - Bedrock underlying the area consists of limestones, shales, and sandstones of the middle Silurian Clinton group and dolomite of the Lockport group. These units form a homocline which dips gently towards the south.

Surficial Deposits - Overlying the bedrock are glacial, lacustrine, and fluvial deposits. Till covers much of the upland and consists of a mixture of sand, silt, clay, and boulders. This till may be suitable for use as borrow material for embankment construction. Thick, sorted sand silt and gravel deposits border the Irondequoit Valley. These were deposited by the ancestral Genesee River into glacial Lake Iroquois, a predecessor to Lake Ontario.

Recently deposited gravel bars can be found in the steeper portion of the creek; finer, overbank deposits can be found in the lower portion of the stream.

GROUNDWATER

The major flow inputs for the main tributaries of Irondequoit Creek are surface runoff and groundwater discharge (either as springs or bank discharge). These are mainly controlled by amount and duration of precipitation. It appears that the groundwater table generally follows the topography of the area. Groundwater recharge by the stream system is invariably a temporary circumstance caused by bank overflow during periods of high flow. The underlying bedrock surface is fairly impervious and thus controls the leakage of groundwater to deeper parts of the system. While there are some scattered lakes and ponds, the New York State Barge Canal and Mendon Ponds Park are the only inland bodies of water with any significant size in the watershed. The reach of Thomas Creek parallel to the Barge Canal also experiences high groundwater due to soil conditions discussed previously. The domestic water supply in the southern and rural areas comes from wells in both rock and unconsolidated deposits. In many places, these wells are not always adequate during prolonged dry periods and the water frequently contains sulfur and minerals. There have been isolated cases of onsite sanitary disposal systems breaking down and discharges into the soil (due mainly to age). Pollution of groundwater can be hard to trace to a direct source. Municipalities in the


IRONDEQUOIT BAY
N
ROCHESTER MONROE CO. AIRPORT GAUGE
H
ROCHESTER
PENFIELD
PANORAMA PLAZA
MONROE CO.
WAYNE CO.
CR.
1.7 MILES
BRIGHTON
ALLEN
THOMAS CREEK
CANAL
MACEDON GAUGE
D
2.21 MILES
N.Y.S.
HENRIETTA
PITTSFORD
BARGE
CREEK
PERINTON
N.Y.
MONROE CO.
ONTARIO CO.
STATE
THRUWAY
MENDON
VICTOR
IRONDEQUOIT
0.82 MILES
HONEOYE FALLS GAUGE
D
2.50 MILES
EAST BLOOMFIELD GAUGE
H
MONROE CO.
ONTARIO CO.
WEST BLOOMFIELD
IRONDEQUOIT CREEK WATERSHED BOUNDARY
SCALE OF MILES
1 0 1 2 3
LEGEND:
D DAILY RECORDING GAUGE
H HOURLY RECORDING GAUGE
U.S.G.S. WATER-STAGE RECORDING GAUGE
FORMER U.S.G.S. MAXIMUM STAGE GAUGE
IRONDEQUOIT CREEK WATERSHED
NEW YORK
CLIMATOLOGICAL AND HYDROLOGIC STATIONS
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

SKETCH 3

northern portion of the watershed receive water from Lake Ontario via the rapidly expanding Monroe County Water Authority.

CLIMATOLOGY

There is a first order weather station located about 1.7 miles beyond the westerly edge of the Irondequoit Creek Watershed, at the Rochester-Monroe County Airport. This station has continuous records for 106 years. There is another hourly precipitation gage, 2.5 miles beyond the southeast boundary of the basin and two daily precipitation gages, one 0.82 miles beyond the southwest corner, and the other 2.21 miles beyond the east boundary. The approximate locations of the climatological and hydrologic stations are shown on sketch 3.

From 40 years of record, 1940 through 1979, normal, annual, and monthly values of precipitation, snowfall, and temperature were obtained. These data for the Rochester-Monroe County Airport Weather Bureau station are presented in subsequent paragraphs.

The 40-year normal annual precipitation is 32.66 inches. The monthly values vary from a low of 2.39 inches in February to a high of 3.08 inches in June.

The 40-year normal annual snowfall for this station is 89.1 inches. Of the monthly means, the highest is 22.9 inches, occurring in January.

The 40-year normal annual temperature for the station is 47.8 degrees Fahrenheit. July is the warmest month, and February the coldest month with average temperatures of 71.3 and 24.4 degrees Fahrenheit, respectively.

ENVIRONMENTAL CONCERNS

General

As a result of a recent fisheries survey conducted during three periods: 9-11 November 1979 and 22-24 May/20-23 June 1980, it appears that the fishery in Irondequoit Creek is a succession of species migrating through the area. Fish enter the study area either to spawn or while enroute to spawning areas upstream of the potential project zone. Most individuals of salmonids, catostomids, and basses enter the study area during the spawning periods and leave soon after. With the exception of some resident sunfishes and minnows, the creek exhibits a series of immigration and emmigration of major sport species and rough fishes. Sport fishing in the stream is seasonal and consists of series of species for limited periods of time. During the fall and spring, Chinook salmon, rainbow, and brown trout are the most sought-after species in creek areas mostly upstream of the potential project site. Currently, trout are not being stocked in the creek by the New York State Conservation Department; former stocks are still under study.

The Irondequoit Creek Watershed supports a variety of game and nongame wildlife resources. Extensive wetlands in the vicinity of the mouth of Irondequoit Creek contain submerged, floating, and emergent vegetation that

provides habitat for aquatic mammal furbearers and birds, as well as amphibians and reptiles. However, no wetlands are found within the Panorama Plaza project zone or along creek areas further upstream. Even with the encroachment of residential, commercial, and industrial development in the stream's lower reaches, some wildlife species still use the riparian habitat and adjoining terrestrial grass/forb/shrub fields as a travel lane, as well as for food and cover.

Concerns

The following items have been identified as resources of environmental concern in the Irondequoit Creek Watershed:

a. Physiography and Geologic Features - The Irondequoit Creek Watershed is marked by a series of two plains rising progressively above one another toward the south. Two prominent west trending escarpments (Niagara and Onondaga) mark the boundaries of these plains. The Niagara Escarpment formed by the resistant Lockport Dolomite runs east-west across the watershed crossing Irondequoit Creek just downstream of its confluence with Allen Creek. The Niagara Escarpment, however, becomes more pronounced to the west of the watershed. The Onondaga Escarpment, formed by Onondaga Limestone, crosses the southern central portion of the watershed through the villages of Pittsford and Fairport.

The most striking physiographic feature in the watershed is the broad valley extending northward through the area to Irondequoit Bay. This valley is known as the Irondogenesee Buried Valley and was the preglacial Genesee River Valley. The valley has a thick blanket of glacial debris consisting mainly of sand and gravel deposited by glaciers during the Pleistocene Epoch. This valley area today generally delineates the course of Irondequoit Creek.

Numerous kames, kame-moraines, kettles, drumlins, eskers, and other unique glacial geologic features are located within the watershed. Mendon Ponds Park, in the southern portion of the watershed upstream of Panorama Plaza, is a National Natural Landmark site that contains and preserves many of these features.

b. Water Quality - Under the New York State Water Classification System, Irondequoit Creek is classified as "B" water which is suitable for bathing. In addition, the upper reaches of the watershed are classified as "I" which is suitable for survival of trout populations. Irondequoit Creek over the years has been plagued with increasing urban development, improperly treated sewage effluents, and polluted land runoffs. Water quality in the creek has, and is expected to continue, to gradually improve as a result of the Monroe County Pure Waters Section 208 Program. The program will investigate non-point source pollution, which includes urban runoff and identify methods of controlling the problem. Municipal and industrial waste water systems will also continue to be investigated and improved.

c. Aesthetic Quality - Many areas with aesthetic qualities exist within the Irondequoit Creek Watershed. This is evident by the number of parks and attractions which emphasize these features. Although it is rapidly

developing, the majority of the watershed is still rural. The unique geologic features, the broad, steep-sloped valleys, the fields, farms, creeks, villages, roads, ponds, wildlife, and plush vegetation all combine to provide many scenic vistas and varying intrinsic aesthetic qualities throughout the watershed.

d. Recreation - The watershed resources provide opportunities for numerous passive and active recreational activities. Much may be attributed to Monroe County's excellent park system. Irondequoit Creek is bordered by numerous parklands which include several hundred acres of land, the largest of which are Mendon Ponds Park in Mendon and Ellison Park near Rochester. A linear park is also proposed that would parallel the creek between Powder Mills Park and Irondequoit Bay by combining several of the parks that presently border the creek. These parks serve to both protect and to provide utilization of the creek resources. The various seasons provide ice and snow-related sports in the winter and a variety of outdoor or water-related sports during the summer. Fish and wildlife resources provide ample opportunity for fishing and hunting, particularly in the upper reaches of the creek tributaries and in and along the marshes and waters of Irondequoit Bay. Water-related recreational sports, including boating, fishing, and swimming, are also available on Lake Ontario, Irondequoit Bay, and the Barge Canal.

e. Cultural Resources - The watershed has a rich heritage that has been preserved in over 30 State and Federal historic, archeologic, and architectural sites. However, no cultural resources have been identified within the Panamora Plaza area.

f. Political Resources - County and town governments and private citizens groups are well organized and active in community and regional affairs. These are the entities that are and will be responsible for the future well-being and sensible growth and development of the watershed and its communities.

g. Human Resources - The well-being of the people and their communities and their wise and sensible continued growth and development are of particular concern in the Irondequoit Creek Watershed from the human environment point of view. The watershed includes parts of or all of eight townships and part of the city of Rochester. Within these townships are numerous towns, villages, and hamlets. The watershed continues to develop rapidly (primarily due to its proximity to the continually developing Rochester area), and some of these communities are or will face development problems. One of the primary concerns of this investigation is to identify and address, where feasible, problems relative to water resources; primarily flooding problems. Flood damage reduction protect existing developments (human resources) from water damage and hazards and enable continued community function that ordinarily would be disrupted by floodwaters. Protection for existing communities facing these problems and prevention of similar situation problems in the future can contribute to the quality and well-being of both and social and economic aspects of the human environment.

The quality of these and other environmental resources should be enhanced by any plan of improvement for the watershed.

Table 1 - Gaging Stations in Irondequoit Creek Basin

Stream	Location & Type	Stream Mile Point	Drainage Area Square Mile	Period of Record
Irondequoit Creek	Pittsford CS (a)	15.25	41.9	1962-1972
Irondequoit Creek	Bushnell Basin CS (a)	13.30	50.3	1962-1972
Irondequoit Creek	Linden Avenue R (b)	7.93	94.6	1973-Present
Allen Creek	Corbetts Glen R (b)	1.14	28.0	1959-Present

(a) Crest-Stage Gage
(b) Continuous Stage Record

Table 2 - Peak Discharges at Selected Gaging Stations in the Irondequoit Basin [1/]

Date	Peak Discharge in cfs at Pittsford	Peak Discharge in cfs at Bushnell Basin	Peak Discharge in cfs on Allen Creek at Corbetts Glen	Peak Discharge in cfs on Irondequoit Creek at Linden Avenue
March, 1960	-	-	2,100	
March 12, 1962	1,140	1,250	782	
March 17, 1963	1,040	1,150	1,050	
March 15, 1964	-	476	481	
February 8, 1965	432	-	320	
February 13, 1966	832	518	492	
January 30, 1968	612	318	775	
April 19, 1969	960	895	790	
December 11, 1969	750	895	-	
January 23, 1972	1,080	-	-	
June 23, 1972	-	1,200	900	
March 17, 1973	-	-	1,080	-
May 17, 1974	-	-	3,280	1,340
October 29, 1974	-	-	-	1,480
March 4, 1976	-	-	959	1,020
March 21, 22, 1978			890	842
March 5, 1979				1,350
September 14, 1979			935	

1/ 1960-1972 information taken from the 1975 Flood Plain Information Report for Irondequoit Creek.

STREAMFLOW DATA

Records of peak discharge are available for Irondequoit Creek from 1962 to present. This information is from crest-stage gages located at Bushnell Basin and Pittsford, NY. There are two active short-term gaging stations in the Irondequoit Watershed; one on Irondequoit Creek upstream from the Linden Avenue bridge near Penfield, which has been in operation since 1924, and one on Allen Creek with a period of record from 1959 to the present. Table 1 contains the location, drainage area, and period of record for these gages.

Generally, the discharge records for Allen Creek are poor because they include undetermined diversion flows from Barge Canal upstream from the station.

Peak discharges for selected floods on Allen Creek and the crest-stage stations on Irondequoit Creek are tabulated in Table 2.

Newspaper files, historical documents, and records were searched for information concerning past floods to supplement records from the gaging stations. Very few records of past flooding exist. When floods did occur in the Irondequoit Watershed, they apparently did not affect many people, and were not as newsworthy as the often corresponding floods on the nearby Genesee River which typically received broad coverage in the media.

A Flood Plain Information (FPI) Report for Irondequoit Creek, from its mouth upstream to river mile 25.0 in the town of Mendon, was prepared by the Buffalo District in February 1975. Field surveys were performed for this FPI Study to obtain the necessary hydraulic information. Field investigations were also conducted to obtain essential flood plain information such as high water marks, flow obstructions, and existing and planned development.

Information obtained in the field was then studied and analyzed to produce computational data that were utilized to obtain water surface profiles for selected future floods along the 25-mile length of Irondequoit Creek.

DEMOGRAPHY AND ECONOMY

GENERAL

The major portion of the watershed lies within Monroe County. The remaining area, approximately 13 percent of the watershed, is located in Ontario and Wayne Counties.

Table 3 - Population Characteristics and Population Trends for Towns Within the Watershed [1/]

	1970	1977	1980 [3/]	1985	1995	2005	2015	2025	2035
Penfield	23,782	27,473	27,201	29,700	35,800	41,400	47,900	55,500	64,200
Perinton	31,568	43,798	41,802	45,700	51,100	55,700	60,700	72,100	72,100
Pittsford	25,058	26,283	26,743	27,200	30,000	32,300	34,800	37,500	40,300
Brighton	35,065	37,241	35,776	38,100	41,400	43,900	46,500	49,300	52,300
Monroe County	711,917	730,928	702,238	748,800	832,400	895,300	962,600	1,034,900	1,112,600
Towns in Monroe County [2/]	416,940	471,928	460,497	494,800	565,900	624,100	686,800	754,600	827,600
City of Rochester	294,977	259,000	241,741	254,000	266,800	271,200	275,800	280,300	285,000

1/ Source: Monroe County Master Plan (years 1970, 1977, 1985, and 2000). Growth rate 1977-2000 from Monroe County Master Plan used in projecting population through year 2035.

2/ Population of Monroe County minus population of city of Rochester.

3/ Source: 1980 Census figures.

Major political subdivisions located partly, or completely, within the study area are:

Monroe County	Ontario County
Rochester, City	Victor, Town
East Rochester, Village	West Bloomfield, Town
Pittsford, Village	
Fairport, Village	Wayne County
Pittsford, Town	
Brighton, Town	Macedon, Town
Penfield, Town	
Perinton, Town	
Henrietta, Town	
Irondequoit, Town	
Mendon, Town	

As the growing Rochester suburban area expands, the Irondequoit Creek Watershed, once primarily rural, is undergoing continued rapid suburban development. The watershed is bounded on the north by Irondequoit Bay, on the northwest by the city of Rochester, and by various villages and towns in the remaining areas. The central portion of the watershed is traversed in an east-westerly direction by both the New York State Barge Canal and the New York State Thruway. A highly-developed residential area extends from the northern watershed boundary to the vicinity of the Barge Canal and comprises approximately 35 percent of the land in the watershed. A majority of the watershed is heavily vegetated, except in population centers.

Within the watershed, wholly or in part, lie three counties, one city, 10 towns, and three villages. Over 90 percent of the watershed lies in Monroe County.

The governmental entities in the watershed are generally well informed and progressively minded. Extensive conscientious planning has already been done for recreation, water quality, natural resource conservation, and flood plain management. The town governments are practically autonomous in any land use decisions related to the above. It is therefore the town governments of the watershed that would ultimately decide how the recommendations from this study would be implemented.

POPULATION

The population of the watershed is approximately 230,000. Monroe County housing is up 25 percent since 1970 and indications are that growth will continue in the Irondequoit Watershed but at a somewhat slower rate. The economy of the area is considered strong and the per capita income is well above the national average. The population trends for the towns within the Irondequoit Creek Watershed are indicated on Table 3.

LAND USE

General

As the growing Rochester suburban area expands, the Irondequoit Creek Watershed, once primarily rural, is undergoing continued rapid development. A highly-developed residential area extends from the northern watershed boundary to the vicinity of the Barge Canal and comprises almost 35 percent of the land in the watershed. Water quality of the creek deteriorates as it flows northward to the more urban areas of the watershed.

The zoning currently in effect is diversified and directly reflects the location, size, and population of the many different municipalities. It ranges from various types of residential and multi-agricultural uses to commercial, manufacturing, and recreational development.

Agriculture

A large percentage of the watershed land use pattern, from its most northernly sector to the vicinity of the Barge Canal, is highly residential urban development. The upper reaches of the watershed in Ontario County and town of Mendon in Monroe County, however, are mainly used for dairy farming, and vegetable and fruit farms. The overall number of farms in the area is decreasing, but the trend is to larger, more efficient farms. An important constraint to future agricultural development is the rugged topography in portions of the watershed. There is no agricultural land use in the vicinity of the Federal project recommended for the Panorama Plaza area.

Commercial

Commercial districts are widely scattered throughout the watershed, with larger ones concentrated in areas of higher population and along main transportation corridors. A variety of shopping malls and smaller plazas exist within easy access of most of the populace. The Panorama Plaza area is the major center of commerce in the town of Penfield.

Manufacturing

The Rochester and Monroe County area has a wide diversification of industries, owing largely to excellent air, highway, and rail transportation systems, which also include the harbor of Rochester and the New York State Barge Canal. The major industries in the county area produce photographic equipment, clothing, instruments, glass, electronic equipment, other manufactured goods, and processed food.

Recreation

Recreation revolves around the excellent park system of Monroe County and the towns within the watershed. The various seasons provide ice and snow-related sports in the winter and a wide variety of outdoor or water recreational sports during the summer. Water-related recreational sports are available on Lake Ontario, Irondequoit Bay, and the Barge Canal.

TRANSPORTATION

Transportation in the Rochester area is provided by an excellent transportation network that includes several limited-access, high-speed highways; several railroads; waterborne commerce facilities using Rochester Harbor, and the Erie Barge Canal; and three major airlines. More than 100 trucking companies serve the county area and buslines provide passenger service between the city of Rochester and outlying towns. Two major highways, Rt. 490 and Rt. 441, provide convenient access to the southwestern portion of Penfield.

POWER

The normal low, dry weather flows and the flashy flood flow characteristics of the creeks and streams in the watershed, and the general lack of steep stream slopes, make production of hydroelectric power economically impracticable. During the 19th and early 20th century, however, many small mills existed along the creek utilizing waterpower. They have all since disappeared due to more economical mill power sources being introduced in the early 20th century.

NATURAL RESOURCES

There are many important resources within the study area and Monroe County. Water is probably the most important natural resource of the area, due to its recreation, water supply, industrial, and transportation usage. The soils which make possible the growing of fruits and vegetables and provide pasture for dairying also form a valuable resource. Mineral resources include dolomite, limestone, gypsum, sand and gravel, and natural gas. Road materials and building stones are the most important bedrock products quarried locally. The Lockport dolomite is the chief source of crushed stone and road material. Gypsum is produced from the upper part of the Camillus shale which underlies the southern part of Monroe County.

WATER SUPPLY

The domestic water supply in the southern rural areas of the watershed comes from deep wells in both rock and unconsolidated deposits. Wells are also the main source of water for the towns and villages, except those near Lake Ontario or those suburbs of Rochester that are served by the municipal water system. In many places, wells are not always adequate during prolonged dry periods. Also, the water in the area frequently contains sulfur, and high concentrations of salts, and is hard. The water supply for the city of Rochester comes from Hemlock Lake and other upland reservoirs, as well as directly from Lake Ontario. Much of the water for the suburbs of Rochester also comes from Lake Ontario via the rapidly expanding Monroe County Water Authority.

NAVIGATION

There is no motorized navigation on Irondequoit Creek or its tributaries. Irondequoit Creek flows into Irondequoit Bay, which is highly used for recreational boating. Irondequoit Bay in turn flows into Lake Ontario, which

also is highly used in the Rochester area for small-craft recreation, especially sailing. Presently, there are bridge constrictions over the bay outlet that restrict boating between the bay and Lake Ontario. Rochester Harbor, 10 miles northwest of the mouth of Irondequoit Creek is a commercial and recreational navigation harbor. The New York State (Erie) Barge Canal, which runs east-west through the watershed, maintains both commercial and recreational navigation.

PROBLEMS AND NEEDS

GENERAL

The purpose of this section is to identify, describe, and dimension the water and related resource problems and needs of the Irondequoit Creek Watershed area.

FLOOD CHARACTERISTICS

Major floods can occur on Irondequoit Creek during any season of the year. Floods within the Irondequoit Creek basin result when excessive overland runoff concentrates in the tributaries. The magnitude of the main stream's flood crest and discharge is dependent on the tributaries' crests and discharges. Excessive runoff in the Irondequoit Watershed results from one of the following conditions: (1) A collision, over the watershed, of a large mass of warm moisture-laden air from the South Atlantic or Gulf Regions with a mass of air of low temperature from the north. These are also known as "fronts." (2) Spring floods which are normally the result of sharp rises in temperature which melt the snow cover of the basin, being frequently accompanied by rains. (3) Localized thunderstorms.

The physical characteristics of the watershed are other factors that may cause flooding. The physical characteristics of the Irondequoit Creek drainage watershed vary considerably between upstream and downstream sections. The upper portions of the Irondequoit Watershed have relatively steep gradients. In these areas, floods exhibit more rapidly rising and falling hydrographs. The upstream flood plains are relatively narrow with little storage and high velocities wherein large quantities of debris and sediment are transported for considerable distances. As the creek flows downstream through the town of Penfield, the gradient decreases, the flood plain widens, and the hydrographs exhibit longer periods of rise, broader peaks, and a longer period of fall.

OBSTRUCTIONS

Natural obstructions, such as vegetation along banks and channels, and fallen trees, will restrict the creek's flow capacity. Man-made obstructions such as undersized or unmaintained culverts, undersized or unmaintained bridge openings, and encroachment into the flood plain with land fill or developments will also restrict the creek's capacity.

During floods, ice, trees, brush, and other vegetation growing in floodways impede flood flows, thus creating backwater conditions and increased flood heights. Trees and other debris may be carried downstream to collect at bridges and/or other obstructions. The debris plugs the bridge or culvert openings and retards the flood flow. These retarded flood flows then pool and create additional upstream flooding, erosion around the culvert entrances and bridge approach embankments, and possible damage to the overlying road bed. When masses of debris break loose, the debris and impounded water surge downstream until another obstruction is encountered. Debris collecting

against a bridge could create sufficient pressure that exceeds its structural capacity, thereby destroying the bridge.

Photos 1 and 2 illustrate typical natural obstructions in the Irondequoit Creek floodway.

There are 48 bridges listed in Table 4 which cross Irondequoit Creek. Most of them are obstructive to the Intermediate Regional Flood and even more are obstructive to the Standard Project Flood. In some cases, the bridges may be high enough so as not to be inundated by flood flows; however, the highway approaches to these bridges may be at lower elevations and subject to flooding and thus rendered impassible to traffic.

An important consideration is the influence of the New York State Barge Canal on the flood flows. The Barge Canal crosses the Irondequoit Valley, and is characterized by high man-made embankments. The bottom elevation of the canal is often higher than adjacent topography. The creek passes under the canal through slightly undersized culvert. During periods of high discharges, the combination of the undersized culvert and the high embankments exert a dam-like influence on the flow. At high flows, there is some reduction of flow through the culvert, causing water to pond on the upstream side of the crossing.

Photo 3 is a view of the downstream side of the Ketchum Road bridge. The high embankment of the New York State Barge Canal is in the background.

URBANIZATION AND ENCROACHMENT

The increased urbanization of formally undeveloped agriculture land during recent decades has also increased the incidence of flooding. Where the flow once prevailed over a rough terrain and along field gullies and stream channels, urbanization provides hydraulically smooth gutters, streets, storm drains, and open-channel floodways that convey runoff rapidly to downstream points. Urbanization also increases the degree of imperviousness to the watershed area, which increases the amount of flow to be carried by the creek.

Future encroachments onto the Irondequoit Creek flood plain should be carefully studied by the local planning agencies to assess their impact upon existing flood plain conditions and future flood stages.

The Irondequoit Creek Watershed includes varying degrees of the above-mentioned flood-producing factors which will be addressed in the ensuing sections of this report.

EROSION

Erosion is a two-fold problem, being found naturally in the streambed itself and also along the banks and land near the creek. Streambed and bank erosion can significantly alter the course and flow characteristics of the channel, while land erosion can affect the flood plain and water quality. Many

Photo 1 – Typical natural obstructions across Irondequoit Creek, mile point 17.30. Photo taken August 1974.

Photo 2 – Typical natural obstruction across Irondequoit Creek, mile point 17.25. Photo taken August 1974.

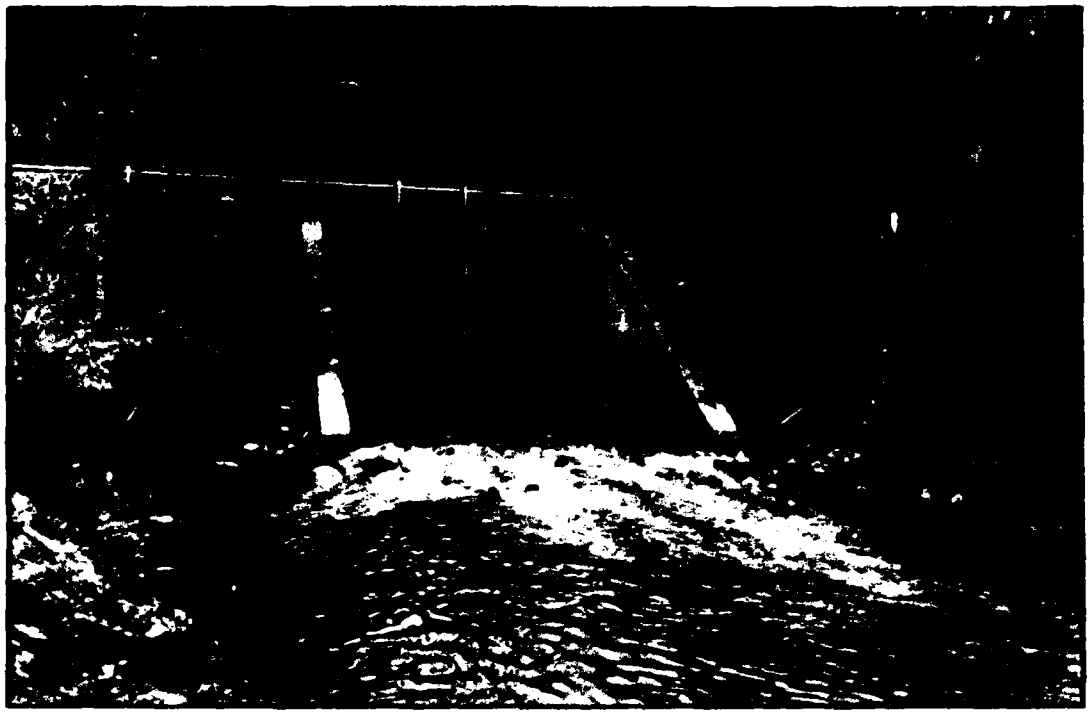


Photo 3 The New York State Barge Canal embankment rises approximately 55 feet above the Ketchum Road bridge. Photo taken April, 1974.

Table 4 - Bridges Across Irondequoit Creek 3/

Bridge	Mileage Above Mouth	Approximate Stream Bed Elevation 1/	Approximate Low Steel Elevation 1/	Approximate Bridge Floor Elevation 1/	Water Surface Intermediate Regional Flood 2/	Elevation Standard Project Flood 2/
Empire Boulevard Bridge	0.04	239.2	252.5	255.7	252.3	259.1
Water Pipe Overpass	0.05	239.2	252.5	255.7	253.7	259.6
Browncroft Boulevard Bridge	2.13	243.4	257.9	263.5	257.9	265.3
Ellison Park Bridge	2.73	246.1	252.8	254.2	258.7	266.4
Ellison Park Foot Bridge	3.22	246.1	254.6	255.6	259.1	266.9
Ellison Park Foot Bridge	3.29	246.4	254.5	256.2	259.1	267.0
Blossom Road Bridge	3.48	243.7	257.0	260.9	259.5	267.1
Ellison Park Bridge	3.58	245.3	256.3	258.0	259.6	267.2
Ellison Park Foot Bridge	3.85	247.8	256.4	257.9	259.6	267.3
Construction Bridge	4.38	248.9	259.0	260.4	263.3	270.1
Old Penfield Road Bridge	5.73	256.2	267.5	269.3	271.0	275.5
Penfield Road Bridge	5.78	256.2	281.9	286.0	271.1	276.7
Plaza Ext. Bridge	6.00	258.0	265.0	269.0	272.7	277.3
Panorama Trail Bridge	6.22	261.1	276.2	280.6	273.0	277.7
N.Y. 441 Bridge	6.53	264.0	291.8	300.2	276.8	283.9
Washington St. Bridge	7.05	305.1	317.8	320.0	320.9	326.0
Linden Avenue Bridge	7.91	352.0	370.0	373.9	360.1	365.8
Village Garage Bridge	8.97	362.1	371.8	373.9	373.0	377.2
Penn Central RR Bridge	9.06	363.5	395.0	410.1	374.1	379.1
Dump Road Bridge	9.10	364.6	386.6	392.7	375.8	384.6
Fairport Road Bridge	9.84	369.7	388.5	391.6	380.9	392.1
Penn Central RR Bridge	9.96	372.4	402.3	435.0	385.8	394.4
Pittsford Palmyra Rd. Bridge	12.38	380.8	394.7	407.0	393.2	399.3
Interstate 490 Bridge	12.56	382.7	395.8	400.8	395.8	401.8
Ketchum Road Bridge	13.36	389.9	398.8	407.4	399.6	403.7
Barge Canal Overpass	13.41	-	-	-	-	-
Pittsford Victor Road Bridge	13.46	392.2	401.3	442.0	408.6	435.0
Thornell Road Bridge	15.58	405.0	417.3	419.4	417.0	436.2
Park Road Bridge	16.39	409.1	418.5	420.4	423.8	437.0
Powder Mill Park Foot Bridge	17.37	420.0	431.6	432.7	434.2	440.2
Woolston Road Bridge	17.45	420.9	428.0	431.3	434.6	440.7
Probst Road Bridge	18.91	446.7	457.8	460.7	455.4	457.9
RG&E Bridge #3	19.88	463.7	475.1	477.9	482.6	491.0
RG&E Bridge #2	20.05	464.2	473.2	493.2	487.4	494.8
Fisher Road Bridge	20.13	466.6	476.8	480.8	487.6	495.0
New York Thruway Bridge	20.74	476.9	487.0	497.7	489.5	499.9
Penn Central RR #1 Bridge	21.09	479.5	493.3	506.6	500.9	508.8
Main Street Fishers Bridge	21.24	483.1	495.0	496.4	501.0	509.1
Norris Road Bridge	22.02	505.1	511.3	514.5	512.8	516.3
University Club House Bridge	22.26	513.3	520.0	523.0	521.8	524.2
Mile Square Road Bridge	22.66	527.0	536.7	537.9	539.0	540.3
Pittsford Gravel Co. Bridge	23.50	550.7	555.7	557.8	558.5	560.7
Lehigh Valley RR Bridge	23.62	550.2	565.5	571.8	560.0	569.9
N.Y. 251 Bridge	23.95	559.7	567.5	569.0	569.0	573.1
N.Y. 64 Bridge	23.99	558.9	568.1	571.1	569.8	573.7
Brooks Road Bridge	25.26	563.8	572.2	573.6	575.5	579.9
Taylor Road Bridge	26.66	576.3	586.0	588.4	586.5	590.6
Cheese Factory Road Bridge	27.76	599.9	605.8	607.5	607.8	609.1
Boughton Hill Road Bridge	30.12	645.5	651.4	653.4	654.8	656.5

1/ All elevations given are on United States Coast & Geodetic Survey datum.
2/ Water surface elevations refer to upstream side of respective bridge.
3/ Data taken from the Irondequoit Creek Flood Plain Information Report dated February 1975.

factors affect the time required for serious erosion to develop, among them streambed material, velocity distribution, vegetation, soil type, topography, and especially rainfall regime, where a few intense storms can account for severe localized land erosion. Soil conservation methods and vegetal cover can reduce the impact of rain and increase the infiltration capacity of the soil, thereby retarding erosion. However, it must be kept in mind that a stream requires a normal sediment load to avoid scouring.

Streambank erosion problems are few and localized within the watershed and rank behind flood-related problems in seriousness. The following list of streambank erosion problems and locations were identified by the public officials of the municipalities involved.

Town of Brighton	- Some minor erosion along Allen Creek.
Town of Henrietta	- Some minor erosion along Allen Creek.
Town of Mendon	- Minor erosion at a large gravel pit, kept in check by retention ponds.
Town of Penfield	- (1) Future erosion will affect a parking lot downstream from the town's sewage treatment plant; (2) Blossom Road near Ellison Park - guard rails along side of the road are affected.
Town of Perinton	- Small stream (referred to as Tributary 16) poses a severe problem requiring reinforcement and stabilization of stream banks; due to upstream development.
Town of Pittsford	- Erosion upstream of the Barge Canal. Private property along both sides of stream here.
Village of Pittsford	- Severe erosion problem along a small, unnamed stream that empties to Barge Canal. It runs between backyards, with individual property owners using railroad ties as shoring. There are some exposed water mains and Austin Parkway is being severely eroded.

There is a significant amount of sheet erosion in the cropland area of the watershed. Erosion rates exceeding 3 tons per acre per year are considered excessive in the watershed. The study of cropland sheet erosion was not considered within the scope of this study.

NOTABLE PAST FLOODS

There is little definitive historical record of flood events for the Irondequoit Creek Watershed. This is most likely due to the lack of gaging records prior to 1959, and apparent rural, low population density within the

flood plains of the watershed prior to the 1950's. Subsequent paragraphs provide a brief description of known past floods.

May 1864 - This was the largest known flood to date. A heavy rain and subsequent overbank flows caused considerable damage to flour and saw mills adjacent to the creek in the Penfield area.

September 1912 - A flood resulted from a break in the Barge Canal at the crossing over Irondequoit Creek. The escaping canal water washed out about 500 feet of embankment and the Barge Canal was inoperable for over a month.

Spring 1934 - This flood was caused by a sudden thaw after a cold spell. Chunks of ice took out the Daisy Flour Mill dam in Penfield near Ellison Park, forcing them to change to diesel power.

31 March 1960 - This is the major recent flood event that has, at best, a sketchy historical record. It has been determined that in other local drainage basins, such as Black Creek and Oatka Creek, which are tributaries of the Genesee River in western Monroe County, and the Lower Genesee River basin, the March 1960 flood was approximately a 15-year event on Allen Creek. Considerable damage was caused in the Panorama Plaza area of Penfield.

May 1974 - Irondequoit Creek and Allen Creek flooded as a result of thunderstorms which dropped from 3 inches to 4 inches of rain. The Panorama Plaza area of Penfield was hardest hit. The basements of a recently constructed apartment development were flooded to a depth of 6 to 7 feet. Property damage was very high with numerous buildings and cars being flooded. This was a localized storm with the greatest rainfall occurring over the Allen Creek Watershed of Irondequoit Creek in northeast Monroe County. The May 1974 flood was approximately a 50-year event on Allen Creek.

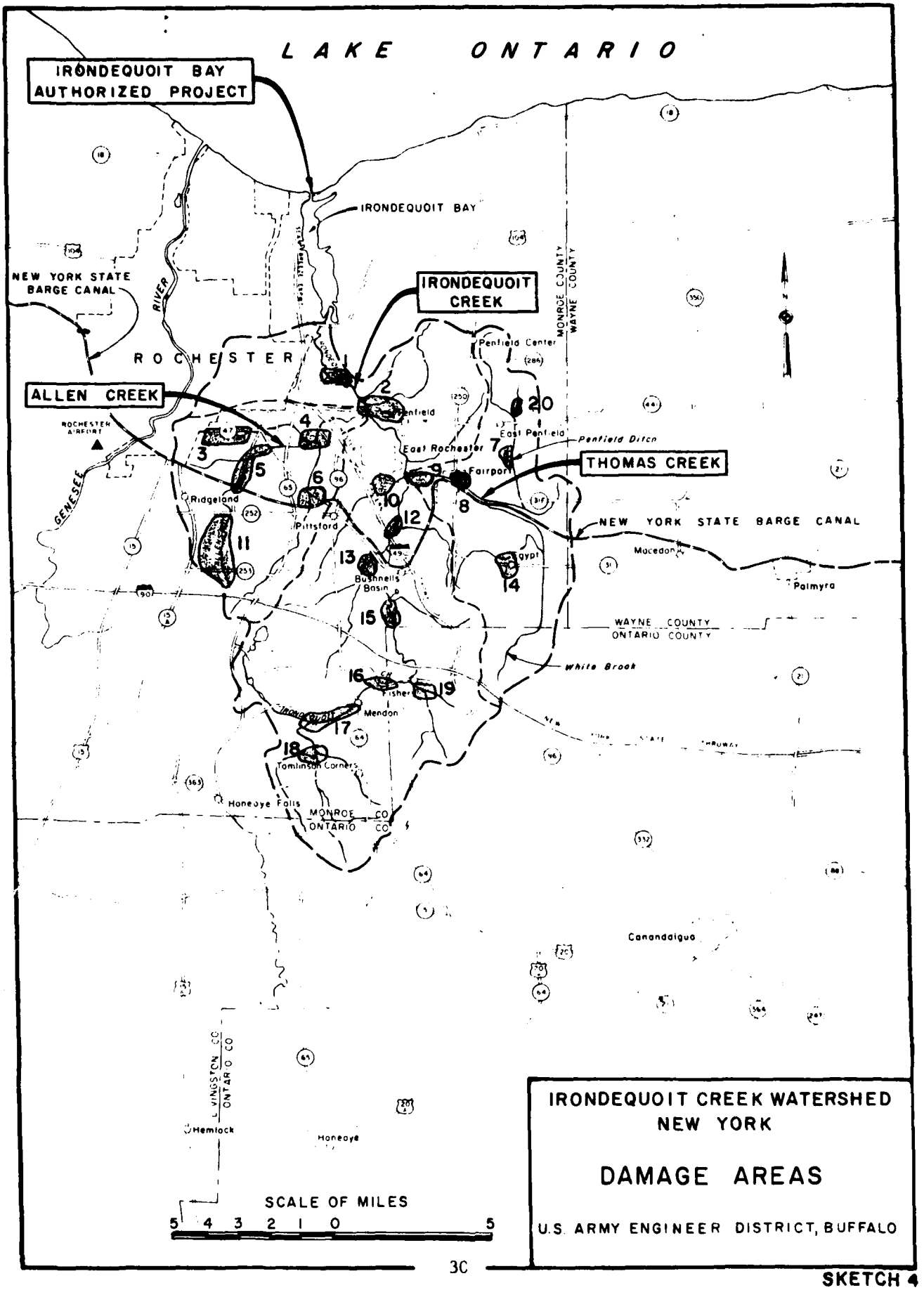
October 1974 - A collapse in the bottom of the Barge Canal at the Interstate 490 overpass in the Bushnell Basin area caused severe local flooding with great property damage. A number of homes immediately downstream from the breach in the canal were completely destroyed from the sudden surge of water into the low-lying area. The flood profile at the nearby Interstate 490 and Pittsford-Palmyra Road bridges on Irondequoit Creek approximated that of the 100-year frequency flood event.

March 1976 - On the 3rd and 4th of March 1976, about 0.7 inches of rain, combined with 3 inches of snow on the ground produced flooding along Irondequoit Creek.

On the 3rd of March 1976, the weather conditions were mixed, with heavy fog, thunderstorms, ice pellets, glaze and rain with above-freezing temperatures.

On the 4th of March 1976, above-freezing temperatures and heavy fog was prevalent.

On the 3rd and 4th of March 1976, in the Panorama Plaza area, the flooding was confined to parking lots and streets. No physical damage was reported.



IRONDEQUOIT CREEK WATERSHED
NEW YORK

DAMAGE AREAS

U.S. ARMY ENGINEER DISTRICT, BUFFALO

SKETCH 4

Table 5 - Damage Areas in Irondequoit Creek Basin

Area No.	Description
1	Ellison Park - Towns of Brighton and Penfield Irondequoit Creek meanders through the park and inundates large areas of the park yearly in the spring. Physical damages are minimal because the park becomes a natural flood plain. The only structures are a few small park structures and three or four homes which could be evacuated or floodproofed.
2	Panorama Plaza - Town of Penfield The 1960 flood caused considerable overland flooding in the plaza area with intermediate damage. Future floods greater than the 1960 flood could cause excessive damage to the plaza and adjacent Brook Hill apartments.
3	Residential Area - Town of Brighton The reports of flooding in this area, along a tributary to Allen Creek, have become more prevalent in recent years due to increased development. Physical damages are minimal and do not justify a Federal project. The few homes in the area could be floodproofed.
4	Golf Course - Town of Pittsford A tributary to Allen Creek, with low banks, runs through the golf course, causing considerable overland flooding which results in landscape damage. The homes on the west end of Country Club Drive experience periodic basement flooding which could be prevented by floodproofing.
5	Residential Area - Town of Brighton The Stonybrook Road area had considerable damage in 1960, including damage to driveway bridges caused by overbank flooding of Allen Creek. Floodproofing could reduce damages in the area. Major structural protection measures are not recommended.
6	Residential Area - Town of Pittsford This area is on a tributary to Allen Creek. The area has been flooded many times, however, the damage costs have been minimal for homeowners. The inadequately sized Penn Central R.R. culvert is a restriction to large flows.

Table 5 - Damage Areas in Irondequoit Creek Basin (Cont'd)

Area No.	Description
7	Undeveloped Area - Town of Perinton
	The land adjacent to Thomas Creek is low and is floodprone. However, the lack of development nullifies any need for any immediate flood protection measures.
8	Railroad and Undeveloped Area - Town of Perinton
	This area encompasses a railroad complex and a low swampy area between the railroad and the Erie Canal. The area along Thomas Creek is largely undeveloped and there is no significant flood damage. Clearing and snagging is recommended in the area.
9	Residential Area - Town of Perinton
	A school, a small manufacturing firm, and a few homes along Midvale Drive are susceptible to flooding at the confluence of Thomas Creek into Irondequoit Creek. No major flooding has occurred in recent years. Minor channelization and floodproofing of the structures could improve conditions.
10	Residential Area - Towns of Pittsford and Perinton
	Minor flooding occurs in the area mostly caused by inadequate culverts. The tributary to Irondequoit Creek is so small that Federal investigation would be unwarranted due to the lack of economic justification.
11	Residential Area - Town of Henrietta
	Minor flooding problems of Allen Creek have occurred in the area, mainly due to inadequate drainage ditches and sewer backups. The town of Henrietta corrected most of the drainage ditch problems.
12	Residential Area - Town of Perinton
	Most of the development in this area is on high ground with little incidence of flooding. There is some bank damage along the creek from a previous flood caused when the Barge Canal broke.
13	Residential Area - Town of Pittsford
	Some minor flooding has occurred in the area but the main problem is bank erosion caused from backups at the Barge Canal culvert.

Table 5 - Damage Areas in Irondequoit Creek Basin (Cont'd)

Area No.	Description
14	Residential Area - Town of Perinton There is minimal development in an area tributary to White Brook. There has not been any damage reported in recent years. 1/
15	Powder Mill Park - Town of Perinton Flooding in this area of Irondequoit Creek occurs occasionally but does not result in any damage other than cleanup. This is an area of wise flood plain usage.
16	Farmland - Towns of Mendon and Victor Flooding occurs almost every spring. However, the area along Irondequoit Creek is very rural in nature and has minimal flood damage.
17	Residential Area - Town of Mendon This area has been damaged by minor floods frequently. The causes of the flooding are an inadequate channel, ice jams, and debris. Relief could be obtained through clearing, snagging, and channelization.
18	Farmland and Undeveloped Area - Town of Mendon There are only a few structures near the flood plain of Irondequoit Creek and flood damage is minimal. A Federal project would be difficult to justify.
19	Residential Area - Town of Victor There are possibly only two structures that would be affected from flooding and damage would be minimal along a tributary to Irondequoit Creek.
20	Residential Area - Town of Penfield A ditch tributary to Thomas Creek running through the area creates some flooding problems, but are not serious enough to warrant further investigation.

1/ The latest U.S. Geological Survey Watershed Map for Irondequoit Creek (Sketch 2) does not include this area in the Irondequoit Creek Watershed.

GENERAL FLOODPRONE AREAS

IRONDEQUOIT WATERSHED

The Irondequoit Creek Watershed is subject to annual flooding of varying degrees in many scattered areas. Sketch 4 shows 20 scattered floodprone areas of probable concern in the watershed. Table 5 lists the probable damage areas and provides a brief description of the area. The 20 major areas of potential flood damage in the Irondequoit Creek Watershed were surveyed in 1968 by Buffalo District personnel. The potential floodprone areas were further investigated during interviews with area officials and residents over the years since 1968. A record of interviews and completed questionnaires are included in the appendix of a report titled "Irondequoit Creek Study" completed in April 1978 for the U.S. Army Corps of Engineers by McPhee, Smith, Rosenstein Engineers, Buffalo, NY.

IRONDEQUOIT CREEK

A major portion of the 20 floodprone areas are along the main branch of Irondequoit Creek. They are areas 1, 2, 12, 13, 15, 16, 17, 18, 19, and part of 9. Area 1 is a county park named Ellison Park, and area 2 is a highly urbanized area including a large, highly damageable plaza area called Panorama Plaza. The remaining areas, 12, 13, 15, 16, 17, 18, and 19, are mainly residential or rural with varying potential flood damage conditions and population densities. All areas, however, have experienced flooding to some degree. Plates detailing flooded area maps and water surface profiles for Irondequoit Creek were developed in a Corps Flood Plain Information Report dated February 1975. The plates indicated the degree of flooding that could be expected in the 20 identified damage areas.

THOMAS CREEK

The major areas of potential flood damage along Thomas Creek, as investigated during the District's April 1968 damage survey, are areas 7, 8, 9, and 20 shown on sketch 4. There has been little or no previous flood damage reported in these four areas. However, recent residential development in areas 9 and 20 has now made a number of homes susceptible to potential flood damage. There is little additional definitive information concerning these potential flood damage areas, due to the small size and isolated nature of the damage areas.

ALLEN CREEK

The major areas of potential flood damage along Allen Creek, as surveyed in April 1968, is a portion of area 2, and areas 3, 4, 5, 6, and 11, as shown on sketch 4. All of the areas, except area 4, are residential, with higher population densities.

OTHER UNNAMED TRIBUTARIES

Areas 10 and 14 are also areas of potential flood damage that exist along other minor tributaries to the Irondequoit Creek. Both areas experienced

minor or no damage during the March 1960 flood. However, these areas have experienced development in recent years, and the potential for some flood damage now exists.

PERTINENT FLOODPRONE AREAS

GENERAL

The 20 damage areas were investigated numerous times since they were first surveyed in 1968 and presented later in the Irondequoit Creek Plan of Study, dated September 1976. Flood problems in Ellison Park (area 1), Panorama Plaza (area 2), and Bushnell Basin (area 13), have been well documented in the past. Ellison Park, a part of the Monroe County Park system, receives little economic damage and only restricted use during flood conditions. Panorama Plaza has had one severe flood damage event in 1964 with occasional incidences of minor property damage over the years due to flooding. Bushnell Basin has experienced severe erosion and minor flooding problems in the vicinity of the Barge Canal culvert vicinity. The remaining 17 floodprone areas have either had their problems corrected or have been identified by municipal officials as creating no economic damages outside of isolated, occasional problems such as flooded basements. The officials' comments are documented in the appendix of the "Irondequoit Creek Study" completed in April 1978 for the U.S. Army Corps of Engineers. The Corps has decided that the 17 floodprone areas have only minor damages and do not have sufficient flood control or erosion protection benefits to warrant a structural Federal project. A nonstructural basin-wide plan will be presented in the ensuing sections of the report for Non-Federal implementation.

The following areas were considered to warrant further Federal investigation.

ELLISON PARK

Ellison Park (area 1) is located in the towns of Penfield and Brighton, and is maintained by the Monroe County Park System. The park currently contains four homes and one business, with no record of serious flooding. The park land serves as a natural flood plain with very little property damage, even though there is bank overtopping every spring. Since the park serves as a nonstructural solution to the flood problem, it is recommended that no further investigation be made by the Corps of Engineers.

PANORAMA PLAZA

Panorama Plaza (area 2) is located in the town of Penfield. This area lies in the lower region of the Irondequoit Creek Basin, and in conjunction with the confluence of Allen Creek and Irondequoit Creek behind the plaza, creates an environment vulnerable to flooding at high water conditions. Severe backwater on either creek is initiated at the confluence, which spills over the low-lying banks. The more recent floods since 1960 have centered most of the damage in the Panorama Plaza area. Photos 4, 5, 6, 7, and 8 depict the areas that were inundated by the 1976 flood.

PHOTO 4 - UPSTREAM SIDE AT ACCESS BRIDGE BEHIND PANORAMA PLAZA DURING MARCH 1976 FLOOD.

PHOTO 5 - LOOKING NORTH AT THE REAR OF PANORAMA PLAZA DURING MARCH 1976 FLOOD.

Photo 6 Looking North at Brookhill Apartments.

PHOTO TAKEN SPRING 1976

Photo 7 Looking from Old Penfield Road to Brookhill Apartments.

PHOTO TAKEN SPRING 1976

PHOTO 8 - GABION WALL ON EAST BANK OF ALLEN CREEK, PROTECTING THE SYBRON/NALGE CORPORATION - March 4, 1976.

PHOTO 9 - VIEW OF DOWNSTREAM SIDE OF PANORAMA PLAZA EXTENSION ROAD BRIDGE - April 1974.

PHOTO 10 - LOOKING SOUTH AT BRIDGE LOCATED ON OLD PENFIELD ROAD DURING MARCH 1976 FLOOD.

The right bank of Irondequoit Creek development consists of Panorama Plaza, and includes numerous supermarkets, a movie theater, fast food restaurants, automobile service stations, and other commercial outlets. There also exists the Brook Hill and Penfield Park apartment buildings just downstream of the plaza, with several homes and small office buildings in the area. The left bank consists of an automobile dealership, the Sybron/Nalge Corporation, and several light manufacturing structures. From the Flood Damage Survey of 1977, which was completed by the Corps of Engineers, a total of 76 commercial businesses, 24 residential structures, and five public utilities may be affected by a flood exceeding a 25-year frequency. Plate 1 shows the limits of the 500-year and SPF floods.

Directly behind Panorama Plaza, over Irondequoit Creek, is an access bridge which provides a connecting link between the plaza and the industrial area on the left bank. The underlying culverts are inadequate for channel capacity flow as determined during hydraulic investigations (see photo 9). The bridges on Old Penfield Road and Plaza Extension Road appear to hinder flow at times of low water stages. Both bridges were analyzed for possible removal (see photo 10).

Further investigations of the Panorama Plaza area and possible alternatives will be discussed in the formulation section of this report.

BUSHNELL BASIN

Bushnell Basin (area 13) is located in the town of Pittsford. Irondequoit Creek passes under the Barge Canal through two 9' X 12' box culverts. There is a significant reduction of flow through the culvert, causing water to pond against the high embankment of the Barge Canal on the upstream side of the crossing, creating a dam affect. The additional head thus created by the dam affect further increases the already high velocities in the culvert.

Extensive erosion occurs just downstream of the culvert due to the high existing velocities from the culverts both at low and high flood stages. A flooding problem is caused by debris coming downstream at high velocities and creating debris jams near the creek bend above the culvert and at the culvert.

Conversations with local residents revealed that the creek reaches bankfull stage yearly. Localized flooding occurs but creates little physical damage to the homes in the area. The eroded streambank can be protected by installation of a riprap or gabion revetment and the water velocity can be controlled by construction of a stilling basin downstream of the culverts under the canal. A debris retention structure, properly maintained upstream of the culverts, would also be worthwhile.

Upon further investigation, it was determined that the Corps of Engineers has no authority to provide funding for protection of erosion areas on private property. The Corps can only provide planning assistance and technical information to aid in the development and implementation of flood and erosion control measures. Therefore, structural alternatives for the Bushnell Basin area were not considered for further study in this report. Implementation of

the suggested improvements in the Bushnell Basin would be the responsibility of the non-Federal interests, and whether the improvements are implemented or not, they will not affect the recommended plan (Alternative B).

FUTURE FLOODS

Floods of the same or larger magnitude as those that have occurred could and in all probability will occur in the future. Larger floods have been experienced in the past on streams with characteristics similar to those found in the study area. Similar combinations of rainfall and runoff causing these floods could also occur in the study area. Discussion of the future floods in this FFR and future reports include those that have been designated as the Intermediate Regional Flood and the Standard Project Flood. The Intermediate Regional Flood is by definition a flood which is likely to be exceeded on the average of once every 100 years. It is important to note that while on a long-term basis the occurrence averages out to once per 100 years, floods of this magnitude can occur in any given year or even in consecutive years and within any given time interval. The magnitude of the Standard Project Flood is based upon an appraisal of the flows expected to develop with coincidence of the most critical climatic conditions that are considered reasonably characteristic of the study area. The Standard Project Flood will occur less frequently, but will be more severe than the Intermediate Regional Flood.

WATER QUALITY

Irondequoit Creek over the years has been plagued with increasing urban development and improperly treated sewage effluents. Ten sewage treatment plants within the basin dump nine million gallons per day of sewage effluent into the creek's waters. This represents about 10 percent of the creek's normal daily flow of 90 mgd. In addition, deicing salts are used heavily on the roads of the county. In 1969-1970, it was estimated that 1 percent of all deicing salts used in the country were applied to Irondequoit Creek Watershed roads. Much of the sewage effluents and deicing salts eventually reach Irondequoit Bay, creating serious water quality problems in the bay. In more recent years, newly constructed sewage treatment facilities have started to divert much of the effluent away from the creek and bay water. Water quality has improved and will continue to improve in the future. The town highway departments have been reducing the amounts of salt they use on the road in recent years.

In spite of the past water quality problems, Irondequoit Creek does support significant fisheries for both rainbow (steelhead) and brown trout.

Section 208 of the Federal Water Pollution Control Act of 1972 (PL 92-500), as amended by the Clean Water Act of 1977 (PL 95-217), gives authority to States and/or designated metropolitan areas within a State to conduct the planning. The law is administered by and chiefly financed through the U.S. Environmental Protection Agency. The Department of Environmental Conservation (DEC) of New York State was selected as the 208 planning agency by the Governor of New York. The DEC is working jointly with Monroe County in studying the Irondequoit Creek Watershed.

This multi-year study for the Irondequoit Creek Watershed was initiated during Federal fiscal year 1980, with primary funding from EPA through its NURP program and the Federal 208 Program, will address the urban runoff and other nonpoint source urban runoff pollution problems in the Irondequoit Creek Watershed. As proposed, the study has two main objectives: (1) to determine the level of urban runoff pollution and (2) to determine the effectiveness of various management techniques for minimizing nonpoint source pollution. Part of the study will involve monitoring the water quality in several areas of the watershed to determine the specific nature and magnitude of the nonpoint source pollution problem. Also, several control measures aimed at reducing this pollution will be evaluated, including the development of multiple use reservoirs along Irondequoit Creek. In developing a water quality management plan for the watershed, the main emphasis will be on local regulations and small-scale structural improvements.

LAND USE MANAGEMENT

Increases in population and affluence leads to increased demand placed upon land use and accompanying services. These demands include residential development, recreational facilities, highways, and other forms of development or land allocation that alter the natural environment of the area. These alterations can cause increased potential for flooding and deterioration of water quality.

Growth in the Irondequoit Creek Watershed was based primarily on individual municipal planning and, therefore, did not reflect basin-wide interests, considerations, or effects. Because of this approach, the Irondequoit Watershed has experienced the effects of erosion, sedimentation, and an alteration of flow characteristics.

In order to analyze the dynamic nature of the developing Irondequoit Creek Watershed, consideration was given to using water resource management tools to monitor land use changes within the watersheds, identify their implications, and evaluate the overall situation so that they can be included in policy decisions of local Government agencies. The Corps Hydrologic Engineering Center (HEC) had recently developed automated systems known as Spatial Analytic Methodology (SAM), which is designed to quantify these land use impacts.

The Corps of Engineers, Buffalo District, initiated a computerized model study (SAM) for the Irondequoit Watershed area in FY 78 by submitting a supplement to the Plan of Study.

The main purpose of a SAM-type study is to provide broad long-range information for land use decision makers. The following information would be available through a SAM-type study:

a. Existing and expected annual damages by reach. Damages over an entire reach would be tabulated, not any specific locations. These values are not of the accuracy needed for engineering decisions but do provide relative information for planning policy decisions. Such decisions would include slope/soil development constraints and flood plain development constraints.

b. Existing and expected flood heights for broad planning purposes as mentioned above.

c. "Spinoff" information would include the following general planning information:

(1) Base information for relating water quality to land use.

(2) Various land use tabulations which may be helpful to planners, e.g., wetlands, steep slopes, forestland, erosion potential, etc.

(3) Environmental attractiveness for new development. This involves automated "weighing" of certain considerations often considered in site planning.

(4) Regional detention analysis. A conceptual approach to location and sizing of this type of facility. A special study would still be needed to verify results but a broad basic plan could be developed.

It should be noted that this system of analysis was developed for continuing use. When properly maintained through land use updating from the communities, this system could economically provide predictions for changing conditions.

The problem of lack of support by local agencies began to be recognized while the draft supplement was being prepared. Downstream towns of Penfield and Brighton were the only strong supporters of the study. The other five major towns were interested but expressed doubts as to the usefulness of such a study.

To measure the local support, the Buffalo District on 22 May 1978 sent out a request for a $1,000 commitment from the town board of each of the seven major towns. This token amount was to defray any local costs associated with the update and operation of the SAM computer model. It was decided that each town would have to respond favorably or the study would be dropped.

Only three of the seven towns responded favorably. They were the downstream communities of Penfield, Brighton, and Pittsford. The reasons for nonsupport by the other towns were as follows:

a. Too much Federal Government interference already.

b. Future land uses are better planned by the local governments.

c. The study does not aid upstream interests.

d. Money should be spent on clearing and snagging.

e. The model study is too sophisticated and complex to understand or use.

f. Local engineering drainage studies would be more beneficial.

g. The model study is too expensive.

h. The Irondequoit Creek Watershed has been thoroughly studied in the past.

This response is clear evidence that the majority of the towns are not in favor of a model study, SAM. One of the underlying reasons for these types of responses may not be clear. That is the watershed does not have a regional land use agency that can regulate developments. This regulation authority lies with the individual towns and these towns want as little outside influence as possible in these matters. For the Government to propose a watershed technique such as SAM would involve at least the approval of the seven major towns and involvement by them in the basin-wide analysis.

The point is that an overall authority for land use planning must be identified before a study such as SAM is initiated. This type of authority does not exist in the Irondequoit Creek Watershed.

It should be noted that at one time such an authority did exist for most of the watershed. It was called the Monroe County Drainage Authority but its operating capability was taken away over 10 years ago largely because of the towns' concern with interference in land use planning.

Due to the negative response, the Corps of Engineers, Buffalo District, dropped from further consideration all investigations for an SAM model study of the Irondequoit Creek Watershed in September 1978. It was at this time that the supplement to the Plan of Study was withdrawn.

FORMULATING A PLAN

GENERAL

This section presents the plan solution process and outlines the basic criteria used to formulate a plan for responding to the problems and needs discussed in the preceding section of this report. Alternative plans are presented and evaluated to determine their benefits or adverse effects upon the study area.

In formulating a plan to reduce flood damage, standards, and procedures as set forth in various flood control acts and policies and related regulations established by the Corps of Engineers through experience in the flood protection field have been followed. Examples of specific guidance followed include: the Federal Water Resource Council's "Principles and Standards for Planning Water and Related Land Resources;" the National Environmental Policy Act of 1969 and related ER 1105-2-507; ER 1105-2-200 as related to implementation of "Principles and Standards" and other related requirements; ER 1105-2-105, "Guidelines for Assessment of Economic, Social, and Environmental Effects of Civil Works Projects;" and draft ER 1105-2-353, "Evaluation of NED Benefits and Costs for Exacavation and Relocation as "Non-Structural Measures for Flood Plain Management."

NATIONAL OBJECTIVES

NATIONAL ECONOMIC DEVELOPMENT (NED)

Enhancement of national economic development as defined by the Water Resources Council, is achieved through optimum development of water and related land resources. The present and projected needs should be assessed in terms of the relationship to flood control and related water resource development. The annual costs of the measures for various purposes should be compared with the annual benefits in order to evaluate plans on the basis of economic efficiency.

ENVIRONMENTAL QUALITY (EQ)

Maintenance or enhancement of the quality of the environment is achieved by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems. Among the major components of the environmental quality objective considered include: (1) natural environment, (2) open and green spaces, (3) cultural resources, (4) fish and wildlife, and (5) scenic values. The impact on the fish stocking program could be an item of consideration related to the environmental quality objective. The potential impact of stream alteration measures on wetlands, aquatic life, cultural resource sites, and potential induced future development are among the major considerations in selection of a viable alternative.

PLANNING OBJECTIVES

Planning objectives are to enhance the NED and EQ by the management of the water and related land resource needs on the national, State, and local levels.

The Planning objectives to be addressed in this report for a 1980-2030 period of analysis are as follows:

a. To promote flood management techniques to reduce future flood damage economic losses in the Irondequoit Creek Watershed;

b. To provide flood damage reduction measures to protect health, life, and property in the Panorama Plaza area, Penfield, NY, of Irondequoit and Allen Creeks;

c. To provide erosion and sedimentation control to protect stream banks and prevent damage to adjacent property in the Panorama Plaza area of Irondequoit and Allen Creeks;

d. To improve fisheries and wildlife habitat for environmental enhancement in the Panorama Plaza area of Irondequoit and Allen Creeks;

e. Preservation of significant cultural resources to protect the heritage of the Irondequoit Creek Watershed area;

f. Improve water quality, for game fishing purposes, by reducing siltation from bank overflow and erosion in the Panorama Plaza area; and

g. To develop recreational opportunities in the Panorama Plaza area for social enhancement when environmentally and economically feasible.

EVALUATION CRITERIA

The formulation, evaluation, and screening alternative plans has been done within the context of the planning objectives and technical, economic, environmental, and other criteria described in this portion of the report. These objectives and criteria, and other intangible considerations, provide the framework for the development and selection of a range of feasible plans which best respond to the problems and needs and economic feasibility. The objectives not only reflect national development and environmental quality objectives but also the objectives of local, State, and regional interests.

TECHNICAL

One of the basic criteria is that a plan of improvement, through adequate research and testing, provide a nonstructural or structural alternative to meet the planned needs of the basin and to reduce the hazards of loss of life and damage to property. The technical criteria will consist of complying with appropriate engineering standards, regulations, and guidelines to meet the needs of the affected communities. The project must be complete within itself and not require any additions thereto over the project life. It must

be physically capable of being built and be in general concert with water and related land resource programs of other agencies.

Water damage associated with natural streams or modified natural waterways may be addressed under the flood control authorities downstream from the point where the natural flood discharge is greater than 800 cubic feet per second for the 10 percent flood (one chance in 10 of being exceeded in any given year) under conditions expected to prevail during the period of analysis. Irondequoit Creek has a flow greater than 800 cubic feet per second for the 10 percent flood at the locality of Panorama Plaza, Penfield, NY.

ECONOMIC

This criteria consists of identifying and comparing benefits, where applicable, and the costs of an alternative to select plans based on economic efficiency. The evaluation process will be based on the maximization of net benefits. The types of flood plain utilization in the Irondequoit Creek flood plain are expected to change very little during the years from present to 2028. However, benefits from the proposed plan of improvement would be accrued by both present and future occupants. Benefit categories include flood inundation, damage reduction, and possible intensification of commercial and industrial activities. The flood reduction benefit is that value of future damages that would be prevented by a flood control project. The benefit is measured by subtracting damages occurring with a project from those damages expected without a project. Annual costs are based on an interest rate of 7-3/8 percent, a 50-year amortization schedule, and price levels and conditions existing in March 1981.

ENVIRONMENTAL

All plans of improvement should avoid or minimize objectionable or adverse impacts to aquatic or terrestrial habitat, and maximize environmental benefits prior to, during, and following construction. A plan should avoid or minimize water pollution and aesthetically objectionable features. Adherence to these criteria will result in public acceptance and reduce difficulty in obtaining the necessary assurances of local cooperation.

This report will consider the preservation and enhancement of natural and cultural areas, and scenic values. In conjunction with the above, the creation, preservation, or enhancement of scenic and recreational areas will be considered when related to the primary objective, flood management. The evaluation will be based on known and potential uses within Irondequoit Creek Basin.

In addition, the National Environmental Policy Act of 1969 requires assessment of plan impacts. In accordance with this act, all available means will be utilized to promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other needs of present and future generations.

SOCIAL WELL-BEING

Social well-being is the beneficial and adverse social effect that contributes to or detracts from the equitable distribution of real income and employment and other social opportunities. The well-being of all concerned and involved people will be an important determining factor in considering the best use of water and related land resources. Alleviation of specific problems and fulfillment of the needs of particular interest groups within the general public will be considered. However, care will be taken to avoid resource use and development that benefits a few at the disadvantage of many. Investigations will determine the social impact of both structural and nonstructural measures for flood management and other related water resource developments.

REGIONAL DEVELOPMENT

Regional development is the relationship of the enhancement of a region with respect to employment and economic stability for each plan of improvement.

The regional development of the area will consider provision of low-hazard flood plain development opportunities made available by structural or alternative means for increased business and agricultural production, and accompanying employment and income. At present, the study area is not designated as a qualified redevelopment area by the U. S. Department of Commerce, Economic Development Administration; however, areas immediately adjacent to the project area are qualified and any effect on these areas will be evaluated.

Public acceptability of a plan is determined by analyzing its acceptance by concerned local interests. A plan is acceptable if it is, or will likely be, supported by a significant segment of the public. However, every attempt was made to eliminate, to the extent possible, unacceptability to any significant segment of the project.

POSSIBLE SOLUTIONS

After analyzing the problems and needs of the Irondequoit Creek Watershed, several possible plan elements and measures were developed and considered. These elements and measures were then evaluated and those that appeared to fulfill the national and planning objectives were considered further. The plans developed include the national objectives of NED and EQ.

In any formulation, there is always the basic question of: "Is there a justified need for change?" Therefore, no action was considered. It would maintain existing environmental quality, but fails to meet the economic criteria and planning objective for the area. The no action plan will not provide any form of flood protection or management for any of the floodprone areas in the Irondequoit Creek basin. The no action plan does not meet the planning objectives, outlined in the previous section, to satisfy the needs of the basin. Therefore, no action by the Corps of Engineers is not recommended.

EVALUATION OF ALTERNATIVES

GENERAL

Recent floods since 1960 have centered most of the damage in the Panorama Plaza area in the town of Penfield. Therefore, structural alternatives (reservoirs, diversion channels, levees, flood walls, berms, or channelization) were considered to provide flood control in the plaza area. No action and nonstructural alternatives will be mentioned for the plaza area, but will be described in more detail for the remainder of the watershed. Nonstructural alternatives include floodproofing, flood insurance, flood warning, and permanent flood plain evacuation.

PANORAMA PLAZA AREA

General

The detailed hydrologic and general hydraulic considerations were performed for Irondequoit Creek and Allen Creek. Three reaches have been analyzed and are similar for all the alternatives investigated. Reach 1 originates at the confluence and continues downstream on Irondequoit Creek for approximately 3,000 feet. Reach 2 begins at Route 441 and continues downstream for approximately 2,900 feet on Irondequoit Creek to the confluence with Allen Creek. Reach 3 extends from the confluence of Allen and Irondequoit Creeks, upstream on Allen Creek for approximately 1,000 feet. The confluence of Irondequoit and Allen Creeks is approximately 600 feet downstream on Irondequoit Creek from the center of Panorama Plaza. Water surface elevations for the 50-year, 100-year, and 500-year floods along with the Standard Project Flood (SPF) were analyzed. The SPF is considered to be a flood with the greatest impact on the area. As a result of improvements hindering the natural drainage to Irondequoit and Allen Creeks, interior drainage must be included as part of all improvement plans.

Alternative A - No Action

This alternative provides a plan of no action. This is not a viable solution for the Irondequoit Creek flood problem, since flood damages would still occur. Further development and encroachment into the flood plain will reduce the natural storage capacity of the basin, thereby increasing the damages assessed due to flooding.

It is important for the town of Penfield to continue to enforce flood plain regulations regardless of any improvements by the Corps of Engineers.

Alternative B - Levee and Floodwall

This is a structural alternative that would provide flood damage reduction with both levees and floodwalls. In this alternative, the structures are set back from the creek banks to provide a flow channel with a larger cross sectional area. The difference between the water surface elevation and the existing bank elevation established the levee and floodwall heights. Freeboard was added to the heights of the major levees and floodwalls. The

levees were placed wherever there was sufficient land width, otherwise floodwalls were used in constricted areas. The levees were given primary consideration over the use of floodwalls due to their lower cost. This alternative was designed for varying degrees of projection, using 50-year, 100-year, 500-year, and Standard Project Flood (SPF) levels of protection. Plate 2 details the levee/floodwall alternative that would provide 100-year protection. Plate 3 details the levee/floodwall alternative for the Standard Project Flood (SPF) level of protection.

With the construction of levees and floodwalls, natural drainage to Irondequoit and Allen Creek in the study area will be restricted. An internal drainage system is needed as part of the plan to meet drainage requirements for the Panorama Plaza area.

The Panorama Plaza Extension Road Bridge and the Old Penfield Road Bridge obstruct low design flows. However, during high flows, the flood waters flow over and around the bridges. The bridges act as natural drop structures, and would provide some reduction of the erosive velocities in the channels. Because of the velocity reducing characteristics, it is recommended that the bridges remain over the channel for Alternative B.

Alternative B will be discussed further in the ensuing sections of this report.

Alternative C - Channel and Berm

This alternative would provide both channel and berm improvements. The channel/berm improvement is a variation of the levee/floodwall plan. Plate 4 indicates the berm locations and the extent of channelization for the 100-year protection along Irondequoit Creek for Panorama Plaza. In the channel/berm plan, a wider channel permits the use of berms to replace their larger counterparts - levees. This has the advantage of lower costs and removes the need for a high or access-restricting levee or floodwall. Improved channel dimensions and grades to produce nondamaging stages were established by using a cross section method and the backwater computations. The improved channel dimensions consisted of increasing the width, depth, and cross sectional area of the average channel. Increased channel capacity through channelization alone was desired. Man-made constraints, such as closeness of buildings and roads to the creek, would not always permit it and restricted the various levels of protection. Existing structures, overbank topography, and the natural features of the two creeks eliminated the strict channelization plan (no berm) from consideration. Since it is necessary to maintain the channel capacity throughout the study area, an average channel size that was widely applicable was established. In those areas where the improved channel was not sufficient, berms are proposed to be constructed along the banks to give additional height required, to prevent overtopping into the plaza area.

For the channel/berm improvements examined, three separate reaches were considered. The first reach begins approximately 3/4 of a mile downstream of the Old Penfield Road Bridge and extends upstream to the confluence with Allen Creek. The proposed channel dimensions for this reach have a bottom

slope of 0.87 percent and a bottom width of approximately 100 feet. The second reach continues from the confluence with Allen Creek upstream to the Route 441 Bridge. The proposed channel dimensions for the second reach have a bottom slope of 0.22 percent and a bottom width of approximately 50 feet. The third reach would extend along Allen Creek from the confluence with Irondequoit Creek to a point approximately 1,000 feet upstream. The creek would be channelized along the existing grade and riprapped throughout the reach (sides and bottom) due to the high existing velocities that cause severe erosion.

In each channel reach, the cross sections were designed with a trapezoidal shape having sideslopes, 1 vertical on 2.5 horizontal. The channel alignments were based on topographical maps, utility location plans, aerial photos, field inspections, and design criteria. A freeboard of 2 feet was included in all computations. Berm design was based on the aforementioned levee design. The berm sections utilize a trapezoidal cross section having sideslopes, 1 vertical on 2.5 horizontal with a 10-foot wide crown. Using these sideslope dimensions, the berm would become a continuation of the sloping channel side.

The Panorama Plaza Extension Road Bridge and the Old Penfield Road Bridge will require removal to maintain a wide and uniform channel. This will eliminate vehicular access at the Plaza Extension Road and the Old Penfield Road. Major alternative routes to the Plaza area will still be maintained along Panorama Trail Road and Penfield Road.

The Harney Printing Shop would need to be acquired. It would not be practical to protect a building that is presently endangered due to its close proximity to the erosive bank.

Recreational facilities are proposed for the open area behind Panorama Plaza by the Penfield Parks and Recreation Department. The proposed town park would consist of two multi-use fields, a baseball diamond, and a playground/picnic area. Alternative C would have no adverse impact upon the proposed park. The development of a town park would be beneficial to the public and the plaza business owners. The use of low berms would not isolate the public from the aesthetics of Irondequoit Creek.

The construction of berms would prevent the natural flow of internal storm water from entering the creek. Preliminary plans for an internal drainage system were investigated for the project area. The internal flows would be collected by ditches along the backside of the berms and be retained at central collection points where the flow would exit through culverts with flap gates.

During the Stage 3 investigations, severe erosion problems were identified. The existing and with-project velocities were excessive for the soil conditions. The soil characteristics appear uniform throughout the project area. The creek banks consist of a fine sand layer with fine gravel and silt that are erodible when exposed to increased channel flows. Existing and/or planted riparian vegetation alone cannot be depended upon for reducing bank erosion. Serious toe erosion can lead to a washout of the vegetation.

Riprap will be required along the entire project length of Irondequoit Creek because the velocities exceed the allowable limits of 2.5-3.0 fps for sand and gravel banks.

This alternative will not be considered for further study for both economic and environmental reasons. In the previous Stage II document (Preliminary Feasibility Report), Alternative C had been selected as the NED plan, which is no longer valid.

The severe erosion problems identified by the geotechnical investigations resulted in the need for extensive riprap along Irondequoit Creek. The cost of riprap is expensive and would raise the total first cost of Alternative C. A detailed cost analysis was not completed in this Stage 3 investigation because Alternative C was not considered a viable solution. A rough cost estimate was made based on updated costs provided in the Preliminary Feasibility Report and on the cost of erosion protection measures. This alternative would have a benefit/cost ratio far below unity (1.0) making it not economically justified.

Alternative C is also not environmentally acceptable due to the extensive channelization and riprap placement that would significantly impact aquatic habitat. Widening the channel would destroy the riparian vegetation which would reduce the shade cover and food supply for fish species. Deepening of the channel would temporarily increase turbidity which could disrupt fisheries and cover of some existing benthos. Long-term adverse impacts, as a result of deepening, would be the destruction of natural riffle-pool areas utilized by fish as feeding and cover habitat. Placement of riprap would destroy all existing aquatic vegetation along the bottom and sides of the channel.

This alternative is not considered for further investigation based on the above findings.

Alternative D - Channelization

This is a structural alternative that would consist only of channelization to provide flood control. Because of its relatively low cost, channelization was the most desirable of all the alternatives considered initially. Because of the restrictive elevations of underlying rock layers, bottom excavation of the channel bottom had to be kept to a minimum. This depth restraint resulted in a channel top and bottom width that would be prohibitively wide. A number of buildings in Panorama Plaza, because of their close proximity to the channel, would have to be relocated. In addition, the channel bottom width would interfere with the 54-inch diameter Monroe County Pure Water's sanitary sewer interceptor, which roughly parallels Irondequoit Creek. The above-mentioned restrictions render Alternative D impractical for further study.

Alternative E - Diversion Channel

This is a structural alternative that would provide a diversion channel for flood protection. The diversion channel is considered initially as another

low-cost improvement. The channel would divert stream flows past the Panorama Plaza area without damaging stages. The proposed channel would diverge just upstream of Panorama Trail, running parallel to the existing Irondequoit right bank, under Panorama Trail, behind the main plaza, and reconverging with the existing channel just upstream of the Penfield Road Bridge. This alternative would involve relocating at least one building and the existing 54- and 72-inch diameter sanitary interceptor line. This plan would also involve moving the confluence of Allen Creek 500 feet downstream on Irondequoit Creek. The land acquisition of private property would be costly. Due to the numerous restraints and secondary costs involved, Alternative E was not considered further.

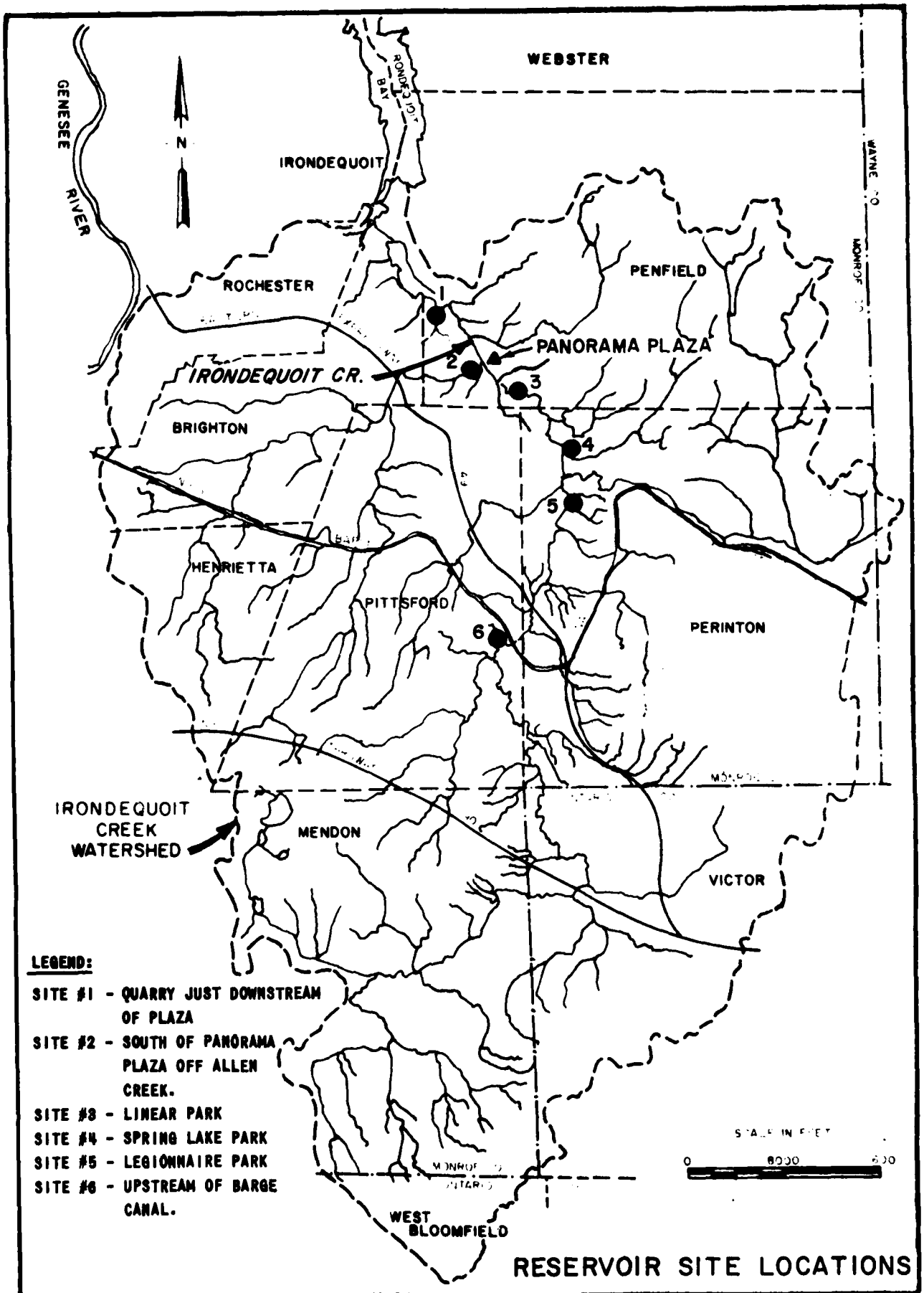
Alternative F - Reservoirs

This is a structural alternative that would utilize reservoirs to provide flood protection to downstream reaches. Initially, 15 reservoir sites in the Irondequoit Creek Watershed were selected for investigation based primarily on location without consideration of their resulting impact. The locations were evaluated upon the following criteria: location with respect to residential areas, drainage areas, stream control, political boundaries, available storage capacity, and type of land available. Nine of the original 15 sites were eliminated immediately because of the adverse impacts they could create. The remaining six reservoir sites, shown on sketch 5, were investigated further to compare their hydraulic storage capacities. The results are detailed in Table 6. All of the six sites have insufficient capacity to be effective alone. However, two sites, No. 3 Linear Park and No. 6 Barge Canal, could be used in conjunction with other structural measures. The cost of constructing and maintaining the reservoir are considerably higher than other flood control measures, therefore, Alternative F was not considered a viable alternative, either alone or in combination with other flood control measures.

Alternative G - Nonstructural

This section will address the aspects of possible nonstructural measures for the Panorama Plaza area. Nonstructural measures for use in flood management have two general functions; to protect against flood-related losses at individual sites, and to reduce overall need for flood protection. Flood warning and emergency action, floodproofing, and flood insurance are designed to partially protect against flooding at specific sites that are highly susceptible to flood damage. Flood plain management and permanent evacuation reduce the need for flood protection by regulating flood damageable uses, but provide no protection for existing development. Five kinds of nonstructural measures were investigated.

Flood Warning - Flood warning requires installation of a flood warning device that would be situated far enough upstream in the watershed to allow sufficient time for coordinating agencies to warn downstream communities. To be effective, a long advance warning time would be necessary to evacuate floodprone areas or to erect flood protection devices at susceptible structures. The shortness of the warning duration in the Irondequoit Creek Watershed would not allow time to erect flood protection devices (sandbags,



RESERVOIR SITE LOCATIONS

SKETCH 5

Table 6 - Reservoir Site Comparison - Available vs. Required Storage

Reservoir Site	Location	Drainage Area	Available Storage	Required Storage For 1" Runoff	Required Storage For 2" Runoff	Required Storage For 3" Runoff
No. 1 Quarry	On Irondequoit Creek, downstream of Old Penfield Road.	130	1,322	6,933	13,867	20,800
No. 2 Sybron/Nalge	On Allen Creek, behind Sybron/Nalge factory, just upstream of Irondequoit Creek.	28	430	1,490	2,990	4,480
No. 3 Linear Park	On Irondequoit Creek, just upstream of the Route 441 bridge.	100	430	5,330	10,670	16,000
No. 4 Spring Lake Pk.	On Irondequoit Creek, just upstream of the Linden Avenue bridge.	92	770	4,910	9,815	14,720
No. 5 Legion-Eyre Pk.	On Irondequoit Creek, at the Thomas Creek confluence.	87	595	4,640	9,280	13,920
No. 6 Barge Canal	On Irondequoit Creek, on the upstream side of the Barge Canal crossover of Irondequoit Creek.	50	770	2,660	5,330	8,000

Note: Drainage areas are in square miles.
Units of storage are in acre-feet.
Amounts of storage are based on preliminary computations only.
Available storage is based on existing conditions.
Required storage does not take existing channel storage into account.
Available storage for site No. 1 quarry is an estimate.
Only a surface area of 33.1 acres is known. The amount of 1,322 is based on a uniform depth of 40' with the quarry having vertical sides.

floodshields), but could allow sufficient time for evacuation. A possible adverse situation would be that residents would be inclined to stay in floodprone areas after implementing emergency floodproofing measures. In a serious flood, these people could suffer greater loss than if they had simply evacuated. Currently, there are no coordinating agencies or system available to interact at any time, day or night, to warn downstream communities. The Panorama Plaza area consists primarily of commercial buildings with several apartment complexes, and several light industry buildings. This particular land use, unlike a residential area, would not have an owner available at all times to implement emergency floodproofing or temporary evacuation. Police, public works crews, and highway crews are usually summoned to the area only as the flood occurs, to blockade flood areas and evacuate flood victims. There is no central committee to provide early warning and provide evacuation assistance to coordinate local town department efforts.

The shortness of the warning duration, absence of coordinating agencies, and the impractibility of providing rapid floodproofing measures in the plaza area would make flood warning an impractical measure. This aspect of the nonstructural alternative will not be considered further in this study.

A floodwarning system for evacuation only will be considered further for the Selected Plan. Stream and rainfall gages would be connected to an alarm system at the police headquarters. The police would have time only to enact evacuation measures prior to a potentially catastrophic flood.

Floodproofing - Floodproofing could protect to some extent life, health, and property. This measure would be dependent upon an efficient flood warning system to be effective. An early warning time is necessary to provide sufficient time to implement temporary floodproofing measures. Due to the small size of the watershed, the lag time of peak flows is too short to allow the required time.

Floodproofing could be either permanent (blocking windows, constructing levees, or floodwalls, etc.) or temporary (sandbags, floodshields, etc.). The degree of protection would depend on the depth, duration, and speed of flood flows and the amount of debris carried by them. Serious flooding could strand people for extended periods in floodproofed structures, cutting them off from necessary supplies and services. Hydraulic loading of floodwaters against the walls of floodproofed structures could cause them to collapse, resulting in greater damage than might have occurred without floodproofing. Fast-flowing and/or debris-laden flood currents could cause considerable damage to floodproofed structures, reducing the supposed benefits of the floodproofing measures.

Floodproofing of the Brookhill and Penfield Apartments would be impractical due to the many basement apartments with windows at ground level. Many of the stores in the plaza have two entrance glass doorways, large glass windows, and unsealed loading docks. This makes the stores very immune to the large loads that could be induced by floodwaters even if the floodshields are in place. The sealing of all openings would be unrealistic, while the planning, coordination, and time constraints of placing temporary shields and sandbags would also be impractical.

This nonstructural aspect will not be considered further due to the numerous constraints restricting its effectiveness.

Permanent Evacuation - Permanent evacuation of the area proved to be the most effective plan to reduce flood damage while it was also the most expensive plan. Permanent evacuation of the developed flood plain involves the acquisition of lands by purchase, removal, and relocation of improvements, evacuation, and resettlement of flood plain residents, and permanent conversions of lands to uses less susceptible to flood damage. Movement out of the flood plain would result in a natural habitat improvement in the evacuated areas. The strongest opposition to this plan comes from individuals with investments in local businesses and real estate. An evacuation of the plaza would pose inconvenience for many and economic hardships for some of the business owners. The costs of permanent evacuation would be prohibitive for implementation.

A rough preliminary cost study for permanent evacuation of the buildings in the Panorama Plaza area indicated it would cost over $35 million for acquisition only. This would make this measure economically impractical. This aspect of the nonstructural alternative will not be considered further due the high cost and the extreme adverse impacts upon the social well-being and regional development. Partial permanent evacuation was utilized in Alternative B, a structural levee/floodwall plan. A detailed description of the buildings and lands that would be acquired for Alternative B is described later in this report.

Flood Insurance - Flood insurance provides some financial protection to victims of flood related property losses, but does nothing to prevent such losses.

In the 1968 National Flood Insurance Act, Congress designated the Secretary of Housing and Urban Development (HUD), to establish and prosecute a National Flood Insurance Program to promote regulation of uses of lands susceptible to special flood hazards, to curb risks of future flood damage, and to afford Federally insured flood insurance at low premium rates. The amended law provides that such insurance is to be made available under the program only to those communities having assured the Secretary that they would develop, by 30 June 1975, adequate regulations governing use of all lands under their jurisdictions susceptible to special flood hazards.

Because local response to provisions of the National Flood Insurance Act of 1968 was generally apathetic, Congress later enacted the Flood Disaster Protection Act of 1973. In this act, Congress stipulated that a community having jurisdiction over lands susceptible to special flood hazards could not receive Federal assistance of any kind unless it participated in the flood insurance program established by the 1968 Act, and that an owner of flood damageable property within such lands, could not receive assistance of any kind from the Federal Government (or any agency or institution supervised, regulated, or insured by the Federal Government) in acquiring or improving such property unless he purchased flood insurance to protect it. The town of Penfield, along with most of the other towns in the Irondequoit Creek Watershed, is enrolled in the flood insurance program as shown in Table 7.

Table 7 - National Flood Insurance Program
Irondequoit Creek
As of March 1979

Location	Phase 1/	Study Date Completed
Monroe County		
Rochester - City	R	November 1978
East Rochester - Village	2/	January 1977
Pittsford - Village	E	January 1976
Fairport - Village	E	January 1975
Pittsford - Town	R	August 1978
Brighton - Town	R	June 1980
Penfield - Town	E	March 1973
Perinton - Town	R	August 1978
Henrietta - Town	R	November 1980
Irondequoit - Town	R	November 1978
Mendon - Town	E	April 1975
Ontario County		
Victor - Town	E	July 1975
West Bloomfield - Town	R	January 1977
Wayne County		
Macedon - Town	E	September 1975

1/ E - Emergency Program R - Regular Program
2/ Not in Program but has had a Special Flood Area Identified.

The town of Penfield is currently enrolled in the emergency program and should be working toward enrollment in the regular program. Flood insurance is a valuable tool for promoting flood plain management techniques in he study area, therefore, this nonstructural aspect will be considered further in the ensuing sections.

Flood Plain Regulations - Flood plain regulations are for managing measures land use to prevent or reduce future flood damageable development in flood plains. Flood plain regulations do not address the problem of damageable structures already in the flood plain.

One intent of the National Flood Insurance Program, discussed above, is to encourage communities to adopt effective flood plain management regulations. By means of zoning laws, building codes, and subdivision regulations, a flood plain management program would prevent highly damageable uses of floodlands, while permitting less susceptible uses such as recreation. Regulations keeping obstructive developments out of floodways, would not only prevent damages to such developments themselves, but would also prevent flow obstructions which might raise stages and worsen flooding upstream. Perpetuation of such undesirable development could be prevented by regulations permitting local governments to acquire such flood susceptible property for flood compatible purposes, or to require that new developments be flood-proofed. Since flood plain management regulations and flood insurance zones are based on a 100-year frequency of flooding, any structural measures which reduce the 100-year flood plain would also affect flood plain management regulations.

Flood plain regulations are currently being implemented in the town of Penfield in the form of zoning ordinances, building codes, and flood insurance enrollment. The town's utilization of flood plain regulations can be improved upon and will, therefore, be considered further in this study.

Of the five aspects of this nonstructural alternative, only two aspects (flood insurance and flood plain regulations) will be considered further. This portion of the nonstructural alternative will be carried into the system of accounts for further evaluation. The other three aspects were eliminated for the above stated reasons.

Recreational Development

Adequate park and recreational facilities and programs have a significant effect on the quality of life in a community. The town of Penfield offers a wide variety of recreational activities to its residents on a seasonal and year-round basis. The Parks, Recreation, and Youth Services Department works jointly with the Penfield Town Board and the Parks and Recreation Advisory Board to sponsor a comprehensive recreation program for all the residents of the town. Since 1956, the town of Penfield has had a citizen recreation board and a full-time director of recreation.

The Penfield Parks and Recreation Board sponsors a broad range of recreational activities throughout the year. The eleven member board decides on policy and sets goals and recommends funding levels. The board is appointed by the town board.

The recreation programs and facilities are administered by the Parks, Recreation, and Youth Services Department. The department employs an executive director, park foreman, and community education recreation coordinator and approximately 25 people on a part-time basis. The parks and recreation offices are located in the abandoned sewage treatment plant #1 building.

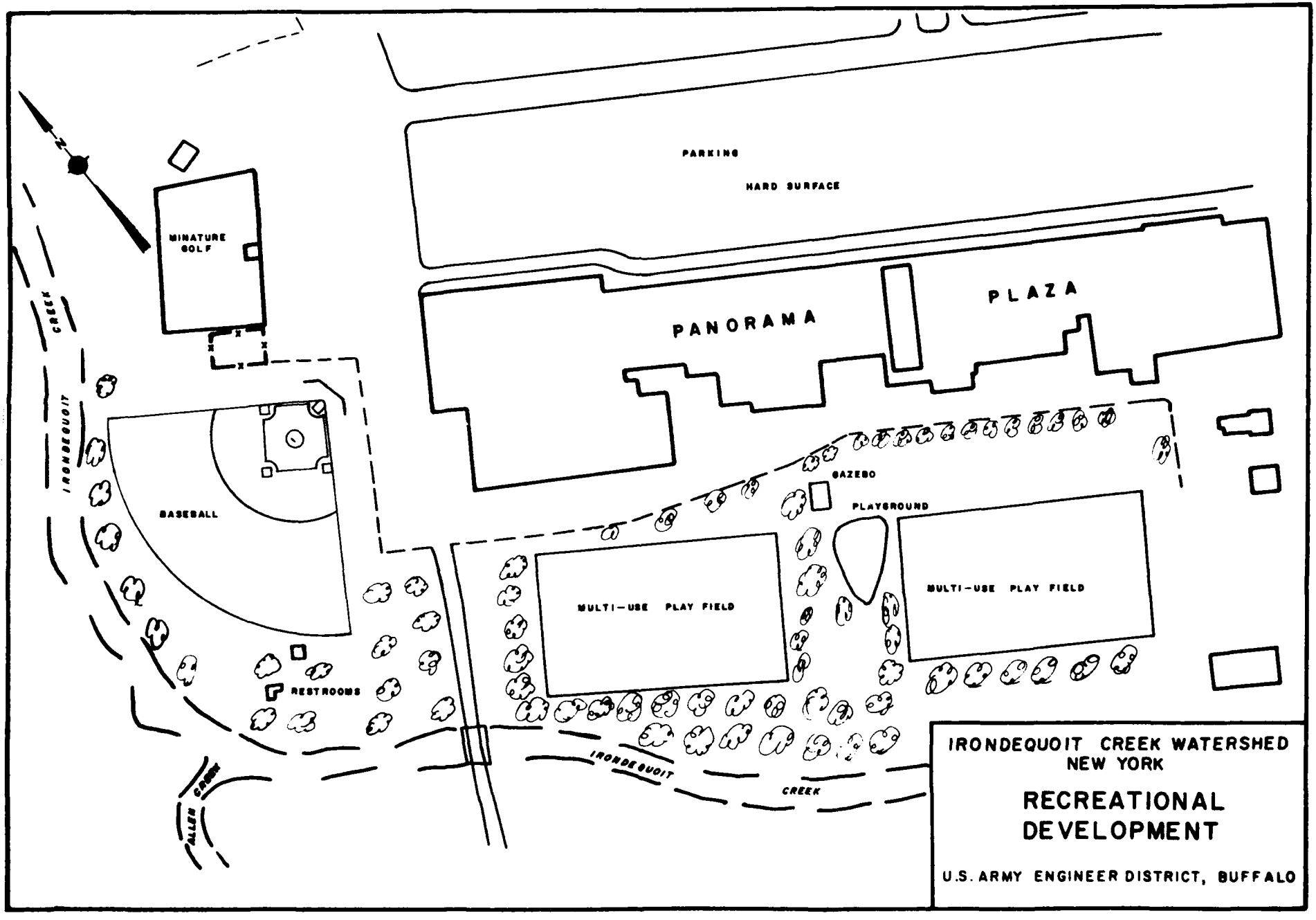
There are presently two major parks located along Irondequoit Creek in the close proximity of the Panorama Plaza area. Upstream of the Rt. 441 bridge to the Perinton town line, the town of Penfield operates and maintains Linear Park. This park consists of 18.5 acres along Irondequoit Creek with potential connections by trails to Spring Lake Park in Perinton. Facilities include a Braille trail and nature trails along the creek. Approximately 5 acres at and adjacent to the deactivated sewage treatment plant #1 at the west end is in the process of being developed for park purposes. Downstream of Panorama Plaza, past the quarry pond, Monroe County operates and maintains Ellison Park. The park contains 714.5 acres, of which approximately two-thirds are in Penfield. Ellison Park serves the Rochester Metropolitan Area as well as Penfield residents. Ellison Park has a variety of natural features including: the meandering creek; open level areas for baseball, tennis courts, and other games; wooded hillsides for hiking and nature study; and open slopes for sledding and tobogganing. Picnic areas with fireplaces, tables, and shelters are available.

Several private recreational sites are included within the study area. Camp Haccamo is located adjacent to Allen Creek near the Sybron-Nalge buildings. The day camp is operated by several Rotary Clubs of Monroe County and serves handicapped children from the Monroe County area. Some of the facilities provided are a small lake, swimming pool, cabins, dining hall, picnic shelters, and playground. The Genesee Conservation League is a private recreational facility located north of Old Penfield Road adjacent to Irondequoit Creek. The private facility contains a clubhouse, picnic shelters, archery range, rifle range, and indoor and outdoor pistol ranges.

The Panorama Plaza area, by implementing any of the previously described flood damage reduction alternatives, has potential for recreational development. The area located behind Panorama Plaza is currently undeveloped. Although structural flood control measures will consume some of the vacant area, a considerable amount of land would still be available for recreational purposes. Development of a park would best utilize the land by creating a low-damage flood plain.

The town of Penfield Parks and Recreation Department is currently in the planning stage to develop a town park in the open land behind Panorama Plaza. The park may be constructed in the near future. The preliminary plans indicate two multi-purpose fields, a baseball diamond, and a playground/picnic area. Sketch 6 shows the location of the recreational facilities that are proposed by the Penfield Parks and Recreation Department.

Utilization of the levee for recreational purposes (hiking/biking trail, bleachers) was considered during the early plan formulation stages and in the draft reports. However, because of continuing significant concerns


PARKING
HARD SURFACE
MINATURE GOLF
PANORAMA
PLAZA
GAZEBO
PLAYGROUND
BASEBALL
MULTI-USE PLAY FIELD
MULTI-USE PLAY FIELD
RESTROOMS
IRONDEQUOIT CREEK
ALLEN CREEK
IRONDEQUOIT CREEK WATERSHED
NEW YORK
RECREATIONAL DEVELOPMENT
U.S. ARMY ENGINEER DISTRICT, BUFFALO

SKETCH 6

pertaining to health and safety problems, maintenance problems/costs, and structural integrity concerns, this utilization will not be incorporated or encouraged in the final plans.

Aside from the increased picnicking and recreational opportunities, the influx of people would be an economic boost for the plaza businesses.

REMAINDER OF IRONDEQUOIT CREEK WATERSHED

General

This section will address possible nonstructural alternatives for the entire Irondequoit Creek Watershed and its floodprone problem areas, with the exception of the Panorama Plaza area, which was addressed in the preceding section. Structural alternatives for the entire watershed would be impractical and are economically unjustified. A description of the floodprone areas are presented in the Problems and Needs section of this report. The Problems and Needs section describes reasons why structural alternatives were not considered for many of the floodprone areas. Many of the floodprone areas were found to be in remote areas that created little physical flood damage. Most of the flooded areas affected only private property. With the small amount of damage prevention benefits, structural flood control measures justification could not be economically justified and, therefore, lacked for a Federal project. The use of nonstructural alternatives to provide flood relief for the Irondequoit Creek Watershed will be investigated and presented in this section. In addition, institutional analyses are discussed for nonstructural implementation.

No Action

This alternative provides a plan of no action, whereby no measures are proposed to reduce or eliminate the flooding or its effects in the Irondequoit Creek Watershed. This is not a viable solution since flood damages would still occur. However, it would provide a basis to compare any investigated improvements.

Nonstructural

General

In accordance with Corps policy, equal consideration must be given to structural and nonstructural alternatives for flood damage reduction. Historically, structural protection has been emphasized, but this alone is no longer an acceptable approach due to recent emphasis on protection of the environment. Land management in general has become a more popular concept in the last decade, and flood plains are obvious candidates for land management.

The present shift away from traditional control techniques can be partly accounted for by the risk of catastrophic disasters, and the inability to predict future economic trends when working under traditional measures. Both structural and some nonstructural techniques are aimed at a "design storm." No matter how large the design storm is, it can be exceeded. Failure of some

structure such as a flood control reservoir can create much more serious problems than if there had been no reservoir at all. Levees as a protection measure have, according to some authorities, resulted in increased flood plain encroachment by people who had a faulty sense of security that the levees would never fail. Recent approaches to flood risk management seem to be biased against any alternative that has the potential of increasing flood flow (particularly if it could result in a serious flood wave) or encouraging increased usage of the flood plain by concerns highly susceptible to flood damage. Also, many traditional measures require large initial capital expenditures that require many decades to pay off. From a practical point of view, often it is felt that large structural flood control measures, if installed, commit the community to implicit reliance on them. Some of the nontraditional alternatives do not appear to require quite the same financial commitment but rather call for organizational capacity. Capital costs are often lower for these nontraditional measures, which would make them seem easier to discard if they proved ineffective. Changes in social attitudes, status of the environment, economic objectives, and physical character of the stream and stream flow require flexible planned programs. Many of the nonstructural approaches have greater flexibility than structural techniques because the time of implementation can be varied.

Nonstructural alternatives by Non-Federal implementation would be the most practical approach to addressing the flood problems contained in the major portion of the Irondequoit Creek Watershed. The watershed is a complex hydrologic network of streams that have isolated problem areas. Some of the areas are too small to warrant Federal investigation. All but one of the floodprone areas are not eligible for Federal funding for structural measures because of the lack of economic justification as discussed in the Problems and Needs section.

Nonstructural alternatives will be addressed in a general basin-wide description. Five nonstructural plans will be presented: flood warning, permanent flood plain evacuation, floodproofing, flood insurance, and flood plain regulation. Specific detail for providing a nonstructural plan for isolated areas cannot be provided because of the lack of available land use data.

Specific problem areas would require further investigations in conjunction with present and future land use data to gain an overall perspective of the entire watershed. This would help prevent the error of improving one area while causing adverse conditions in adjacent areas. A central committee or agency would need to be designated to coordinate and enforce flood plain management practices throughout the Irondequoit Creek Watershed. Otherwise, efficient management of the entire watershed would not take place.

Flood Warning

An integral part of a flood warning or emergency action plan is the installation of a flood warning device and developing a plan of action. Such a device would be situated far enough upstream in the watershed to give adequate time for evacuating floodprone areas or erecting emergency flood protection measures. However, power outages could cause the warning devices to be inoperative.

Flood warning is not a permanent solution, and, in fact, by itself cannot reduce losses at all. What it does do is buy time to evacuate or protect damageable property. Using this time depends on preparations made before the warning. A successful flood warning system relies heavily on the human and organizational capacity of the local community. If there is no existing organizational structure that a flood warning system can connect to, it probably could never be a significant part of a flood management program.

Flood warning systems rely heavily on interagency coordination, particularly in providing the public with accurate information. Misinformation, such as outdated news bulletins, can be worse than no information at all. The decomposition rate of a flood warning system can be extremely rapid unless some individual or group takes the responsibility to maintain it.

Much has been done to encourage the development of disaster plans, but little is available in the way of facilitating guidance and implementation. Civil defense and disaster preparedness agencies rarely have the capacity to deal with much more than evacuation and maintenance of basic services during the disaster. Techniques for estimating the effects of flooding on various activities in detail and designing realistic measures to respond to the threat are crude at best.

The National Weather Service probably has the greatest potential capacity to predict flood levels on the mainstreams in the Irondequoit Creek Watershed though the basin may be too small to provide accurate predictions.

The success of a flood warning system is greatly dependent on the type of storm producing the flood problem. Any particular area is usually more susceptible to the flood produced by one type of storm than others. For example, Hurricane Agnes was a slow moving, widespread type of storm, allowing ample preparation time for the major river basins. On the other hand, many downstream flood disasters are a result of thunderstorms that can occur with little warning. An alert received from the warning device must be transmitted to all concerned parties quickly and each party must act immediately. This system cannot positively guarantee flood protection, due to the flash type flooding that occurs in this relatively small watershed of Irondequoit Creek and flood waters would still inundate the areas surrounding the structures, perhaps trapping the residents inside.

Rates of rise for Irondequoit Creek are dependent upon the shape of the basin, antecedent conditions, intensity of the storm, development within the basin, and debris in the channel at the time of the storm. The duration of a flood is dependent upon the duration of the storm, the storage capacity of the overbank, prolonged runoff from snowmelt, and high stages caused by ice jams, etc.

It is impossible to predict accurate rates of rise and duration because many variations in rainfall distribution could produce a peak discharge with a variety of rise rates.

A study of the nature of flooding within the study area indicates that Irondequoit Creek through the study area is prone to rapid and dangerous

rates of rise. The rate of rise for flood conditions on Irondequoit Creek was estimated between 1.0 and 1.5 feet per hour, and flood conditions were estimated to last from one-half to one day. The rate of rise is considerably faster for Allen Creek due to the urbanized characteristics of its watershed.

Flood warning as a flood damage reduction scheme is believed to be more attractive to commercial or industrial interests than for residential because: they can usually organize and maintain an effective damage reduction system; and they can assign someone to oversee maintenance of the flood warning system. Developing the basis for technical assistance and research on the dynamics of managing flood risk within the structure of the firm is necessary to provide the basis for more effective public agency stimulation of desirable private responses.

The attractiveness of flood warning from an economic standpoint depends largely on the effectiveness of the evacuation and protection plans. Much of the flood damage in residential areas occurs to buildings and grounds that cannot be easily floodproofed or evacuated.

As an answer to the total flooding problem, this plan is a poor permanent solution because of the need for a central coordinating body, the shortness of warning time due to the relatively small size of the watershed, and the unreliable readiness of private homeowners to install temporary protection. However, in the absence of other flood control measures, a small amount of damage reduction could be afforded by this alternative.

Permanent Flood Plain Evacuation

Permanent flood plain evacuation of developed flood plain areas involves acquisition of lands by purchase, removal and relocation of improvements, evacuation and resettlement of flood plain residents, and permanent conversion of lands to uses less susceptible to flood damage. Contents and owners are relocated on sites less floodprone but with equivalent public services. The structures are purchased and destroyed or moved from the flood plain. The evacuated area is converted to a natural state by filling basements, removing debris, and reseeding. The Uniform Relocation and Assistance Act defines the amounts that must be paid for moving expenses and losses as a result of moving and relocation assistance. The implications of this law are important in evaluating the evacuation-relocation measure. Relocation programs are, and probably will continue to be, more difficult to implement than other nonstructural or structural measures because of the social and economic disruption which they entail.

This is the only nonstructural alternative that would permanently control the amount of flood damage. Movement out of the flood plain would result in the ability to restore the natural habitat in some of the evacuated areas and prevent the continual and gradual loss of flood plain forest acreage. Ecologically, this plan is very acceptable, since many of the ecosystems in the flood plain would recover and redevelop. However, as with flood emergency action, debris would be left on the overbanks after the floods receded. In addition, debris from the initial evacuation activity would leave a long-time scar on the flood plain unless substantial beautification actions were made part of the program.

Personal inconvenience to people now in the flood plain would be great but this might be offset by residents no longer experiencing flooding. This alternative would be unacceptable to many residents with strong ties to their present homes and community. Individuals with investments in local businesses and real estate that may suffer from a relocation would also be likely to oppose evacuation. Each individual floodprone area would need to be evaluated on a separate basis to determine the exact impact that permanent flood plain evacuation would cause.

Floodproofing

Floodproofing is an adjustment to a structure or its contents, or both, such that either floodwater is kept from the structure or, the damaging effects of floodwater entry are eliminated or reduced. Measures can be classified as permanent, contingent, or emergency. Permanent floodproofing measures do not depend on judgment, flood forecast, or warning to put the protection into effect. Contingent, or partial, measures are not effective unless, upon receipt of warning, some minimal action is taken to make them operational. Emergency, or temporary, measures are, upon receipt of warning, either improvised just prior to or during an actual flood or carried out according to an established plan of action.

Some examples of permanent measures are: (1) site elevation using fill or stilts (raising structures in place); (2) site protection using dikes or flood walls; and (3) structure protection using anchorage to resist buoyancy, sump pumps, sealing of floors or basement, and increasing the structural strength of buildings to withstand hydrostatic pressure. Examples of contingent measures would include: (1) structure protection through provision of closures for openings below the design flood elevation, protective coverings for appliances, etc.; (2) utility backup protection using valves; and, (3) intentional flooding with clean or floodwater to equalize hydrostatic pressures. Emergency measures would include: (1) site and structure protection using sandbags, and (2) contents protection by means of temporary removal to higher elevations (e.g., upper floors). In some cases, short warning times preclude use of all but permanent measures.

Floodproofing could require structural changes and temporary shields as a means of reducing flood damages. The level of design would be based upon the Regulatory Flood Datum (RFD). The RFD is defined in Federal Floodproofing Regulation EP 1165-2-314 as the height of the Regulatory Flood plus a freeboard factor of safety. For purposes of making an evaluation in this investigation, the Regulatory Flood has been assumed to be a 200-year event. Walls and floods below the RFD would be altered to improve structural strength and impermeability. Windows and low elevation would be sealed permanently, perhaps with glass blocks, and temporary removable shields would be placed on doorways or loading docks during flood times. The shields could be made of any structurally sound material that is easily moved such as aluminum or plastics. The shields would be stored as close as possible to the place where they would be used but hidden from view as much as possible. Quick attachment fasteners would be used to allow speedy placement.

A flood warning device would be necessary, and the successful use of the shields depends upon proper functioning of this warning device. Ample warning would have to be given to place the temporary shields in the various openings of the buildings. Most structures would still need to be evacuated, since residents would be stranded until floodwaters subsided. Structures would only be rated or modified based upon the ability to protect against the RFD. During floods greater than this, the rating would no longer apply.

Another method of residential floodproofing that could be evaluated consists of constructing a waterproof utility cell to house the furnace, hot water heater, air conditioner, and electric switchbox. The remainder of the basement could be utilized for storage but would be subject to flooding.

Another method of residential floodproofing consists of raising the structure by jacking the superstructure and constructing the foundation wall to design level. This method would not be applicable for many commercial buildings because of structural restrictions.

The environmental impact floodproofing would have on the flood plain would be primarily to the aesthetic qualities of the buildings involved. Windows would be bricked and shields stored on the property. As with other nonstructural plans, debris would remain on the overbank after the floodwaters receded, and shrubs, lawns, trees, and other natural features of the environment could be damaged temporarily.

Floodproofing will have to be evaluated on an individual basis to ascertain its effectiveness and practicality throughout the Irondequoit Creek Watershed.

Flood Insurance

Under the National Insurance Act of 1968 and the Flood Disaster Protection Act of 1973, the National Flood Insurance Program was initiated. It is administered by the National Insurance Administration of the U.S. Department of Housing and Urban Development. Flood insurance provides some financial protection to victims of flood-related property losses. Flood insurance does not prevent flood losses, but only compensates victims for such losses. However, in time, the land use regulations required of communities to participate in HUD's National Flood Insurance Program will effectively reduce the amount of existing floodprone development and associated damage potential and control future flood plain development. This "relocation by attrition" aspect of the flood insurance program has been strengthened by passage of the Flood Disaster Protection Act of 1973, P.L. 93-234. The Act provides that no Federal agencies or Federally-backed financial institution shall approve any financial assistance for acquisition or construction purposes in flood hazard areas unless the community in which the area is located is participating in the National Flood Insurance Program. Due to the legislative requirements of the insurance program, existing development susceptible to damage by the 100-year flood cannot be substantially improved. The Federal Insurance Administration defines a substantial improvement as any repair or improvement, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement is started or flood damage has occurred.

Raising a structure above the 100-year flood level would remove the improvement limitation, but is costly and in many cases structurally impossible. Thus, relocation out of the flood plain will quite possibly be the only viable alternative for structures that cannot be effectively utilized unless substantial improvements are made. No attempt was made to evaluate flood insurance on a benefit-to-cost relationship since there are no overall economic benefits initially and future benefits accruing to "relocation by attrition" are impossible to quantify with any degree of accuracy.

Existing town and county regulations tend to discourage construction in the flood plain. Development, however, is still increasing, but should be regulated using guidelines to reduce flood damaging effects. The most practical solution is to combine the flood insurance with development restrictions. Costs for this would be borne on an individual basis by the residents themselves. The intention of a program like this is to make inhabitants aware of available measures and possibly assist in the organization of a program.

A community qualifies for the National Flood Insurance Program in two separate phases, the Emergency and Regular Programs. Under the initial Emergency phase, limited amounts of flood insurance become available to local property owners. A community's efforts to reduce flood losses are general and in many cases guided only by preliminary flood data. The map HUD provides the community at this stage is a Flood Hazard Boundary Map that outlines the floodprone areas within the community. Subsidized rates are charged for all structures regardless of their flood risk.

Under the Regular Program, the full limits of flood insurance coverage become available locally. The premiums charged for new construction vary according to its exposure to flood damage. The community's flood plain management efforts become more comprehensive and new buildings are elevated or floodproofed below certain flood levels. These levels are derived from HUD's detailed onsite engineering survey in the community. This more detailed survey is indicated on a Flood Insurance Rate Map, which shows flood elevations and outlines risk zones used for insurance purposes.

Most of the towns and villages in the Irondequoit Creek Watershed are currently enrolled in the National Flood Insurance Program. Table 7 lists the towns and villages in the watershed and their status in the program. The table also indicates the date the flood insurance studies were completed. It is intended that all of communities will upgrade their flood plain management measures to qualify for the Regular program. The communities are required to adopt building codes to reduce flood hazards. This action will in time improve the overall conditions of the watershed. Overbank flooding would continue and adverse effects will occur to the environment; however, structural property damage will be reduced through improved flood plain management practices required by the National Flood Insurance Program.

Flood Plain Regulation

While floodproofing allows present land uses to continue by reducing their susceptibility to damage of structures and relocation alters present land use

to make total damages from floods less, regulation attempts to direct future land use in such a way that it is consistent with the flood hazard. Regulations preclude the use of the flood plain for high hazard uses, such as residential, and instead encourage the use of the flood plain for open space, agriculture, or other activities not highly susceptible to flood damage. Regulation can take many forms, including: zoning, building codes, subdivision regulation, encroachment lines, public purchase of open space properties, and purchasing the right to develop property. All of these measures have one objective in common - the prevention of future development on the flood plain which is incommensurate with the flood risk. Regulations often take the form of excluding urban development from some areas of the flood plain (the floodway), allowing only agricultural or open space uses there, and regulating urban development in other areas of the flood plain (the fringe) such that the structures will be compatible with the flood risk there. For example, building codes might require floodproofing of structures in the fringe to the 100-year probability flood level.

Evaluation of regulation is different than evaluation of floodproofing or relocation because of the requirements of the Flood Disaster Act. This act is interpreted by the Corps of Engineers (EC 1105-2-12) to mean that the with and without conditions are both characterized by the existence of flood plain regulations to the limit of the 100-year flood. This implies that costs and benefits of regulation must only be measured in the case where the Corps recommends regulations beyond the limits of the 100-year flood plain. There is no quantifiable way to evaluate economic justification of flood plain regulations, but they are potentially valuable aids for communities as they seek to minimize their flood problems. In practice, these measures are used with the flood insurance program to make a comprehensive program to deal with present and future flood damages.

Development in the flood plain must abide by enforced regulations, and the regulations must be continually reviewed and appraised with the changing needs and conditions of the area. Many localities do not rigidly enforce the regulations, particularly for large-scale development in the flood plain, since the tax base would be affected adversely without such development. Oftentimes, the local governments do not have a staff with sufficient expertise to fully implement the regulations. Many of the upstream communities in the Irondequoit Creek Watershed prefer to manage their own flood plains and thus control the land use. This action does not promote uniformity throughout the watershed and may cause adverse flood conditions in the downstream reaches. It is desirable that a central regulating committee or agency be designated or formed to promote and coordinate flood plain regulations throughout the Irondequoit Creek Watershed. Research is needed to identify quantitatively the effect of various upland uses on the downstream flood problems. Land use criteria to be developed before decisions can be made on how and which land can be used in ways that would minimize environmental and structural damage, both upstream and downstream.

In February 1975 a Flood Plain Information Report for Irondequoit Creek in Monroe and Ontario Counties was completed for the New York State Department of Environmental Conservation by the Buffalo District, Corps of Engineers.

The report provides maps and cross-section diagrams detailing standard project flood and intermediate regional flood stages and extent of inundation of the flood plain.

Recognizing the need to prevent future losses of life and property due to the continued intrusion onto floodprone areas, Congress enacted Section 206 of the Flood Control Act of 1960. The Act, with subsequent amendments, authorized the establishment of a flood plain management services program in the Corps. The objective of the program is planning for flood damage prevention at all Government levels and to encourage the wise use of flood plains for the benefit of the national welfare. Flood plain information and planning and technical assistance on flood plain hazards and flood damage reduction measures are furnished to Federal, State, and local Government agencies and private organizations and individuals upon request.

The Corps under the Flood Plain Management Services Program provides technical and flood plain management planning assistance to State and local Governments upon request. The assistance activities include:

a. Evaluation of flood hazards;

b. Floodway determinations;

c. Assistance in the preparation of rules and regulations for floodproofing;

d. Architectural and engineering assistance for floodproofing;

e. Assistance in the preparation of flood emergency preparedness plans;

f. Flood hazard evaluations to comply with the Executive Order 11988;

g. Assistance in the preparation of regulations for flood hazard areas; and

h. Other flood-related issues, such as hydrology studies and coordination, urbanization effects on stream flows and flood damages, etc.

The information and guidance are intended for wise and informed decision making at the local level. Technical services and guidance constitute a major portion of the total effort. Contacts with local governments are encouraged not only because of specific concern with floods but also as they relate to local planning problems, and the preparation of flood plain regulations. Professionals and elected officials are assisted in interpreting flood data. The limits of the flood areas and corresponding flood heights of specific design floods are defined. Where reports are not available, technical assistance can involve a comparably short, localized study to provide the essential information. Such assistance is also provided Federal agencies. Assistance to private organizations and individuals is limited to provision and interpretation of available information.

Institutional Analyses

To demonstrate the complexity of the institutional framework of the organizations involved in drainage and land use planning, a brief institutional analysis will be presented. This analysis will aid in the identification of a central body to coordinate flood plain regulations within the Irondequoit Creek Watershed. The following presents a brief description of each organization, its relationship with the other organizations or groups, its specific input into land use, and land use planning. In many cases, the groups mentioned serve many functions. The comments herein are limited to those functions related to drainage and land use considerations in the Irondequoit Creek Watershed.

1. Towns

There are portions of 10 towns contained within the watershed limits of Irondequoit Creek. In Monroe County, they are Brighton, Henrietta, Irondequoit, Mendon, Penfield, Perinton, and Pittsford. In Ontario County, they are Victor and West Bloomfield. The only town in Wayne County is the town of Macedon.

Each town is governed by an elected supervisor and town board consisting of the supervisor and four other members. Funding for town board activities is obtained through property taxes, sales tax, and Federal revenue sharing funds.

Town boards have the final authority to govern land use and land use planning within the limits of their respective towns. This includes adoption of a Master Plan, Zoning Districts, Rezoning, and Special Improvement Districts. Further, the town board sets design standards such as requirements for stormwater detention facilities. Town special improvement drainage districts are administered by the town board acting as commissioners for the Districts.

The town planning boards can be delegated the authority by the town boards to approve subdivisions of land and site plans. Town planning boards act with the input from town boards, citizen groups, consultants, and county and regional planning departments. Funding for planning board activities is through town board appropriation. Town planning boards consist of a chairman and six planning board members.

Generally, a town's Department of Public Works is charged with the responsibility of maintaining the various drainage facilities dedicated to the town. Funding for public works projects is through appropriation by the town board.

Town environmental commissions and boards serve as advisors to town boards and planning boards in connection with the environmental factors of land use.

2. Villages

The incorporated villages of East Rochester, Fairport, and Pittsford in Monroe County are also located in the Irondequoit Creek Watershed. The

structure of the villages is somewhat similar to the towns except that each village is governed by a board of trustees consisting of a mayor and four trustees. Interaction between the village board and village planning board is similar to that of the towns.

3. City of Rochester

The city of Rochester is governed by a mayor and councilpersons elected by the public. Administratively, the city Government is headed by the city manager.

a. Rochester Environmental Commission - Advisory group to the Rochester City Council dealing with the environmental aspects of land use.

b. Department of Public Works - As with towns and villages, the City Department of Public Works is charged with maintaining existing drainage facilities.

c. Department of Community Development - Administers community development funding programs for the city of Rochester.

d. Engineering Department - Administratively falls under the Department of Environmental Services. Provides "in house" engineering expertise for city projects and other city departments.

e. Planning Department - Administratively falls under the Department of Community Development. Serves to advise on planning-related matters for development within the city.

4. Monroe County

The county of Monroe is governed by a legislature consisting of 29 elected members. Administratively, county government is run by the county manager.

Department of Planning - The Monroe County Department of Planning serves not only as an advisory group to the county legislature but also advises the various towns and villages regarding proposed land use. Further, the Department of Planning is instrumental in aiding the various towns and villages in preparation of master plans, when requested.

Environmental Management Council - The purpose of the Environmental Management Council is to provide sound technical and environmental advice to the county legislature, the individual towns, town environmental commissions and boards, the general public, and the New York State Department of Environmental Conservation. The council is staffed by a senior environmentalist and an environmental engineer. Administratively, the Environmental Management Council is under the jurisdiction of the Planning Department. Funding is through appropriation of the county legislature with matching State funds.

Pure Waters Division - The Division of Pure Waters was originally formed to oversee county sewage treatment. By resolution of the county legislature,

the Division has been charged with the responsibility for overseeing drainage within the county. As a result, the Division has prepared a status report of drainage. However, additional funding for specific drainage-related projects has not been established. As a result, Pure Waters Division is not presently involved with drainage-related matters.

Health Department - The Monroe County Health Department reviews the acceptability of water supply and sanitary facilities for proposed development in Monroe County. It also acts as an agent of the State Health Department in monitoring on Irondequoit Creek. The Monroe County Health Department is an agent of the State Health Department and as such, receives partial funding from New York State.

Parks Department - The Monroe County Parks Department is charged with the responsibility for establishing and maintaining parks for the county of Monroe. Among these are Ellison Park and Powder Mills Park located on Irondequoit Creek.

Department of Public Works - The Monroe County Department of Public Works maintains drainage facilities generally along county highways.

5. Ontario County

Ontario County is governed by a board of supervisors consisting of 21 members elected by the public.

a. Planning Department - The Ontario County Planning Department advises not only the Board of Supervisors in connection with land use and development, but also the individual towns within the county.

b. Environmental Management Council - An advisory body serving the Board of Supervisors, the towns, and the general public.

c. Environmental Coordinator - The Environmental Coordinator is an administrative position created by the Board of Supervisors and the Environmental Management Council.

6. Wayne County

Wayne County is governed by a board of supervisors, one supervisor being elected to each town.

a. Wayne County Planning Board - This board serves as an advisory group not only to the County Board of Supervisors, but also to the individual towns within the county.

7. State of New York

a. New York State Department of Environmental Conservation (Region 8) - The NYSDEC covers an 11 county region consisting of Chemung, Schuyler, Yates, Seneca, Wayne, Ontario, Steuben, Livingston, Monroe, Genesee, and Orleans Counties. Divisions of air resources, pesticides, pure waters, solid waste,

community relations, fisheries, wildlife, regional attorney, environmental analysis, forestry, land acquisition, water resources planning, and law enforcement. The DEC is funded by appropriaton of the State Legislature. The DEC is the permit issuing department under Parts 15 and 24 (Stream Disturbance and Wetlands) of the Environmental Conservation Law.

b. New York State Clearinghouse - The New York State Clearinghouse serves to advise groups and agencies of the plans of others. The objective is to avoid duplication of effort or interferences between groups. Administratively, the clearinghouse is under the Division of the Budget.

c. New York State Department of Transportation - NYSDOT is funded through appropriation of State Legislature. The DOT has the responsibility for planning, construction, and maintenance of the State highway system. Further, it is responsible for certain State waterways.

d. New York State Department of Parks and Recreation - This department is funded through appropriation by the State Legislature and is responsible for the creation and maintenance of the State park system.

e. New York State Health Department - Generally, this department is responsible for approving, regulating, and monitoring public water supply, distribution, and storage facilities throughout the State.

f. State of New York Department of Agriculture and Markets Soil and Water Conservation Districts - This agency, with technical assistance from the United States Department of Agriculture - Soil Conservation Service, works at the local county level to assist individual landowners and users and units of Government with planning and installing conservation practices, with onsite planning of soil and water-related problems and with soil interpretations for land use.

g. New York State Soil and Water Conservation Committee - This committee is a State agency which sets policy and provides direction and guidance to Soil and Water Conservation Districts (SWCDs) and is designated by NYSDEC (the water quality management agency of NYS) as the agency to administer the agricultural nonpoint source implementation program at the State level.

8. Federal Government

a. Soil Conservation Service - Department of Agriculture - The U.S. Soil Conservation Service assists individual landowners and users and units of Government with planning and installing conservation practices, with onsite planning of soil and water-related problems, and with soil interpretations for land use.

b. U.S. Geological Survey - The USGS is responsible for data gathering and recording aspects of stream flow data.

c. U.S. Army Corps of Engineers (Buffalo District) - Responsible for flood control, navigation, and beach erosion control projects in an area that covers northern Ohio, a portion of northwestern Pennsylvania, and western,

central, and northern New York. As part of its many responsibilities, the Corps maintains Rochester Harbor (Charlotte), operates Mount Morris Dam, and is currently engaged in a major study of the Finger Lakes - Oswego River Basin and a recreational navigation project for Irondequoit Bay.

d. Heritage Conservation and Recreation Service - Responsible for allocating grants for local recreation projects. The grants given to State of New York are administered by State Parks and Recreation Department.

e. U.S. Environmental Protection Agency - Administers and enforces Federal pollution control programs on a national and international basis.

f. Federal Insurance Administration and Office of Flood Insurance (HUD) - The Federal Insurance Administration is responsible for administering National Insurance Flood Program. This includes establishing and mapping the limits of the floodprone areas within the limits of the towns and villages.

9. Other Organizations

a. Genesee/Finger Lakes Regional Planning Council - This group is an advisory group for the eight-county area consisting of Genesee County, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, and Yates Counties in connection with land use and development. Funding is established through the various county members.

b. Delta Laboratories - Delta Laboratories is a nonprofit organization funded by private contributions serving as an advisory group to local units of government and other interested groups in connection with water and air pollution.

c. Rochester Committee for Scientific Information - This is a nonprofit organization consisting of approximately 300 members. Funding is through dues of the membership. This group conducts research on environmental issues.

d. Center for Environmental Information - Serves as a coordinator for environmental information and education in the Rochester region.

e. Center for Governmental Research - A private nonprofit organization engaged in governmental and community research only. Does studies that involve public interest.

f. Sierra Club - Over 160,000 members nationally; founded in 1892 to explore, enjoy, and protect wild land and wild life; to preserve and restore quality of environment.

g. Genesee West Audubon Society - Local chapter for the National Audubon Society.

h. Policy Advisory Committee - Serves strictly as an advisory body for recommending activities worthy of being undertaken by Region 8 of NYSDEC. The committee has representation from the 11-county area comprising Region 8.

In order to provide effective basin-wide flood plain regulations, it would be necessary for the municipalities to cooperate with one another and to commit themselves to a central working body for directing the use of and implementing the results of coordinated land use policy. This could possibly take the form of a watershed steering committee composed of the interest groups themselves, or some type of a nonaffiliated advisory group. The committee could be similar to the Irondequoit Creek Drainage Committee, which was abandoned due to the Monroe County Planning Department staff and budget cuts several years ago. The most effective choice for a central body would be an agency under Monroe County jurisdiction. Sketches 7 and 8 demonstrate the flow chart of operation and the inter-governmental relationships necessary for effective flood plain management in the Irondequoit Creek Watershed. Some of the towns in the past have expressed opposition to intervention of Federal, State, or county agencies into their management of flood regulation. Therefore, a steering committee composed or representatives from all towns in the watershed could be another possible solution.

SELECTED PLAN FOR REMAINDER OF WATERSHED

The selected plan for the remainder of the Irondequoit Creek Watershed is a nonstructural plan for Non-Federal implementation. To best meet the flood plain management needs of the watershed, the plan would be a combination of several nonstructural measures for flood prevention that were described in the alternatives section. The selected alternative would combine flood insurance, flood plain regulation, and floodproofing under an institutional framework.

Based on the institutional analyses in the preceding section, an agency under Monroe County jurisdiction would appear to be the most feasible entity to act as a central body. Approximately 90 percent of the watershed is contained within Monroe County. This central body would be representative of all towns within the Irondequoit Creek Watershed.

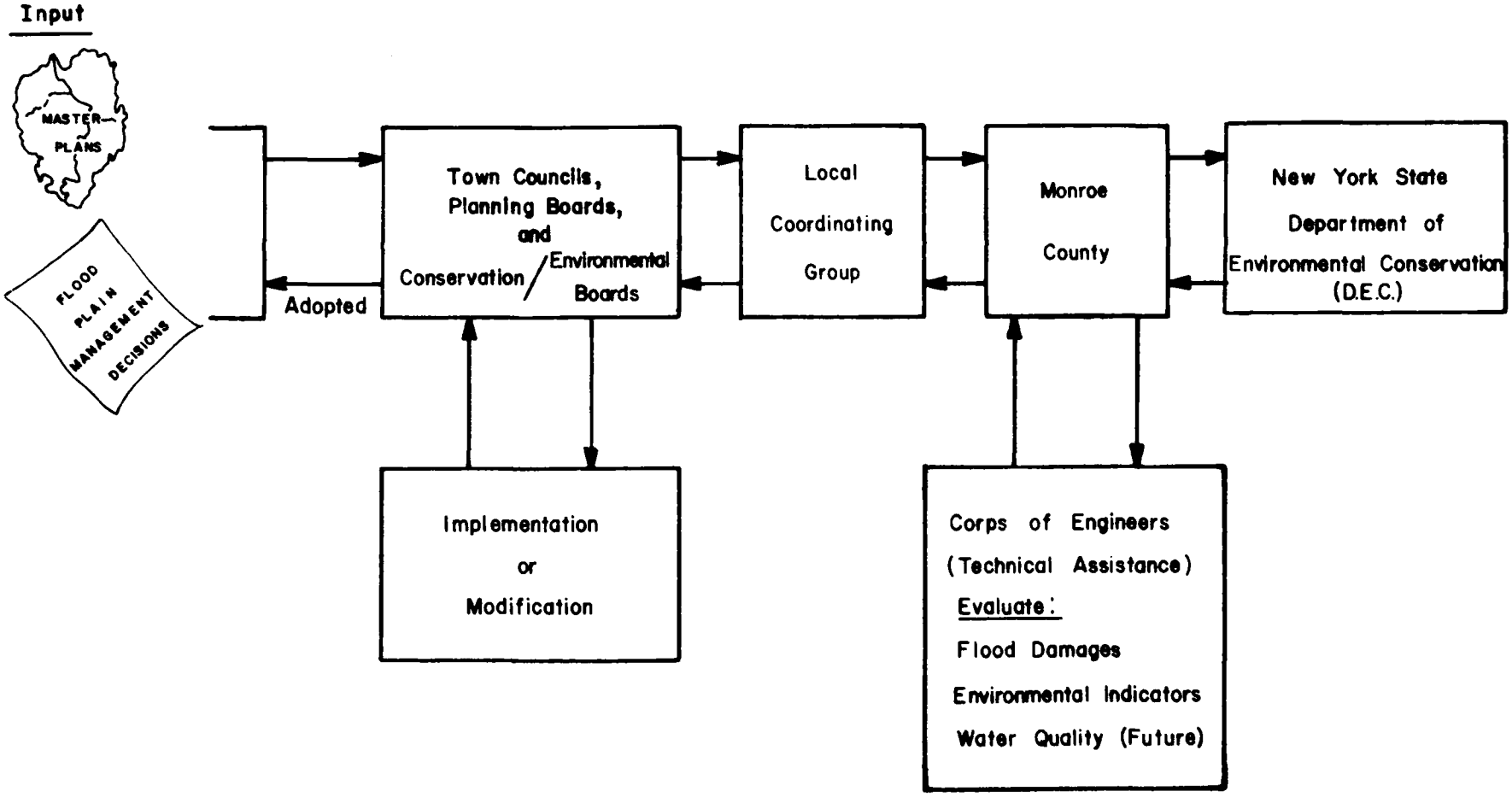
The information shown on Sketches 7 and 8 demonstrates the inter-governmental and inter-agency relationships necessary for effective flood plain management in the Irondequoit Creek basin.

Currently, the Pure Waters Agency, under the Monroe Department of Public Works, has jurisdiction to coordinate a drainage district for the watershed. However, many of the towns within the watershed are opposed to intervention into the management of their flood plains. The Pure Water Agency is the local sponsor implementing New York State's 208 Program (Federal Water Pollution Control Act Amendments of 1972 - Public Law 92-500, Section 208).

More accurately, Monroe County is part of the "nondesignated" portion of the State for 208 Water Quality Planning and as such, ultimate responsibility for 208 planning rests with the State of New York Department of Environmental Conservation (DEC). However, DEC, in its State 208 Plan, supports active county participation in refining and implementing the State 208 Plan. As a result, Monroe County has recommended the Monroe County Administration be the principal agent for carrying out the 208 Program locally. In addition, within Monroe County, the County Manager has appointed an advisory committee,

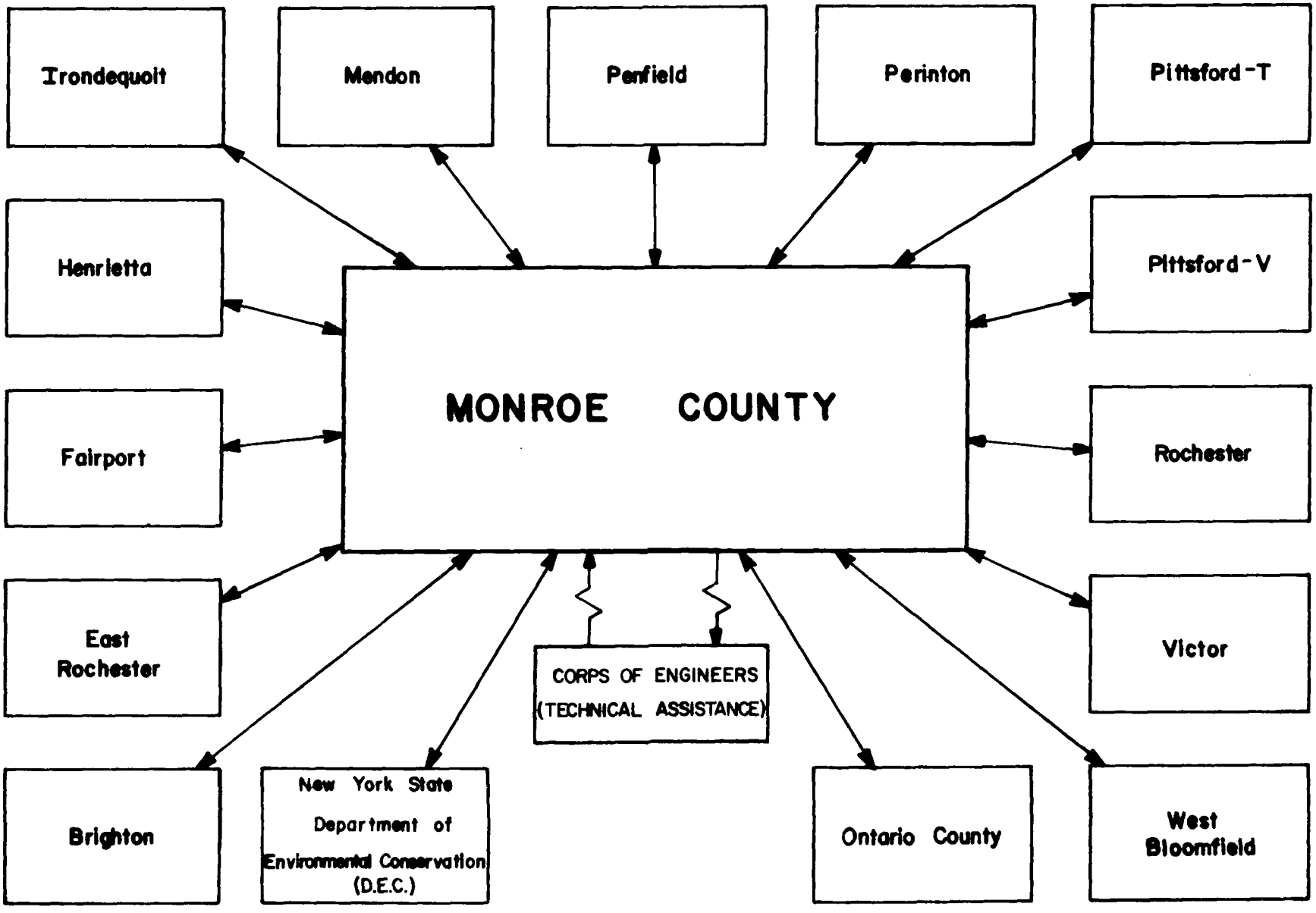
FLOOD PLAIN MANAGEMENT

Organizational Flow Chart For Continuing Operation



SKETCH 7

INTERGOVERNMENTAL RELATIONSHIPS FOR CONTINUED OPERATION



SKETCH 8

known as the Monroe County 208 Water Quality Management Planning Committee, to coordinate State 208 activities as they affect Monroe County. This committee is made up of members of several County agencies including the Division of Pure Waters, the Environmental Management Council, and the Departments of Health and Planning, as well as local officials and business and industrial representatives.

Although the program primarily concerns improvements to water quality, it also involves land use management. Land use management could include drainage management. It would have to be determined if Pure Waters has the jurisdiction to regulate and enforce flood plain management techniques, and if they would have the support of the towns.

Another possible solution for an institutional framework would be to establish a central watershed committee that would be comprised of representatives from all the towns in the watershed. To date, this plan has not been acceptable to all townships because the upstream communities could lose some jurisdiction over their own development plans, while the downstream communities would gain control over upstream activities. The committee would need to be based on communicating common interests and long range planning goals to solve this problem. In order for the committee to work effectively, all towns must participate and would be required to meet on a regular schedule.

This nonstructural alternative combines flood insurance, flood plain regulation, and floodproofing under jurisdiction of a central institutional body, as described above. Most of the towns and villages in the Irondequoit Creek Watershed are currently enrolled in the National Flood Insurance Program, as shown in Table 7. The central body could aid towns in qualifying for the regular flood insurance program and aid in the distribution of flood insurance information to the public within the flood plain areas.

Basin-wide flood plain regulations could be drafted by the committee to standardize the separate regulations currently adopted by each town. Public education and tailoring of regulations to meet community desires and needs should be a major consideration of the central body. Typically, several public hearings are conducted for proposed regulations to permit full expression of views and negotiation on key issues. The regulations are carefully explained, including their purposes and operation. In this way, landowners and the general public are educated as to proposed regulatory standards and the administrative procedures for operation of the regulations. Pamphlets, brochures, newspaper articles, and workshops may also be used for education purposes.

Community preferences are relevant to establishment of floodway boundaries, flood protection elevations, the allocation of particular flood fringe areas to particular uses (e.g., commercial, open space), the extension of public services to flood plain areas, and the use of nonregulatory (e.g., land acquisition) as well as regulatory techniques.

Landowner attitudes are also important since considerable negotiation often occurs with affected landowners to accommodate their demands to the extent possible (e.g., permitting certain uses in the outer flood fringe) while accomplishing public objectives.

Flood plain regulations should be integrated with broader controls to take into account public service costs, compatibility of adjacent uses, and broader social, economic, and environmental factors. Close cooperation between State, local, and Federal regulatory agencies with regulatory permit authority is also needed and could lead to the use of combined permit procedures to facilitate permit processing and reduce the burden and inconvenience to developers. Flood plain regulations alone cannot prevent all flood losses, but they could reduce the potential for these losses while promoting multiple use of land and preserving a wide range of options in the private use of land.

The floodproofing portion of the plan could result in an educational program organized by the central body to inform property owners in the flood plain of floodproofing techniques. Also, information could be provided for available aid, either technical or financial. Both permanent and temporary floodproofing methods would need to be evaluated for each reach of the watershed to determine their feasibility.

After the selection of a central body is made and actually implemented, several idealized steps are suggested that may improve the effectiveness of flood plain management in the Irondequoit Creek Watershed:

1. Inventory of flood hazard lands. This inventory should provide: (a) an evaluation of the flooding threat, including the geographical extent of inundation of the planning flood or floods, flood heights, and areas of special wave action or erosion damage; (b) an evaluation of other special problems or hazards, such as geologic conditions which may cause structural bearing problems for buildings and soil limitations which may limit the use of onsite soil absorption fields for septic tanks; (c) an inventory of special environmental values such as areas of special scenic beauty, fish spawning grounds, waterfalls, caves, duck nesting areas, areas with special recreational importance, and areas suitable for water-related development; (d) an inventory of special cultural and archaeological features such as Indian mounds and historic sites; and (e) a definition of existing uses, including their intensity and condition and the degree of flood protection afforded by levees, structural floodproofing, and so forth. These data, when combined with natural resource and cultural data for the community as a whole, will suggest the relative suitability and capability of the flood plain for particular types of development.

2. Definition of community needs for use of flood plain lands (recreation, industrial, commercial, residential, etc.). In an ideal sense, overall growth projections and land use needs should be defined as part of a comprehensive planning process. Nevertheless, attention can, in many instances, focus upon demand for open space, recreation areas, wildlife areas, agriculture, and other uses with particular applicability to the flood plain.

3. Selection of flood plain management policies for particular flood plain areas in light of hazards, special environmental values, land use demands, existing uses, cost of public services, and other factors.

4. Selection of the combination of regulatory and nonregulatory management techniques most appropriate to achieve the desired policies for particular areas. The advantages and disadvantages of regulatory and nonregulatory techniques discussed earlier should be taken into account.

5. Program implementation through adoption, administration, and enforcement of regulations, open space acquisition, flood insurance, and flood-proofing techniques.

6. Periodic revision of plans, policies, and management techniques as social and economic conditions change. Flood conditions change due to urbanization and other factors, and the needs and desires of community residents change.

The complete process may not be practical for all areas but is desirable for urban and urbanizing areas where careful analysis is needed of flood plain values and limitations including, but not limited to, flooding threats. Such a process would also help integrate flood plain management with broader land use planning and management.

ALTERNATIVES CONSIDERED FURTHER

GENERAL

Several viable alternatives have been investigated and appear to warrant further study to adequately respond to the needs of the public and other Federal and non-Federal interests. This section presents more detailed information on the design and functions of Alternatives A, B, and C for the Panorama Plaza area of the Irondequoit Creek Watershed. General data with regard to design criteria and assumed adverse or beneficial qualities are discussed in this section. More detailed design data is available in the Hydraulic and Hydrologic Appendix C, Design Appendix D, and Geotechnical Appendix E.

DESCRIPTIONS OF ALTERNATIVES FOR THE PANORAMA PLAZA AREA

Alternative A - No Action

This alternative provides a plan of no action where no new structural or nonstructural measures are proposed to relieve flood damage impacts. The present base conditions of the town of Penfield will continue. This is not a viable solution for the flood problems along Irondequoit Creek, since flood damages will still occur. Highway traffic and public services, such as telephone, power, gas, garbage collection, fire, ambulance, police, doctor businesses and many other day-to-day operations could be impaired during a flood. During flooding, bank erosion would continue which could eventually affect buildings that encroach upon the creek's flood plain. The aftermath of a flood would leave silt and debris that would be aesthetically unattractive.

Further development and encroachment into the flood plain will reduce the natural storage capacity of the basin and thereby increase the damages

assessed due to flooding. The town would continue with the flood insurance program, flood plain management, and zoning. However, at present they are general and are not specific enough to provide strict enforcement to reduce encroachment in the flood plain.

Alternative A is not recommended for this study area. The no action plan will be continued into the System of Accounts only as a base condition by which the other considered alternatives may be compared.

Alternative B - Levee/Floodwall

Alternative B is a structural alternative that provides flood damage reduction with the utilization of levees and floodwalls. This alternative was investigated at a 50-, 100-, 500-year, and SPF levels of protection. A 100-year level of protection is used in the following description and detailed on plate 2.

In the reach between the Route 441 Bridge and the Panorama Trail Bridge, a levee will be constructed along the right bank (looking downstream). The levee will be constructed from a high ground point behind the bowling alley, over and behind the creek bank treeline to the Panorama Trail Bridge embankment. The levee will be constructed with a 10-foot crest and 1:2.5 sideslopes. The left bank of Irondequoit Creek in this reach would not require any flood control structure. This is due to the natural high topography along the left bank.

In the reach between the Panorama Trail Bridge and Penfield Road, a levee will be constructed along the right bank. The levee will begin at the road embankment near the Panorama Trail Bridge and continue along the parking Lot of the printing firm. The printing firm will be acquired because it would not be incrementally justified to construct a floodwall to protect one building that is endangered due to its close proximity to the erosive bank.

The levee would continue along the back property line of the businesses along Panorama Trail. The alignment would then follow along the outside perimeter of the undeveloped area, allowing the open space to serve as both a flood plain and a recreational park. The levee would connect to the high embankment at the Penfield Road Bridge. Along the left bank in the same reach, a floodwall would be placed behind the immediate treeline from a point just downstream of the Panorama Trail Bridge to the confluence of Allen Creek. Two 6-foot wide floodgates would be installed in the wall at the plaza extension bridge for pedestrian access.

Allen Creek would be channelized 30 feet wide with 1:2.5 sideslopes for 900 feet upstream along a new, meandering alignment. A 3-foot drop structure would be constructed at point 850 feet upstream of the confluence. Riprap would be required downstream of the drop structure on Allen Creek. A low flow channel and pools would be incorporated into the design to improve the fish habitat. Grass, shrubs, and trees will be planted to stabilize the banks of the newly channelized reach and to provide shade cover. A levee will be constructed along the right bank (looking downstream) of Allen Creek.

In the reach between the Penfield Road and Old Penfield Road Bridges, a levee would be constructed along the right bank behind the treeline. The levee would continue across Old Penfield Road and be placed along the alignment of the private road to the Genesee Conservation League. The private road would be reconstructed along the 23-foot wide crest of the levee retaining the two-way traffic capability that presently exists. The levee alignment would turn off the road and run adjacent to the Brookhill Apartments where it would connect to existing high ground. Due to the high velocities in this reach of Irondequoit Creek, erosion protection would be required for the right and then left bank downstream of the Old Penfield Road Bridge.

The Old Penfield Road Bridge and the Plaza Extension Road Bridge are obstructions to only low flows. During high flows, the bridges act as natural drop structures which aid in reducing erosive velocities in Irondequoit Creek. The bridges are recommended to remain in place, though vehicular access will be eliminated at the Plaza Extension Bridge. Pedestrian access will be maintained at the Plaza Extension Bridge to allow employees from the Sybron-Nalge area to walk to Panorama Plaza. There would be temporary disruption of vehicular traffic over the Penfield Road Bridge during periods of high creek stages.

The Panorama Plaza area was divided into four interior drainage subareas. Each area will be collected by a drop inlet and drained by a culvert pipe or box culvert through the levee to the creek. To prevent backflow through the culvert during high creek stages, a flapgate and a sluice gate would be included as part of the total internal flood control system. Refer to Plate 6, Internal Flood Control, for further details.

The design description is generally the same for the 50-, 100-, and 500-year levels of protection. The 50-year design have levees and floodwalls approximately 0.5 foot lower than that of the 100-year design and the 500-year design is approximately 1.0 foot higher than the 100-year design.

The design of Alternative B at the Standard Project Flood (SPF) level is similar but much more extensive. The large volume of runoff during a Standard Project Flood will create higher stages. The design heights of the levees and floodwalls will be approximately 8.0 feet higher than the 100-year level of protection. In addition to raising the design height, the length of the levees and floodwalls will be extended along the east bank and west bank of the reach between the Route 441 Bridge and the Panorama Trail Bridge. Plate 3 details the general design of Alternative B at the SPF level of protection.

The large SPF flows in Irondequoit and Allen Creek generate extremely erosive velocities. These velocities are excessive for the silty-sand soil conditions in Irondequoit and Allen Creeks. The entire length of Irondequoit Creek will have to be riprapped for erosion protection as indicated on plate 3. The sheet pile wall will provide erosion protection at the floodwalls. Erosion protection will also be required along Allen Creek for 900 feet.

The internal flood control measures will be similar for the SPF level of protection as for the lower levels of protection. The length of the culvert and the depth of the gate well for the sluice gate would increase for the SPF plan.

As detailed in the Cost and Economic Appendix, the additional costs for levees and floodwalls, erosion protection, and interior flood control would cause the SPF level of protection cost to be economically unjustified. The SPF level of protection would also be environmentally unacceptable due to extensive destruction of the bank vegetation and fish habitat due to placement of riprap erosion protection along both Irondequoit and Allen Creeks. Therefore, the Standard Project Flood level of protection for Alternative B will not be considered further in this report.

In a previous section, "Recreational Development," a description was presented of the recreational facilities that are proposed for the open area behind Panorama Plaza. The development of a town park would be beneficial to both the public and the plaza store owners. The increased number of people utilizing the recreational facilities would likely result in an increase in sales for the stores in Panorama Plaza.

Planning of the alignments for the flood control structures have been coordinated with the Penfield Parks and Recreation Department to avoid disruption of their preliminary plans for the town park. In this alternative, the levees and floodwalls are set back from the creek to preserve the riparian treeline. The levee would border along the outside edge of the open area, but there would still be sufficient land for the proposed multi-purpose fields, baseball diamond, playground/picnic area, and restrooms.

Alternative G - Nonstructural

According to the Federal Register, 29 September 1980 in Section 711.53, "A primarily nonstructural plan is to be formulated and included as a candidate plan wherever a structural project or program alternatives are considered." This nonstructural plan was developed to conform with Principles and Standards and for comparison to the structural alternatives proposed to the Panorama Plaza area. Five nonstructural measures were investigated - flood warning, floodproofing, permanent evacuation, flood insurance, and flood plain regulation. Each of these measures were investigated individually and in combination to determine if they could meet the planning objectives of this report.

Three of the five nonstructural alternatives were not feasible either individually or in combination for the reasons stated below. The three measures not considered further:

Flood Warning - An integral part of a flood warning system is the installation of a flood warning device or method, and developing an emergency plan of action. Currently, there is no formal flood warning system in the watershed. Flood warning measures provide information about possible flooding so that those who may be affected by such flooding can escape with some belongings or can employ emergency measures, such as sandbags or flood screens, to protect

themselves. Flood warning best serves floodprone areas in the lower reaches of the watershed. However, there is insufficient lag time for flows in Irondequoit Creek to warn downstream residents if detection of a potential flood is made upstream. The shortness of the warning duration, absence of coordinating agencies, and the impractibility of providing rapid floodproofing measures in the plaza area would make flood warning an impractical measure except for implementing emergency evacuation.

Floodproofing - Floodproofing measures, both temporary and permanent, provide onsite protection of individual properties against flood related damages. Temporary measures include closure devices and barricades. Permanent measures include watertight substructures, building anchors, pedestal foundations, and individual dikes, levees, and floodwalls. Many of the stores in Panorama Plaza have two entrance glass doorways, large glass windows, and loading docks. The apartment complexes have many basement apartments with windows at ground level. The nature and design of the structures in the Panorama Plaza flood plain make many of the floodproofing measures impractical. The sealing of all openings would be unrealistic while the planning, coordination, and time constraints of placing temporary shields and sandbags would also be impractical.

Permanent Evacuation - Permanent evacuation involves the removal of all existing flood damageable structures from flood potential lands and thereby eliminates to some degree the need for flood damage reduction structures and management. This is the only nonstructural alternative that most effectively reduces flood damage by removing the damageable property. The flood plain would be converted back into a natural habitat which provides environmental benefits to the area. This measure has an extremely high cost of over $35 million for total permanent evacuation. In addition, this measure has extreme adverse impacts upon the social well-being and regional development of the area.

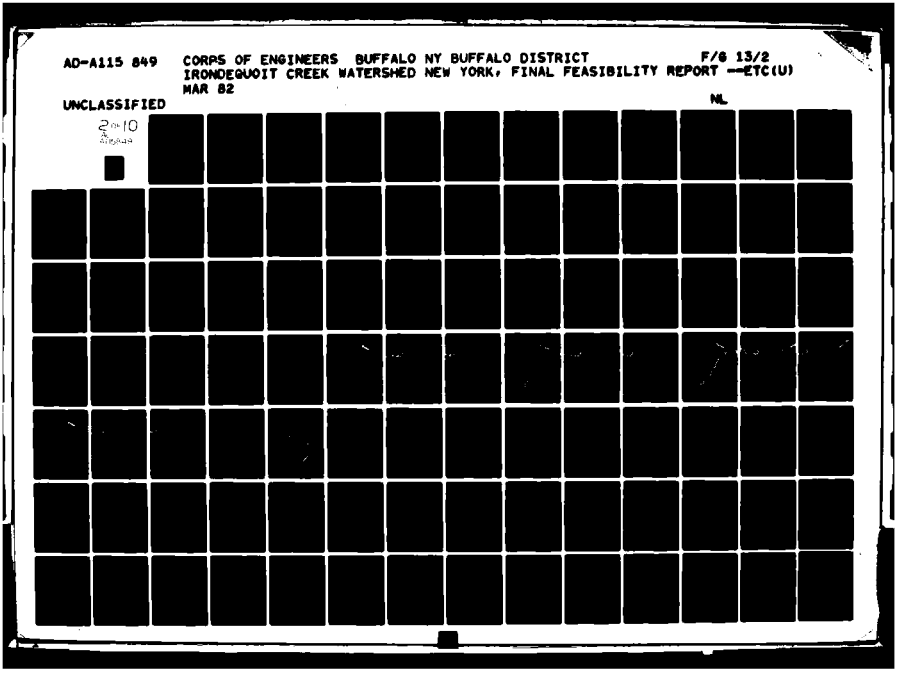
Two aspects of the nonstructural alternatives were considered feasible. The two measures are flood insurance and flood plain regulations. Both measures are currently being implemented in the town of Penfield and are included in the base no action plan. However, implementation of these measures can be improved upon and expanded. Recommendations for these improvements are presented below:

Flood Insurance - Flood insurance is available to watershed residents through private programs and through the Federally subsidized National Flood Insurance Program.

Most communities having jurisdiction over the floodlands of the watershed receive Federal assistance of some kind, and under the Flood Disaster Protection Act of 1973, these communities must participate in the National Flood Insurance Program in order to continue to receive Federal funds. Therefore, it is likely that most of these communities will participate in the national program, which promotes land use regulations to prevent further development in floodprone areas. The Flood Insurance Program gives support to local communities in terms of providing technical data and establishing standards. However, flood insurance would provide no direct protection for

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL



life, health, or property; its sole benefit would be to financially compensate flood victims for their losses. Flood insurance does not prevent flood losses but merely compensates the victims.

A detailed description of the National Flood Insurance Program is presented in this report under the section, "Remainder of Irondequoit Creek Watershed - Nonstructural, Flood Insurance." The National Flood Insurance Program consists of two separate phases, the Emergency and Regular programs. The town of Penfield is currently enrolled in the emergency program. This program is more general in its guidelines and benefits to the community and property owners. The town should work toward enrollment in the regular program. The community's flood plain management efforts become more comprehensive in the regular program. A more detailed survey is completed for the Flood Insurance Rate Map, which shows flood elevations and outlines risk zones.

The initial step that a community takes to participate in the program is to apply for admission to the emergency program. To become eligible, a community must have a functioning building/zoning permit system or adopt one by ordinance. It must also pass two resolutions, one essentially voicing interest in joining the program, the other concerning building permit reviews. These reviews are to determine whether proposed building sites will be reasonably safe from flooding. If the proposed building is located in a flood hazard area, it must be designed and anchored to prevent flotation, collapse, or lateral movement, and must use construction materials and methods that will resist flood damage. In addition, all subdivision proposals must be reviewed to see that they are consistent with the need to minimize flood damage, that utilities are so located and constructed as to accomplish that same end, and that proper drainage is provided. Also, new or replacement water and sewer systems must be appropriately designed for flooding situations. This is all spelled out in Section 1910.3(a) of the Federal Insurance Administration (FIA) regulations.

When FIA produces a special flood hazard boundary map (SFHB), the community should then advance to section 1910.3(b) of the regulations. At this time, local officials must begin addressing the issue of the meaning of minimizing the damage in new or rehabilitated consruction. Since the SFHB map is not specific as to elevation, this section does not go much further than the requirements for admission to the program.

The next phase of the program entails the production, at FIA expense, of a Flood Insurance Rate Study by a study Contractor. This Contractor may be a Federal agency such as the U. S. Army Corps of Engineers, the Soil Conservation Service, or the U. S. Geological Survey, or it may be a private consulting engineering firm. These studies, using standard hydrologic and hydraulic techniques, provide flood profiles and delineations, as well as a proposed floodway. Two types of maps are produced; one is used for insurance rating purposes, the other as a flood plain management tool. Six months after the elevations resulting from this study are published in the Federal Register, they become the official levels both for insurance purposes and for flood plain management.

At this point, the community is asking to adopt flood plain management ordinances that will comply with Section 1910.3(d) of the regulations. When this is done, the community is admitted to the regular flood insurance program.

The requirements for flood plain management under Section 1910.3(b) include several items. The major ones are as follows:

a. New construction or substantial improvements of residential structures within the area of special flood hazards must have the lowest floor (including basement) elevated to or above the level of the 100-year flood.

b. New construction or substantial improvements of nonresidential structures within the area of special flood hazards must have the lowest floor (including the basement) elevated to or above the level of the 100-year flood or, together with attendant utility and sanitary facilities, must be floodproofed up to the level of the 100-year flood.

c. A floodway for passage of the water of the 100-year flood must be designated. The selection of the floodway shall be based on the principle that the area chosen for the floodway must be designed to carry the waters of the 100-year flood, without increasing the water surface elevation of that flood more than 1 foot at any point.

These three items, which form the basis of the flood plain management muscle of the National Flood Insurance Program, cause the most administrative problems for enrolled communities. Often communities have raw data provided by FIA, but lack the interpretive knowledge to use it.

A community's real experience with the Flood Insurance Program occurs not at the 1910.3(a) stage when local officials must exercise general caution in what is built-in known floodprone areas, not at the "(b)" stage after the general perimeter of the hazard area has been defined, and local officials must begin addressing the issue of the meaning of minimizing damage in new or rehabilitated construction, but when the community has been presented with its detailed FIA study, clearly delineating the floodway, floodway fringe, and the elevation of the 100-year flood. At this point, the community faces the adoption of the more stringent flood plain land use development controls required by the program, e.g., 1910.3(c) or (d).

Many of these communities have a constituency occupying residential or nonresidential structures in the flood plain, and these people are feeling a degree of security in being eligible for flood insurance coverage. The negative impact of the program begins to dawn when the FIA presents the draft of the detailed delineation of the floodway, floodway fringe, and 100-year flood elevations; areas subject to development constraints are fixed with engineering precision.

There remains a real need to counsel communities on the meaning of the scientific study and the methodology used to reach the conclusions. Some moderately elementary method to bridge the gap between the competent scientific researcher and the equally competent, politically-oriented local official, must be found. The community's need to know and understand the study, its

rationale and assumptions, cannot be treated lightly because the community is faced with fixed boundaries for its floodway and floodway fringe. These boundaries will dictate development constraints in the community. They are not based on flexible economic or social criteria as may be the case with the community's land use plan and zoning ordinance. These flood data were probably entirely technically derived and permitted no political input.

However, it is quite conceivable that the FIA-produced flood study may be erroneous. The community should and does have the opportunity to challenge it. At the moment, the Federal Flood Insurance Program is the nonstructural approach applicable for most communities, and a mixed blessing in the eyes of many. The insurance program's community eligibility requirements seem to impose severe limits to community development, the program is favorable to most communities and, at present, provides flexibility which will permit reasonable use of flood plain land.

One response by those with the foresight to see the development restrictions coming may be to build in the flood plain while the community is in the "emergency" program, with its subsidized insurance rates and the very loose restrictions of 1910.3(a) and (b). The emergency program, meant to accommodate existing uses, may have an effect of violating the intent of the total Flood Insurance Program. In fact, it may be stimulating development in the flood plain. This should be a question of not inconsequential interest to the Federal sponsor of the program.

It is recommended that the town of Penfield planning board restrict development and expansion in accordance with flood plain management ordinances relative to the regular program, though the town has only emergency program status presently.

Flood Plain Regulations - Utilizing flood plain regulations is a tool to providing flood plain management to a community. It is necessary to implement precise and enforceable regulations to have an effective Flood Insurance Program. Since the regulations supplement the Flood Insurance Program, the following description will relate both aspects to the nonstructural solution.

Flood plain regulations are congruently provided in several different forms. They are in the form of statutes, zoning ordinances, and building codes.

Statutes - A statute is a legislated act that declares, commands, or prohibits something. It is the written will of the legislature, solemnly expressed according to the formulas necessary to constitute the law of the State. Those States that have enacted statutes dealing with channel encroachments, refer to the prohibiting of structures that will "unduly restrict the capacity of the floodway," "diminish the cross section of the stream," or "affect the life and property below the works."

Anyone who builds in a potential flood area should expect to contend with the natural or regulated flood flow but not expect to suffer losses through increased flows and flood heights caused by the acts or omissions of others. Such flood damage to others may result from the following main conditions: (1) encroachments into the channel that increase flood stages; (2) lack of

channel and levee maintenance which causes increased flood stages or levee failure under flows less than their design capacity; (3) inadequate design and maintenance of dams and levees to reasonably insure their safety in time of floods.

Statutes dealing with floodwaters are apparently aimed at preventing the above conditions and are different from zoning ordinances, which attempt to reduce flood losses by a planning approach.

Zoning Ordinances - Zoning is a legal tool used by cities and counties to control and direct the use and the development of land and property within their jurisdiction. This is done by dividing the area into districts and specifying the uses that can be made of the land (and the height and bulk of structures permitted) in each district. Zoning is concerned with the use and conditions of use, not ownership, of parcels of land. Division of a community into various zones and specifications of what use is to be made of the land in the various zones should be, and generally is, the result of a comprehensive planning program for an entire community, for the purpose of guiding its growth. The terms "planning" and "zoning" are often, mistakenly, used interchangeably. Planning is the broader term and connotes projected visions of the systematic development of an area with particular reference to traffic patterns, parks, municipal building, and various other community needs. A planning program has no legal status. Zoning, as described above, is a legal tool that is used to implement and enforce the details of a planning program.

Observation and experience of the conditions that arise in unplanned communities have prompted modern and progressive municipalities to establish some sort of planning program, from which enactment of comprehensive zoning ordinances follows. The proper ends of zoning are to conserve the value of the property and to make the most appropriate and beneficial use of available land. Flood plain zoning is a means of regulation of land subject to flood by placing it in a separate district with certain restrictive use provisions so that flood damage can be minimized. Secondary benefits obviously accrue through the consequent protection of the health and general welfare of the community, but the main purpose is to reduce flood damage.

The provisions of the ordinances themselves vary extremely, ranging from a simple, one-line statement that no structure may be built in the area to statements three and four pages long which give various use permits, conditional uses, and similar details. The vast majority of ordinances consider all the flood area to be one zone, and the uses permitted are uniform throughout. A few ordinances that were given more study in their preparation differentiated between the floodway and the floodway fringe area. A floodway consists of the channel and that portion of the overbank area which is required to efficiently carry floodwaters, and no filling or permanent structures are allowed in this area. In the floodway fringe area, and in those ordinances with a single flood-zoning classification, the most often permitted uses are accessory uses to business, agriculture, storage yards, parks, recreational, and amusement facilities, and open-type uses. Most flood plain zoning provisions in the various ordinances take a positive approach by enumerating allowable uses that could be made of the land or by

providing for its full use if it is protected. This type of provision is more difficult and time consuming to prepare, but is ultimately more satisfactory than negative approaches which simply state that certain or all uses are prohibited. One danger of zoning ordinances is that they do not prohibit filling of the flood plain and do not have the benefit of being supplemented by channel-encroachment laws; filling may take place, thus constricting the channel and aggravating flood conditions.

Zoning laws and court interpretations of their legality are moving further and further away from the earlier held belief that it was a man's right to use his property as he wished, regardless of how such use affected his neighbors and the community.

Because a zoning ordinance usually is not retroactive, previously established objectionable developments cannot be removed immediately, but under a "nonconforming uses" clause, buildings not in accord with new zoning provisions can be removed progressively. Nonconforming use is land use existing at the time an ordinance is enacted which is not in accord with its provisions. Early efforts to force compliance with zoning ordinances were very unpopular. As a result, most ordinances now provide that any lawful building, structure, or use pre-existing the ordinance may be continued indefinitely or for a specific period of time even though it does not conform to the terms of the ordinance.

One such example of the clause's application would be as follows:

A nonconforming building that is severely damaged may not be rebuilt and has to be torn down and made to conform within X number years of the date of the ordinance.

Building Codes - The purpose of a building code is to establish minimum requirements to safeguard life, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, and location and maintenance of all buildings and structures within an urban area. In short, a building code is a set of rules to protect people from physical or financial injury resulting from negligent acts of property owners. Building codes are not meant to be recommended standards of construction or to contain provisions meant to safeguard a person's investment in a structure. They are <u>minimum</u> requirements concerning the safety of a structure for the preservation of life and health. Authority to establish building codes, like zoning ordinances, is a prerogative of the State, enforceable under its traditional "police powers," as delegated to various local governments by suitable enabling legislation. To meet the test of legality, building codes must: (1) relate directly to the purpose of the code--i.e., provide minimum standards for preservation of life and health and the safety of the structure; (2) to be reasonable in their requirements; (3) provide necessary building standards to indicate to the builder the desired requirements, which the building inspector may check in design before issuing the permit.

Preparation of a building code is a time-consuming and costly operation, and a code has to be revised periodically or it will soon become obsolete. To

improve the standards and reduce the costs of building codes to communities, model or standard codes are available which can be adopted by local communities with but minor changes necessary to meet local needs.

Published articles on regulation of flood plain development have indicated that building codes are a useful tool to reduce flood loss. The more specific articles have indicated that construction standards set forth in building codes may: (1) specify minimum elevation for footings or the first floor of a structure; (2) requirement reinforcement to withstand water pressure and high velocity flow; (3) prohibit basements; (4) require that buildings be firmly anchored to prevent their floating off their foundations.

Flood plain regulations in the form of zoning ordinances and regulations in the town of Penfield are designed to discourage or prohibit construction in the flood plain. Although new development is currently prohibited in the Panorama Plaza area by the town, modification to existing structures are unregulated. During these modifications, the value of the structure and contents could increase enough to significantly increase flood damages if a flood were to occur. It is recommended that the town, county, and State reduce the amount of new development and encroachment in the flood plain by enforcing the present flood plain regulations. There has been a lack of positive aggressive action by the State to enforce adequate channel-restriction provisions. It is revealing that, while a few States have provisions in their laws for purchase and removal of existing channel encroachments, this has virtually never been done, even when the channel encroachments were serious. The tendency to take a passive role is not a cause; it is a result. It is a result of insufficient funds for carrying out effective enforcement, which, in turn, reflects no public sense of urgency about curbing encroachment.

There are at least four prerequisites to effective State enforcement of channel-encroachment provisions. They are: (1) a clear State law; (2) satisfactory administrative criteria by which to define channel encroachment and delineate channel-encroachment lines; (3) funds adequate to develop and maintain an engineering organization of sufficient qualified personnel to carry out its responsibilities; (4) systematic procedures to keep the public aware of the existence and provisions of the law.

When these four conditions are fulfilled, the administrative organization can be more assured of obtaining public backing, without which full compliance with the law is not possible.

Detailed maps are required to properly delineate the floodway and floodway fringe areas in the town of Penfield. The needs of the community should be evaluated to determine how accurate the mapping of the flood plain should be. A determination in terms of the most effective way of delineating the flood plain from a legal and social point of view is needed so that monies which are being spent on flood plain zoning can be shifted to the most effective use.

As stated earlier in the description of "Flood insurance," there is a need to counsel communities on benefits of flood insurance and flood plain

regulations. Education of the public will promote more participation in the Flood Insurance Program by the private landowners. Near 100 percent enrollment in the Flood Insurance Program should be strived for by the private property owners in the flood plain.

The education program should schedule public meetings and workshops to increase the public's knowledge of flood plain management techniques and regulations. People often build and expand in the flood plain which the local governments allow because of the lack of knowledge of the consequences. Some of the false reasoning for occupancy of the flood plain has been:

a. The lack of knowledge of the flood hazards.

b. The preference for taking the risk in return for other short-term benefits.

c. The assumption that there is no danger since there are existing structures on the flood plain.

d. The anticipation of flood damage prevention works through flood damage reduction programs.

e. The desire to be near the water for its aesthetic value.

f. The lower cost of flood plain sites when neglecting the cost of flood damage or flood damage protection works.

By educating the public, there would be a reduction of unplanned development in the flood plain. The public would be aware of the adverse impacts so if they decided to build, they would implement flood protection techniques to lower potential damage. It has been recommended that this nonstructural alternative implement flood insurance and flood plain regulations. Although a form of these measures presently exists in the town of Penfield, they can be improved upon.

The preceding pages described numberous methods of improvement that could be utilized:

a. Converting the town of Penfield's participation in the Flood Insurance Program from emergency to regular.

b. Obtaining more detailed maps to outline floodway, floodway fringe, and encroachment lines.

c. Obtaining a detailed flood insurance rate study.

d. Improving statutes to be more definitive and enforceable.

e. Improving zoning ordinances to be more definitive and enforceable.

f. Differentiate floodway and floodway fringe areas.

g. Implementing a "nonconforming uses" clause in the zoning ordinances.

h. Improving building costs in flood plain areas.

i. Reducing encroachment through revisions of flood plain regulations.

j. Expansion of an education program for the public to promote flood plain management.

Alternative G is a viable plan because it builds upon existing flood plain management conditions in the town of Penfield. Implementation of any of the previously described aspects will be an improvement to flood plain management. Alone, Alternative G is an improvement, however, does not meet all of the planning objectives such as: provide flood damage reduction, provide erosion control, improve the water quality, improve the environment or improve recreational opportunities. This alternative also lacks tangible values by which to economically evaluate the improvements. Intangible values, such as health, security, and aesthetics, currently are difficult to evaluate though they are gaining in recognition. Therefore, an economic evaluation was not completed because of the lack of specific cost and benefit data.

Alternative G by itself is not recommended to be feasible Corps plan, therefore, it will not be considered further in this report.

SELECTING THE NED AND EQ PLANS

GENERAL

The principles, standards, criteria, and directives of plan formulation and evaluation requires that alternatives be measured to determine their efficiency in meeting the objectives of the plan formulation process. A National Economic Development (NED) Plan and an Environmental Quality (EQ) Plan must be identified in the evaluation process. The NED plan must, from the national point of view, represent the best return on the investment of economic resources needed for construction. The EQ plan is the alternative plan that provides the greatest net positive benefits to the quality of the environment. Once identified, the NED plan and the EQ plan are compared in a system of accounts against each other, against any other strongly favored or economically feasible plans, and against the "No Action Plan" to select the best plan for recommendation. If the NED plan and the EQ plan are the same, that plan is compared against any other strongly favored or economically feasible plans and against the "No Action Plan."

Seven alternatives were investigated in the previous section. Each alternative provides varying degrees of flood damage reduction in the Panorama Plaza area of Irondequoit Creek. Three alternatives, A, B, and G, were considered further for reasons discussed in the previous section. Alternative A, the "No Action" plan, is always a possibility even though it would not satisfy any of the planning objectives. Alternative B is a structural plan utilizing levees and floodwalls to reduce flood damages in the Panorama Plaza area. Alternative B was investigated at varying levels of protection. Alternative G is a nonstructural plan that would provide flood relief through flood insurance and flood plain regulation measures.

To continue the evaluation process, it is necessary to determine which of the three considered alternatives best meets the national and planning objectives and satisfies the other evaluation criteria. As part of the process, it is helpful to identify the plan that best meets the National Economic Development (NED) objective and the plan that best meets the Environmental Quality (EQ) objective. In order to assist in determining these plans, a summary display of pertinent values has been made and is displayed in Table 8, System of Accounts. Table 9, Summary of Benefits and Costs, displays values used to evaluate Alternative B at four different levels of protection and select the NED plan.

NATIONAL ECONOMIC DEVELOPMENT (NED) PLAN

While the NED plan must satisfy generally all planning objectives and evaluation criteria, it must maximize net benefits. The four alternatives shown in Table 8 are analyzed using the summary data to determine their degree of compliance with these objectives and criteria. Alternative B, with 500-year protection, provides the greatest net benefit, and is therefore selected as the NED plan. Alternative B, with 500-year protection, is represented on Table 8.

Table 8 - System of Accounts

Account	ALTERNATIVE A No Action Base Condition - No Corps Project Non-Federal Interests - Town of Penfield, Monroe County, New York State would continue zoning, FPM, ordinances, land use planning		ALTERNATIVE B 1/ Levee and Floodwall Construct levees and floodwalls along creek by Panorama Plaza at confluence of Allen Creek, internal drainage 500-YEAR PROTECTION		ALTERNATIVE C Nonstructural flood insurance and flood plain regulations	
	Study Area	Rest of Nation	Study Area	Rest of Nation	Study Area	Rest of Nation
NATIONAL ECONOMIC						
a. Beneficial Impacts						
Value of Average Annual Outputs of Goods and Services:						
1. Flood Damage Reduction	None	None	$739,800	None	None	None
2. Affluence	None	None	$ 3,390	None	None	None
b. Adverse Impacts						
Average Annual Costs (study area are non-Federal, rest of nation are Federal)						
1. Project	None	None	$120,500	$251,500	None	None
2. Maintenance and Repair	None	None	$ 74,500	$ 10,200	None	None
c. Net NED Benefits	None	None	+$548,190	-$261,700	None	None
ENVIRONMENTAL QUALITY						
a. Beneficial and Adverse Impacts						
Air Quality	No change	No change	Minimal during construction	No effect	No change	No change
Archeological and Historical						
Ecosystems	No effect	No effect	No adverse impact	No change	No effect	No effect
1. Floral Resources						
Woodland Acreage	Impaired	No change	Some reduction	No change	Impaired	No effect
Wetland Acreage	No change	No change	No impact	No change	No change	No change
Grassland Acreage	Impaired	No change	Reduced	No change	Impaired	Impaired
Endangered Species	Not affected	Not affected	Not affected	Not affected	Not affected	Not affected
2. Faunal Resources						
Fish	Possible adverse affect	Not affected	Improved	Not affected	Possible adverse affect	Not affected
Other Aquatic Wildlife	Possible adverse effect	Not affected	Moderate impact	Not affected	Possible adverse effect	Not affected
Terrestrial Wildlife	Possible adverse effect	Not affected	Little impact	Not affected	Possible adverse effect	Not affected
Endangered Species	Not affected	Not affected	Not affected	Not affected	Not affected	Not affected
Land Resources	Impaired	Not affected	Improved	Not affected	Impaired	Not affected
Water Resources						
1. Groundwater						
Water Table Level	No change	No change	Not affected	No change	No change	No change
Quality	No change	Not affected	Improved	No change	No change	No change
2. Surface Water						
Ponds	No change	No change	No change	No change	No change	No change
Stream Quality	Adverse effect	Not affected	Improved	No change	Adverse effect	No change
SOCIAL WELL-BEING						
Cultural Resources						
Scenery	Deteriorated	Not affected	Improved	Not affected	Deteriorated	Not affected
Archeology	No impact	No impact	No impact	No impact	No impact	Not affected
Educational Opportunity	No effect	Not affected	Improved	Not affected	No effect	Not affected
Recreational Opportunity	Impaired	Not affected	Improved	Not affected	Impaired	Not affected
Health and Welfare						
Community Cohesion	Not affected	Not affected	Minor (reduced bridge access)	Not affected	Not affected removal)	Not affected
Community Growth	Impaired	Not affected	Improved	Not affected	Impaired	Not affected
Displacement of People (temporary)	Some	None	None	None	Some	None
Families Protected	None	None	All in Panorama Plaza	None	Insured financially	None
Noise	No change	No change	High during construction	No change	No change	No change
REGIONAL DEVELOPMENT						
Economic Effects						
Employment	No change	No change	Some increase (construction)	No change	Some reduction (construction)	No change
Business Displacement	No change	No change	Three structures	No change	Gradual displacement	No change
Income	No change	No change	Improved	No change	No change	No change
Public Services	Impaired	Not affected	Improved	No change	Impaired	No change
Property Tax	No change	No change	Improved	No change	Reduced	No change
Property Value	Decreased	No change	Improved	No change	Decreased	No change
Regional Growth	Stagnated	Not affected	Improved	No change	Reduced	No change
Effects on Vulnerable Resources						
Commercial	Impaired	No change	Improved	Some improvement	Impaired	No change
Housing	Stagnated	No change	Improved	No change	Reduced	No change
Nonfarm Businesses	Impaired	Not affected	Improved	Not affected	Impaired	No change
Public Buildings	Impaired	Not affected	Improved	Not affected	Impaired	No change
Recreational Facilities	Impaired	Not affected	Improved	Not affected	Impaired	No change
Roads	Impaired	Not affected	Improved	Not affected	Impaired	No change
Social Effects						
Population Distribution	Slight change	No change	Little change	No change	Slight change	No change
Population Growth	Impaired	Not affected	Possible improvement, minimal impact	Not affected	Minor reduction	No change

1/ The 500-year protection plan is displayed for Alternative B. The costs and benefits for the other levels of protection are presented in Appendices A and B.

ENVIRONMENTAL QUALITY (EQ) PLAN

The EQ plan, like the NED plan, should satisfy the range of national and planning objectives and also emphasize environmental quality. This includes the preservation, restoration, and enhancement of any aesthetic ecological and cultural components of the natural and human environment unique to the Irondequoit Creek area. The EQ Plan must provide net positive benefits to the environment.

The three plans shown in Table 8 were also analyzed to determine contributions to environmental quality, both the primary positive and negative components. The selection of an EQ plan was made from the three viable alternatives based on satisfying the range of EQ objectives and improved environmental quality. All plans which satisfy the planning objectives have inherent positive and negative effects on the environment. The EQ plan is developed to have the minimum amount of negative and maximum amount of positive effects while still fulfilling the basic objective of flood damage reductions.

Alternative A, the no-action plan, and Alternative G, nonstructural plan, do not fulfill any other planning objectives even though they create the least disruption of the environment. Alternatives A and G also have several adverse impacts to the social well-being and regional development of the project area. Therefore, Alternatives A and G cannot be considered as an EQ plan. Alternative B was selected as the EQ plan because, compared to the other alternatives, it provides the greatest net positive benefits to the aquatic and terrestrial habitat while providing an equal level of flood protection.

Table 9 - Summary of Benefits and Costs
Alternative B - Levee/Floodwall
(March 1981 Price Levels)

	50-Year	100-Year	500-Year	SPF
	$	$	$	$
Total Federal Cost	2,988,000	3,085,000	3,312,000	8,802,000
Total Non-Federal Cost	1,588,000	1,588,000	1,588,000	2,453,000
Total Project Cost	4,576,000	4,673,000	4,900,000	11,255,000
Average Annual Benefits 1/	630,810	678,180	743,190	764,040
Average Annual Costs 1/ 2/	427,200	436,000	456,700	1,034,400
Net Average Annual Benefits	203,610	242,180	286,490	-270,360
Benefit/Cost Ratio	1.48	1.56	1.63	0.74

1/ Average annual costs are rounded to nearest hundred dollars.
2/ Based on 7-3/8 percent interest and amortization rate, 50-year project life and maintenance cost.

SELECTED PLAN

DESCRIPTION

The Selected Plan, Alternative B - 500-year level of protection, is a structural alternative that provides flood damage reduction with levee and floodwall improvements. Earthen levees have proven to be a feasible engineering structure where space permits. They also allow for growth of vegetation which helps to blend this type of man-made structure into the natural surroundings. Where levees are not feasible, as in the case of limited space in some reaches, a sheet piling and concrete floodwall will be necessary.

Plate 5 details the approximate locations of the levee/floodwalls along Allen and Irondequoit Creek in the vicinity of Panorama Plaza.

The following plan description is based on a 500-year level of protection, although 50-year, 100-year, and SPF levels were also investigated. The heights of the levees and floodwalls to protect against damaging stages were determined by backwater computations. The heights were established by the difference between the water surface elevation and the bank elevation. Freeboards of 3 feet for levees and 2 feet for floodwalls are included in all computations of the structure heights.

Where possible, levees were given primary consideration over floodwalls because of their lower costs, reduced adverse impact on the aquatic and streamside riparian environment (i.e., preservation of overhanging shade trees along the creek), and lesser impact on terrestrial wildlife habitat and riparian aesthetics in this locale. The levees were designed with a trapezoidel cross section, having sideslopes of 1 vertical on 2.5 horizontal and a 10-foot wide crown. For the 500-year level of protection, the levee/floodwalls range from 1.0 feet to 8.5 feet in height.

Along the left bank, (looking downstream) in the reach along Irondequoit Creek between the Route 441 Bridge and the Panorama Trail Bridge, no flood control structures are proposed because the existing left bank is of sufficient height to prevent overtopping. Along the right bank, a levee will be constructed that will be aligned from a point behind the bowling alley at high ground to the road embankment at the Panorama Trail Bridge. The levee height will range from approximately 2 to 7 feet (including freeboard) for the 500-year level of protection. In this reach, the existing channel would not be disturbed, thereby preserving the natural aquatic habitat.

In the reach between the Panorama Trail Bridge and the Penfield Road Bridge, a levee will be constructed along the right bank. The alignment of the levee would begin at the Panorama Trail Road embankment and continue along the east edge of the Harney Printing parking lot. The printing firm will be acquired because it would not be incrementally justified to construct a floodwall to protect one building. Also, it would not be practical to protect a building that is presently endangered due to its close proximity to the erosive bank. Acquisition of this manner is an effective method of reducing flood damages. Though the initial cost of acquisition is high, the land can be permanently

reverted back to an undeveloped flood plain with low annual damages. Though evacuation of buildings from the flood plain is ordinarily a nonstructural measure, the acquisition of the Harney Printing Building would be a structural measure. The cost of acquisition is not incrementally justified when compared to the flood inundation benefits and recreational development benefits.

The levee will continue along the rear property lines of the commercial properties along Panorama Trail. The average height of the levee in this reach would be 8 to 11 feet. The levee alignment would follow along the outside perimeter of the undeveloped area behind Panorama Plaza. The open space would be preserved to function as both a flood plain and a town recreational park. Sufficient room would be provided to allow truck access behind the plaza. The levee alignment would continue along the edge of the undeveloped area to connect to the high embankment at the Penfield Road Bridge.

Along the left bank, in the reach between the Panorama Trail Bridge and the confluence of Allen Creek, a floodwall would be placed behind the immediate treeline (to preserve the treeline). The floodwall's average height will vary from 1.5 feet upstream to 7.5 feet downstream. The left bank of Irondequoit Creek, north of the confluence, would not require any flood control structures due to its naturally high topography. The topography at this location increases in elevation away from the bank and the absence of valuable structures needing protection negates the need for flood damage protection structures.

In the reach from the Penfield Road Bridge downstream, structural measures will be required along the right bank. A levee averaging 3.5 to 6.5 feet high would begin at the Penfield Road embankment and continue across Old Penfield Road. The levee would continue along the alignment of the private road to the Genesee Conservation League, at an average height of 5 feet. A two-lane private road would be reconstructed on the crest of the levee to maintain access. The levee alignment would turn just north of the Brookhill Apartments and connect to existing high ground. Due to the high velocities in this reach of Irondequoit Creek, erosion protection would be required for the right and then left curved banks just downstream of the Old Penfield Road Bridge.

No flood control structures have been proposed in the downstream reach adjacent to the Genesee Conservation League. The caretakers house may encounter some flood damage during a 500-year event, but it is not economically justifiable to build a levee to prevent minor damage to one house. The access road in this vicinity would also be partially inundated during a 500-year event. The main clubhouse would not encounter any damage because the first floor elevation (270.22) is above the 500-year stage elevation (270.1).

A drainage overflow area would be maintained at the quarry lake to preserve the existing natural overflow condition. During high stages in Irondequoit Creek, water naturally overflows the left embankment and enters and flows through Quarry Lake. A flood stage reducing impact would result by maintaining the natural unaltered condition of the embankment. The embankment would be maintained through flood plain regulations as defined in the non-Federal plan responsibilities sections of this report.

During low flows, both the Old Penfield Road Bridge and the Plaza Extension Bridge are obstructions to the flow in Irondequoit Creek. Though their removal would improve the low-flow characteristics, it is not recommended that the bridges be removed. High velocities can cause serious erosion problems along the creek. The bridges would act as natural drop structures and would aid in reducing the erosive velocities. Riprap is proposed 25 feet upstream and downstream of the Penfield and Old Penfield Road Bridges due to the slightly higher velocities flowing through the bridge openings.

The bridges at Old Penfield Road and the Plaza Extension Road would not be removed, although vehicular access would be discontinued at the Plaza Extension bridge. The use of levees in this alternative would create a ponding area on the creek side of the embankment. During flood periods, the flood plain would be inundated. This would create a potential danger to vehicles if they were allowed to drive over the levees and through the flood plain. By eliminating through-traffic access, this potential danger to the public would be reduced. Pedestrian access would be maintained over each bridge. A gate would be installed in the floodwall along the left bank, at the Plaza Extension Bridge. The gate would allow pedestrian access for employees in the Sybron/Nalge area to frequent the proposed park or Panorama Plaza. A vehicular ramp would be provided over the levee on the plaza side of the Plaza Extension Bridge to allow limited access for maintenance crews. There would be temporary disruption of vehicular traffic over the Penfield Road Bridge during periods of high creek stages.

For the Allen Creek reach, a levee averaging 2 to 10 feet in height, would be placed along the right bank (looking downstream) between the Sybron-Nalge parking lot and Allen Creek. A 3-foot drop structure (constructed of sheet piling), located 850 feet upstream of the confluence, would dissipate energy and reduce velocities slightly. The velocities would vary from 8.8 fps at the drop structure to 3.5 fps near the confluence. The velocities would still be highly erosive, and the length of the channel, approximately 900 feet, would require riprap along the bottom and sides. The channel would have a 30-foot bottom width with 1 to 2.5 sideslopes and would cut a gradient to match the bottom elevation at the 3-foot drop structure.

From the confluence, to a point 400 feet upstream, the new channel would be aligned along the existing channel. The channel in this reach would meander and pools would be established in the location of the present pools. The riprap would be placed in such a manner to create a rough channel with riffle areas. Continuing another 500 feet upstream, the channel would be realigned westerly to allow sufficient room to construct a levee along the east bank. The channel would be constructed along a meandering alignment and have pools with riffle areas.

A low-flow channel would be installed along the entire length of the Allen Creek rechannelization. The riprap would aid in making the low-flow channel more permanent, i.e., the channel would be less likely to flatten out due to erosion. There would be no structures built along the west bank, so the existing riparian vegetation could remain. For the first 400 feet upstream of the confluence, channelization would have little impact upon the vegetation on both banks. Along the next 500 feet upstream, if any vegetation is

destroyed by the realignment, it would be reestablished with grass and tree/shrub plantings.

With the construction of levees and floodwalls, natural internal drainage from the Panorama Plaza area to Irondequoit and Allen Creeks will be hindered. Therefore, engineering measures to rectify this problem are being considered. The amount of land requiring drainage would be about 130 acres for the 500-year level of protection. Internal drainage would be collected by ditches constructed along the backside (side away from the creek) of the levee or floodwall paralleling the creek. Culverts would be used at the downstream collection points to allow the internal waters to naturally flow back into the creek.

As indicated on Plate 6, Interior Flood Control, four areas are indicated which designate specific drainage subbasins. Locations of the proposed drop inlets, culverts, and ditches are also indicated on the plate. Each culvert will include a flapgate and an emergency sluicegate to prevent a backup of creek waters into the interior basin. Any existing outfalls or storm sewers that are within the inside bounds of the proposed levees or floodwalls will be connected into the proposed internal flood control system.

The Panorama Plaza has potential for recreational development. The area located behind Panorama Plaza is currently undeveloped. Although structural flood control measures will consume some of the vacant area, a considerable amount of land would still be available for recreational purposes. Development of a park would best utilize the land by creating a low-damage flood plain. This, in effect, would be a nonstructural measure of flood damage reduction in this area.

The town of Penfield Parks and Recreation Department is currently in the planning stage to develop a town park in the open area behind Panorama Plaza. The preliminary plans indicate two multipurpose fields, a baseball diamond and a playground/picnic area. Sketch 6 shows the location of the recreational facilities proposed for the area. Aside from the increased picnicking and recreational opportunities, the influx of people into the area would be an economic boost for the plaza businesses.

Utilization of the levee for recreational purposes (hiking/biking, bleachers) was considered during the plan formulation stages and in the draft reports. However, because of continuing significant concerns pertaining to health and safety problems, maintenance problems/costs, and structural integrity concerns, the utilization will not be incorporated or encouraged in the final plans.

ENVIRONMENTAL IMPACTS OF SELECTED PLAN

GENERAL

Project construction could have an adverse effect upon the environment. To minimize these effects, the Contractor would be required to minimize temporary environmental impacts such as noise, dust, water turbidity, in accordance with the procedures and regulations outlined in the Civil Works Construction Guide Specification for Environmental Protection (CW-01430, July 1978). It would be the responsibility of the Contractor to prevent or control air pollution, erosion, spillage (including accidental), disposal, burning, turbidity, and maintenance of any pollution control facilities deemed necessary for the project duration.

To insure that the proper protective measures are being followed by the Contractor, the Corps of Engineers is responsible for inspection and testing during the duration of the project. These protective measures and monitoring procedures will control many of the impacts that the project may have on the environment. However, some adverse effects cannot be prevented, due to the disrupting presence of the construction equipment, personnel, and the actual construction activity.

TOPOGRAPHY

The Panorama Plaza, adjacent to the right bank of Irondequoit Creek, is in a low, natural flood plain. Prior to the 1950's period, when Panorama Plaza was built, Irondequoit Creek originally followed a more easterly alignment. The creek was moved further west to obtain additional acreage to construct the plaza and parking areas. The Allen Creek alignment at the confluence was also changed. The confluence with Irondequoit Creek was moved upstream several hundred feet. The alteration to the creek's alignment was confirmed by comparing historical aerial photographs from the Soil Conservation Service, to recent aerial photographs of the area. In the early 1970's, the alignment of Irondequoit Creek, downstream of the Genesee Conservation League, was shifted to the east to create a larger area for quarry operations at Dolomite Inc.

The project has always been prone to annual spring flooding due to the low, flat topography. The area was prone to flooding even before the creek was realigned. The area did not record any significant damages prior to 1950 because the land was used primarily for agriculture.

The Selected Plan proposes to use levees as a structural measure to reduce flood damages. The levees would change the topography of the flood plain by containing the floodwaters. The levee sections were designed with a trapezoidal cross section having sideslopes 1 vertical on 2.5 horizontal and a 10 or 23-foot wide crown.

WATER QUALITY

Changes in land use directly affect the magnitudes of surface runoff and sediment-associated nutrient yield. Long-term changes in the magnitude and frequency of surface runoff can also alter the long-term rate movement of

sediments through the watershed. The Irondequoit Creek Watershed is under continuous pressure of land development. It undoubtedly would accelerate erosion processes and increase sediment-associated nutrient loadings into the creek.

Project construction of the Selected Plan could cause some short-term impacts upon water quality. Channelization of a portion of Allen Creek could reduce the water quality by increasing the turbidity of the water during excavation. Turbidity decreases light penetration which could temporarily affect normal metabolic activity of submerged plants and other aquatic organisms. Construction schedules for channelization could be adjusted to minimize disturbance to migratory and spawning activities of fish life.

Riprap placed along Allen Creek could have a long-term beneficial impact to water quality. During periods of increased flow and velocity, riprap would help increase turbulance and water aeration. Construction along Irondequoit Creek will have little impact upon water quality. There will be no major channelization in Irondequoit Creek. Erosion protection will be placed along the creek at the points designated in the Selected Plan description. Minimal channelization will be required to place the riprap.

With regard to water quality problems, prior studies have shown that land use-related nonpoint sources of pollution are significant in the basin and, that a nonpoint source management plan developed by the county may be necessary to meet water quality objectives. The population growth has resultant pollutants in the form of sediments, nutrients, organic matter, fertilizer, salt, oil, grease, and heavy metals. A variety of these pollutants result from runoff from roads, parking lots, and residences.

However, water quality in recent years has improved in the Irondequoit Creek Watershed. The construction of a more efficient sewage treatment plants in the watershed have contributed toward improved water quality conditions.

The Monroe County Pure Water Agency is the local sponsor implementing the New York State 208 Program (Federal Water Pollution Control Act Amendments of 1972-Public Law 92-500, Section 208). An advisory committee - the Water Quality Management Planning Committee - was set up to coordinate State 208 activities in Monroe County. An Irondequoit Basin subcommittee will investigate nonpoint source pollution, which includes urban runoff and methods of controlling the problem. Some management practices that are being considered by the committee are street cleaning, sewer flushing, limiting road salt use, catch basin cleaning, constructing detention ponds, and in-stream dams.

FISH AND WILDLIFE

There is a population of fish and wildlife in the project area in spite of the concentrated urban development. The wildlife consists of mammals and birds that have adapted to urban areas and human activities. A detailed list of the observed or collected wildlife and fish during the fall and spring sampling is included in the Environmental Impact Statement and Appendix H.

There is an undeveloped strip of land used by terrestrial wildlife, along each bank of Irondequoit Creek and Allen Creek in the project limits. In the Selected Plan, the levees are set back from the creek to preserve the riparian treeline. This will permanently isolate portions of the bank area to conserve wildlife habitat, particularly in the reach between the Route 441 Bridge and the Panorama Trail Bridge. Considering the rapid urban development of the area in recent years, the existing riparian habitat becomes more valuable, in that it provides travel lanes for wildlife in addition to food and cover. Additionally, overhanging riparian vegetation helps shade aquatic areas in the creek for fish and provides a source of detritus in the aquatic food chain.

A valuable riffle-pool area was identified in the immediate downstream area near the Route 441 Bridge. In the Selected Plan, no channelization is proposed for this reach; therefore, there should be no major disruption to this stream area. For the remainder of Irondequoit Creek, minor channelization for placement of riprap will occur at the Penfield Road Bridge, Old Penfield Road Bridge, and on the side banks of the meander downstream. The impacts would be minimal to fish life as described in the previous section, Water Quality.

Major channelization is proposed for Allen Creek. The proposed design for Allen Creek will have a long-term beneficial impact. Bank riprap will be placed along approximately 900 feet of the channelized creek. This reach will be channelized along a meandering alignment. Man-made riffle and pool areas will be included in the design. Where there is no existing woody vegetation along the creek banks, trees and shrubs will be planted to improve creekside shade cover. A low-flow channel will be installed to maintain a sufficient concentrated flow for fish migration. All of these aspects of the Allen Creek design plan may enhance the fisheries habitat and help mitigate loss of habitat disrupted or destroyed by construction.

TERRESTRIAL VEGETATION

As stated previously, in this area of high urban development, preservation of terrestrial vegetation values for fish and wildlife becomes even more important from both an ecological and an aesthetic point of view. In the Selected Plan, construction of levees/floodwalls and channelization of Allen Creek will alter or destroy some existing riparian vegetation.

In the reach of Irondequoit Creek, between the Route 441 Bridge and the Panorama Trail Bridge, the levee proposed along the right bank (looking downstream) would be set back behind the treeline. Only a few trees would be destroyed and some existing forb/grasslands would be eliminated by construction of the levee. The levee would be revegetated with a grass or grass/legume mixture. Additionally, the creekside could be left unmaintained to allow for succession of native plant species to eventually reinvade planted disturbed terrestrial areas.

In the reach between the Panorama Trail Bridge and the Penfield Road Bridge, the levee proposed along the right bank would be aligned along the outside perimeter of the open space. No woodlands would be impacted. Construction

of the levee would destroy forb/grasslands along its alignment. The levee would be replanted to herbaceous plant species. The proposed town park would have a larger impact upon the forb/grasslands by converting it into a recreational area. Construction of the floodwall along the left bank would destroy numerous trees. However, the immediate treeline, approximately 20 feet wide along the bank, would be conserved. The floodwall would isolate this area to create a relatively undisturbed terrestrial wildlife habitat.

Channelization and construction of the levee in the Allen Creek reach would cause considerable loss to riparian woodlands. Channelization and riprap placement in the lower half of the reach would have minimal impact on the stream's natural meander because the proposed alignment would follow the existing channel. In the upper half of the project reach, the channel would be realigned to cut into the left bank where some trees will be destroyed. The placement of the levee along the right bank will eliminate a majority of the tree and low vegetation cover. New plantings of trees and shrubs would be placed in areas where vegetation could not be conserved by construction.

In the reach along Irondequoit Creek, downstream of the Penfield Road Bridge, a levee would be constructed behind the treeline along the right bank. Very little riparian vegetation would be affected in this reach.

WETLANDS

There are no existing wetlands in the project area. Therefore, construction of the Selected Plan will have no direct impact upon wetlands. In the lower reaches of Irondequoit Creek, the waters flow through significant wetlands before entering Irondequoit Bay. These wetlands could be indirectly affected by the increased suspended sediment transport as a result of channelization activity along Allen Creek. Additional information is presented in Paragraphs 4.05 and 4.06 of the EIS.

RECREATION

The town of Penfield Parks and Recreation Department is currently in the planning stage to develop a town park in the undeveloped open space behind Panorama Plaza. The levees proposed in the Selected Plan will require some land along the outside perimeter of the open space. However, sufficient lands will be available for recreational development. The park land will be inside the levees and will be more prone to spring inundation. Any residual ponding would be temporary due to the absorbancy of the sandy soils. Damage caused by spring flooding would be minimal and be reduced to cleanup/grooming maintenance.

The levees could add a beneficial impact to the recreational park. The levee would isolate the park to promote a safer environment from the plaza traffic. Appropriate maintenance/pedestrian access facilities (gate, ramps), however, will be provided to the vicinity. Utilization of the levee for recreational purposes (hiking/biking trail, bleachers) was considered during plan formulation and in the draft reports. However, because of continuing significant concerns pertaining to health and safety problems, maintenance problems/costs, and structural integrity concerns, this utilization will not be incorporated or encouraged in the final plans.

Aside from the increased picnicking and recreation opportunities, the influx of people using the park would be an economic benefit for the plaza business.

CULTURAL RESOURCES

In order to assess the impacts of the proposed project on significant resources, the 18 March 1980 edition of the National Register of Historic Places and all subsequent revisions were consulted. No places exist in the project area. In order to determine if previously undiscovered, potentially significant cultural resources were located within the project area, a reconnaissance level survey was performed. The results of that survey were negative.

AIR QUALITY

The quality of the air would be unavoidably affected by the dust, noise, and emissions resulting from the operation of construction equipment. However, the construction Contractor would be required to reduce these emissions and effects to a minimum. The air quality monitored in Monroe County is considered to be "generally clean" by environmental health officials. The Environmental Protection Agency has established national standards and regulations to control air emissions.

DISPLACEMENT OR ACQUISITION

The State will be required to acquire lands, easements, and rights-of-way for construction and subsequent maintenance of the project. The acquirement of lands for temporary and permanent easements would not displace any businesses or residences in the Panorama Plaza area. Only one business, Harney Printing, located on Panorama Trail on the northeast side of the bridge, would be displaced. The building had been built adjacent to the creek and only 5 feet from the top of bank. The instability of the sandy soils and the continuous erosion process poses a threat to the building's foundation. To design and construct a floodwall and erosion protection to protect one building would be very expensive. Such a cost would not be incrementally justified.

Two buildings would be moved in Camp Haccamo, a day camp for handicapped children, located behind the Sybron-Nalge property. Moving the buildings would allow sufficient room to construct the levee and to tie it into existing high ground behind the camp. The buildings currently serve as bunkhouses. They could be moved to another location on the camp property. For cost estimating purposes, the buildings were assumed to be acquired.

Permanent acquisition will be required for channelization, levee construction, ponding areas and flowage easements. All construction is to be done within the permanent acquired lands and no temporary easements will be required. The total land area to be acquired is approximately 22 acres. This land is primarily undeveloped except for the structures mentioned above.

As indicated in the Selected Plan description, the bridges at Old Penfield Road and the Plaza Extension Road would remain in place, although vehicular access would be discontinued. A potential danger to the public would be

reduced by eliminating vehicular traffic access in the flood plain inward of the levees. A gate would be installed in the floodwall along the left bank at the Plaza Extension Bridge. The gate would allow pedestrian access to the proposed park or Panorama Plaza from the Sybron-Nalge area. Maintenance access to the park would be provided over the levee by construction of a vehicular ramp on the plaza side of the Plaza Extension Bridge.

EMPLOYMENT AND BUSINESS

With the flood protection provided by the Selected Plan improvements, there may be enhanced business activity in the area as a result of the improvements. There would be considerably less business days lost due to flooding because of protection offered by the structural alternatives. There would be no new development because the area is currently well developed. The existing businesses may remodel or expand their buildings to remain within the flood plain regulation for new development.

FLOOD PROTECTION

An 0.2 percent chance, or 500-year level of protection is recommended for the project area. This decision was reached based on an evaluation following ER 1105-2-111 Flood Damage Prevention: Level of Protection for Urban Areas. Elements evaluated included possible loss of life, flood impacts, desires of flood interests, economic, environmental, social considerations and other factors such as design considerations. The rationale for selecting a 500-year level of protection over lesser degrees of protection was previously discussed in the Section on Selecting the NED and EQ Plans. The rationale for not selecting a higher degree of protection, specifically the SPF, follows.

Providing an SPF level of protection would not be economically justified as detailed in Appendix B. The approximate $21,000 of annual residual damages would not support the additional $6 million cost to build an SPF project in lieu of the 500-year level of protection.

Flood damages for an occurrence of the SPF are estimated at $250,000 for Reach 1, $18,000,000 for Reach 2 and $3,700,000 for Reach 3 for a total of $21,950,000. These damages would occur with or without the recommended project at a 500-year level of protection.

These damages are not considered extensive enough to permanently cripple activities in the area and are therefore not catastrophic.

The potential for loss of life is considered noncatastrophic as a flood warning system is included in the Selected Plan to provide a mechanism for alerting residents and businesses of an impending flood which might overtop the recommended levees. The rate of flood stage increase for the SPF is estimated at approximately 1.0 feet/hour. The amount of time before the levees would be overtopped is estimated at approximately 6 hours. This would provide sufficient time to implement emergency evacuation.

The flood warning system will consist of stream and precipitation gages located upstream that will be connected to an alarm at a police station near the project area. Other features of the system could also include an air alarm in the project area to be activated by the police, signs at strategic locations in the project area showing evacuation routes, and a public information program to explain the system and evacuation procedures. The flood warning system and evacuation plan will be developed in more detail during Advanced Engineering and Design phases of the study. A requirement to operate and maintain the warning system including an evacuation plan will be included as an item of local cooperation.

DESIGN CONSIDERATIONS

GENERAL

Design of the Selected Plan is based on hydrologic and hydraulic data presented in Appendix G and geotechnical data presented in Appendix E of this report. In addition, Appendix A and B provides data on benefits and costs that influence the size of the project plan and feasibility of the Selected Plan via a procedure of optimizing. In selection of the optimum economic level of flood protection for the study area, annual costs, and benefits were developed for 50-year, 100-year, 500-year, and SPF levels of protection.

GEOLOGY

Physiography

Irondequoit Creek and its major tributary, Allen Creek, flows through the Ontario Lake Plain and Erie-Ontario lowland. The surficial deposits which are of fluvial, glacial, and lacustrine origin are composed of sand, clay, silt, and boulders. The hummocky topography of the Irondequoit Creek area is characteristic of Pleistocene glaciation deposition. The wide river valley with steep bluffs is a result of Irondequoit Creek flowing through an ancient buried valley.

Bedrock Geology

The area bedrock consists of shales, limestones, dolostones, and sandstones of Ordovician, Silurian, and Devonian age.

Fluvial Processes

Irondequoit Creek is a meandering stream which transports sediment that ranges from sand to gravel size. Areas of active erosion have been identified in kame terraces, outwash deposits, as well as along the valley walls of the gorge. Deposition occurs as bars which are located throughout the stream.

Geotechnical Design

Geotechnical data was obtained from other agencies, borings, field tests, and laboratory tests to determine the erodibility of the stream banks.

Floodwall, levees, and riprap were the possible considerations addressed. Because of the channel velocities and soil characteristics, the slope stabilities and erodibilities must be considered for this project. For the channelization scheme, slopes of 2.5H on 1V will receive 6 inches of graded bedding and 18 inches of graded riprap. The levees are designed to use a semipervious core having 2.5H and 1V slope with selected reaches of bedding and riprap. For areas of limited construction space, floodwalls will be constructed. Details of design for these improvements are given in Appendix E.

STRUCTURAL DESIGN

The structural design details of the Selected Plan are presented in Appendix D, Design; and Appendix E, Geotechnical. The Selected Plan, Alternative B, utilizes levees, floodwalls, and some channelization on Allen Creek to provide flood damage reduction in the Panorama Plaza area.

Backwater computations, using the difference between stage elevation and bank elevation, were used to establish the heights of the levees and floodwalls. Freeboards of three feet for levees and two feet for floodwalls were included in all computations. Levees are proposed wherever an acceptable vacant strip of land could accommodate its base width, and floodwalls are proposed where physical limitations existed. The levee sections are designed with a trapezoidal cross-section having side slopes of one vertical on 2.5 horizontal with a 10 or 23-foot wide crown. The height of the levees vary with the topography and flood stage levels. The slope of the levee would have vegetation plantings that would not only be aesthetically suitable but also have characteristics that would retard erosion.

The alignment of the levees and floodwalls will impact upon the utilities in the study area. Sanitary sewer manholes will be raised along the alignment and manholes located near the levee alignment in the flood plain will be floodproofed. Several power poles will be relocated. The Monroe County Pure Waters chemical feed station, located behind Panorama Plaza, would be floodproofed.

Channelization is proposed for the lower reach of Allen Creek. Channel work would consist of removing the soft material in the creek channel and banks to form a trapezoidal cross section shape having side slopes, one vertical on 2.5 horizontal. The improved channel dimensions consisted of increasing the width, depth, and cross-sectional area of the average channel. Topographical limitations restricted the use of channelization only, to increase channel capacity. In the areas where the improved channel was not sufficient, the banks were supplemented by a levee to give the additional height required to prevent overtopping the bank. Channelization of Allen Creek would include a low-flow channel to maintain an adequate fisheries environment.

Due to the high erosive velocities that are present in Allen Creek and due to the silty-sandy composition of the soils in the area, the lower reach of Allen Creek would be riprapped. The riprap would provide erosion protection for the channel sideslopes and would maintain the low-flow channel.

Two bridges, the Old Penfield Road Bridge and the Plaza Extension Bridge, restrict the flow of Irondequoit Creek. However, during high flows, the

bridges serve as effective dropstructures, therefore; they will remain in place. Vehicular access will be eliminated for the Plaza Extension bridges due to the potential danger during floods. Sufficient vehicular access can be maintained by other major roads that transverse the plaza area. Pedestrian access will be maintained at the two bridges to allow the public access to the plaza or the proposed town park. Temporary disruption of vehicular traffic over the Penfield Road Bridge would occur during high stages.

A two-lane road would be constructed along the 23-foot wide crest of the levee to maintain access for the Genesee Conservation League. Alternate access will be provided during construction.

REAL ESTATE

Lands and rights-of-way required for the selected project plan would be furnished by non-Federal interests and would include project lands for the structures, construction easements, and easements necessary for maintenance of the project. A preliminary estimate was calculated of lands that would be acquired before a construction contract is awarded. The land that would be occupied by the levees, floodwalls, and erosion protection would be permanently used for project purposes and permanent acquisition would be required. Usually, temporary easements are used for construction use and access. For this project, no temporary easements would be necessary. All construction access is readily available along the acquired lands or from the many public roads that transverse the area. Maintenance easements would also be a part of the acquired lands to provide maintenance access throughout the life of the project. Approximately 22 acres of land would be acquired for the Selected Plan Full value is taken for acquisition of all lands.

For alignment of the flood control structures, it would be necessary to acquire three buildings in the project area. The buildings are the Harney Printing building and two bunkhouses at Camp Haccamo. It is possible that the two bunkhouses could be moved, but for the estimate for this report, they were assumed to be acquired.

The total cost for the lands, easements, and acquisitions is $1,544,760 for the Selected Plan. Cost estimates for each level of protection for Alternative B are presented in Appendix A.

All land acquisition, easements, rights-of-way, and areas needed for construction, including necessary borrow and spoil areas; and subsequent maintenance of the project would comply with applicable provisions of the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970," Public Law 91-646, approved 2 January 1971. Furthermore, non-Federal interests would hold and save the United States free from damages due to the construction and maintenance of the work, except for damages due to the fault or negligence of the Government or its Contractor.

CONSTRUCTION

Construction of the selected project would be completed in one construction season. Quantities of construction materials are readily available from

suppliers in the Rochester Metropolitan Area. Access to the site for construction purposes is also readily available from the numerous roads that traverse and parallel the Panorama Plaza study area.

OPERATION AND MAINTENANCE

The normal maintenance of local flood control projects is a non-Federal responsibility and periodic field inspections would be made by both non-Federal representatives and Corps of Engineer personnel. The non-Federal local cooperator for this project would be the New York State Department of Environmental Conservation (DEC). The responsibility for maintenance would rest with DEC unless a county or town agency is designated when local assurances are obtained. The various items of maintenance would include: care of vegetative plantings such as mowing and trimming; replacement of erosion protection materials or adjustments; maintenance of the flood warning system; clearing drainage ditches and ponding areas; internal drainage inspection to insure they are free and clear and operable; and inspection of the earth levees, concrete walls, and creek channel to determine if there are any repairs necessary or obstructions in the channel. The Panorama Plaza Extension Road Bridge would not require replacement as it does not serve as a significant factor in the operation of this project. If it were removed, the non-Federal interests may consider reconstructing a footbridge to maintain access. Vehicular traffic access would be maintained at the old Penfield Road bridge. The open space area would require mowing and trimming to maintain existing preproject condition or better. No recreational structures (bike paths, bleachers) are encouraged to be constructed on the levees which may threaten the levees effective operation. Maintenance concerns, as stated in NYSDEC letter dated 27 May 1981 in Appendix G, will be addressed further in the detailed design stage. It would be most important that the project be inspected periodically and maintained to insure that the project is functioning as intended to reduce overbank flooding.

ECONOMICS OF THE SELECTED ALTERNATIVE

GENERAL

The economics of the selected plan are presented in detail in Appendix B to this report and include details of the methodology, costs, benefits, damages, justification, and optimization. Pertinent details of these items are discussed below. The affected area was limited to only the immediate project area, located in the vicinity of Panorama Plaza along Irondequoit Creek at the conjunction of Allen Creek.

METHODOLOGY

Evaluations were made of residential, commercial, and public structures in the flood plain to determine damages that could be expected at various flood levels, based on stage versus damage relationships. The evaluations were established from field inspection and interviews with store and business owners. Benefit categories include flood damage reduction and possible intensification of commercial activities.

FLOOD DAMAGES

Average annual damages were developed based on stage-frequency relationships and stage-damage information. Water surface profiles for 50-year, 100-year, 500-year, and SPF flood conditions were developed and used as a base for determining flood damage along Irondequoit Creek. Through interviews with flood plain occupants, damage estimates were obtained. The estimated damages that would be caused by flooding were plotted against the corresponding stages at each index point.

BENEFITS

Benefits are the difference between average annual damages with or without the project. In addition, residential affluence benefits were computed. The affluence benefit is a measure of the increased average annual residential inundation damages resulting from the effect of rising per capita income on the value of the real property and contents in constant dollars. Table 10 summarizes the benefits for the levee/floodwall alternative.

COSTS

The costs and annual charges for the considered alternatives are presented on Tables 11 and 12. The costs detailed in Appendix A are based on March 1981 development and price levels. All estimates for average annual cost are based on an interest and amortization rate of 7-3/8 percent over a 50-year project life. Total Federal costs for Alternative B include costs for channels, levee/floodwalls, utility relocations, bank protection, and interior drainage. The total non-Federal costs are comprised of costs for utilities relocation, and temporary and permanent land acquisition. The total first cost is the investment cost since the project would be constructed in one construction season and no interest during construction is included.

Table 10 - Summary of Average Annual Benefits - Selected Plan
Alternative B - Levee/Floodwall

Item	Level of Protection 500-Year
	$
Existing Conditions	
Flood Inundation Reduction 1/	739,800
Future Conditions	
Affluence	3,390
Total	743,190

1/ Includes public and other.

Table 11 - Summary of Annual Costs

Item	Alternative B - Levee/Floodwall 500-Year
	$
FEDERAL	
First Cost	3,312,000
Interest During Construction	0
Investment Cost	3,312,000
Annual Charges 1/	
Interest 2/	244,300
Amortization 3/	7,200
Maintenance 4/	10,200
Subtotal	261,700
NON-FEDERAL	
First Cost	1,588,000
Interest During Construction	0
Investment Cost	1,588,000
Annual Charges 1/	
Interest 2/	117,100
Amortization 3/	3,400
Maintenance 5/	74,500
Subtotal	195,000
TOTAL ANNUAL COST	456,700

1/ Annual charges rounded to nearest hundred.
2/ 7-3/8 percent.
3/ 7-3/8 percent 50-year life.
4/ $300 inspection, $9,900 gage operation.
5/ Includes $1,000 for the flood warning system maintenance.

The maintenance cost is based on standard estimating procedures using 1.5 percent of the total first costs. The actual annual maintenance cost based on similar projects may be considerably less.

Table 12 - Summary of Benefits and Costs
(March 1981 Price Level)

	Alternative B Levee/Floodwall 500-Year
	$
Total Federal Cost[1/]	3,312,000
Total Non-Federal Cost[1/]	1,588,000
Total Project Cost[1/]	4,900,000
Average Annual Benefits[2/]	743,190
Average Annual Cost[2/3/]	456,700
Net Average Annual Benefits[2/]	286,490
Benefit/Cost Ratio	1.63

1/ Rounded to nearest thousand dollars.
2/ Rounded to nearest hundred dollars.
3/ Based on 7-3/8 percent interest and amortization rate, 50-year life, maintenance cost.

ECONOMIC JUSTIFICATION

The summarized benefits and costs of the considered alternatives are presented in table 12. The ratio of the average annual benefits and average annual cost, known as the B/C ratio, is an indicator of economic efficiency and project justification. Alternative B provides the highest net benefits overall, with the 500-year protection plan being the highest net-benefit plan. Alternative B is the National Economic Development (NED) plan, it also meets allof the planning objectives to become the Selected Plan.

DIVISION OF PLAN RESPONSIBILITIES

FEDERAL

The Federal Government would design and construct the various features of the project plan selected in this Final Feasibility Report. The Federal costs include cost for levees and floodwalls, channelization, erosion protection, interior drainage system, and mitigation measures necessary to minimize or prevent adverse environmental impacts. The Corps of Engineers would also periodically field inspect the project to determine if the project works are being properly maintained by non-Federal interests sufficient for its intended functioning. The total Federal first cost for 500-year protection in Alternative B is $3,312,000. The annual Federal inspection cost is estimated to be $300. The amount $9,900 is included in the Federal annual maintenance cost for continued operation of the gages for the life of the project. The Corps of Engineers will cooperate with the United States Geological Survey to maintain and operate existing stream gages on Irondequoit Creek at Linden Avenue (Gage Number 04232047) and Allen Creek near Rochester (Gage Number 04232050) to continue records of hydrologic events for monitoring project operation. The continued operation of the gages is necessary to collect uninterupted data to evaluate the effectiveness of the Federal project. The gages will also assure more accurate data for future hydrologic studies. The costs were estimated using March 1981 price levels. The total Federal first cost for the selected level of protection in Alternative B is presented in Table 12.

NON-FEDERAL

The New York State, Department of Environmental Conservation, is the non-Federal (local) sponsor, and will be required to enter into a local cooperation agreement normally required by the Corps of Engineers for local flood protection projects, prior to start of construction and in accordance with Section 221 of the Flood Control Act of 1970 and Section 80 of the Water Resources Development Act of 1974. Some of the items in the agreement reflect current Corps policy regarding claims for damages and reflect items that are current policy of other Federal agencies regarding use of the flood plain. Therefore, the items of local cooperation reflect the spirit of these policies and local interests must furnish assurances to the Secretary of the Army that they will:

a. Provide without cost to the United States, all lands, easements, and rights-of-way necessary for construction and subsequent maintenance of the project works, including necessary borrow and spoil areas;

b. Hold and save the United States free from damages due to the construction and maintenance of the works except for damages due to the fault or negligence of the Government or its Contractors;

c. Take over, maintain, and operate the project after completion, in accordance with regulations prescribed by the Secretary of the Army;

d. Accomplish, without cost to the United States, all necessary changes in appurtenant utilities, sewers, and special facilities;

e. Enact and enforce flood plain management regulations, meeting the standards established by the Federal Emergency Management Agency for the National Flood Insurance Program under the National Flood Insurance Act of 1968 and the Flood Disaster Act of 1973.

f. Comply with the applicable provisions of the uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved 2 January 1971, in acquiring lands, easements and rights-of-way for construction and subsequent maintenance of the project, and inform affected persons of pertinent benefits, policies, and procedures in connection with said Act.

g. Prevent any encroachment of flood channels and ponding areas, if required, which would decrease their effectiveness, and if ponding areas and capacities are impaired, promptly provide substitute storage capacity or equivalent pumping capacity without cost to the United States.

h. Operate and maintain a flood warning system including an evacuation plan for project area residents, to be utilized during potential floods that may exceed the project's design level of protection.

The total estimated non-Federal first cost for 500-year protection in Alternative B is $1,588,000. As mentioned previously, non-Federal interests must maintain the project periodically to insure its intended functioning. Vegetative plantings must be cared for, the culverts must be inspected, cleared and checked for proper operation, the channel in the project area cleared of any debris, flood warning system maintenance, erosion protection repair, drainage ditches cleared, and the levee and walls repaired when necessary to prevent failure or further deterioration. The annual non-Federal maintenance cost is estimated to be $74,500 for the Selected Plan.

Flood plain regulations as stated in item e, above, should be enacted and enforced in the floodway of the project area as defined by the 100-year flood outline (improved) from the Rt. 441 Bridge to a point 500 feet downstream of the quarry lake. A map indicating the 100-year flood plain for with and without project conditions for implementation of flood plain management regulations is provided on Plate 1 of this report.

COST-SHARING POLICY

The President, in his June 1978 water policy message to Congress, proposed several changes in cost-sharing for water resources projects to allow States to participate more actively in project implementation decisions and to equalize cost-sharing between structural and nonstructural flood damage prevention projects. These changes include a cash contribution from benefiting States of 5 percent of the first costs of construction assigned to nonvendible project purposes and 10 percent of the first costs of construction assigned to vendible project purposes. Application of this policy to the Irondequoit Creek project would require the State of New York to contribute an estimated $245,000 in cash (5 percent of $4,900,000, total estimated project first costs of construction assigned to nonvendible project purposes based on March 1981 price levels).

The President also proposed that the present cost-sharing requirements for flood damage prevention projects be modified to require a cash or in-kind contribution equal to 20 percent of the project first costs assigned to flood damage prevention. (In the case of reservoir projects, this cash or in-kind contribution is a new requirement), (In the case of local protection-type projects, this cash or in-kind contribution is in lieu of the existing requirement that local interests provide without costs to the United States all lands, easements, rights-of-way, and relocations or replacements necessary for the construction of the project). Application of this policy to the Irondequoit Creek project would require that non-Federal interests make, in addition to the State contribution, a cash or in-kind contribution of an estimated $980,000 (20 percent of $4,900,000). The combined non-Federal share is currently estimated to be $1,225,000 to recommend construction authorization for the Irondequoit Creek project in accordance with the President's proposed cost-sharing policy.

PLAN IMPLEMENTATION

This report is the final report by the Buffalo District office. It must be reviewed by North Central Division Office, the Board of Engineers, and Office of the Chief of Engineers of the Corps of Engineers. It is then sent to appropriate Federal and State agencies for further review and comment. When the comments have been received, the Secretary of the Army submits the report together with the comments of these agencies to the Office of Management and Budget and Water Resources Council for advice as to relationship to the program of the President. Upon receipt of the comments of that office, the report is submitted to Congress with transmittal letter including the recommendations of the Chief of Engineers. Congress, after receiving the report, reviews it. After they review the report, if they are in favor of it and believe it worthy, they authorize it. Since the cost of this project is under maximum limit for action under Section 201 of the 1965 Flood Control Act, it is probable the project would be authorized by action of the Public Works Committees of the Senate and House, respectively. After the project is authorized, the Corps requests funds to initiate work. Congress appropriates funds, by separate action from the authorization. Upon receipt of funds, the Corps initiates detailed planning, coordinates with local interests, and then completes the detailed planning. When the results are approved by the Chief of Engineers, the Corps completes plans and specifications for use by a Contractor in building the project. Non-Federal interests at this time must furnish required local cooperation, including the appropriate cash contribution. After the necessary cooperation is received, the Corps advertises and awards a construction contract to build the project. After construction is completed, the normal maintenance of the flood control project is a non-Federal responsibility. Periodic field inspections will be made by both non-Federal representatives and Corps of Engineers personnel.

The Executive Order 11988; Flood Plain Management; 24 May 1977, requires that Federal agencies avoid development in base flood plains unless no practicable alternative to such development exists. It is the policy of the Corps of Engineers to formulate projects which, to the extent possible, avoid or minimize adverse impacts associated with use of the base flood plain and avoid inducing development in the base flood plain, unless there is no practicable alternative. The decision on whether a practicable alternative exists will be based on weighing the advantages and disadvantages of flood plain sites and nonflood plain sites. Factors to be taken into consideration include, but are not limited to, conservation, economics, aesthetics, nature and beneficial values served by flood plains, impact of floods on human safety, locational advantage, the functional need for locating the development in the flood plain, historical values, fish and wildlife habitat values, endangered and threatened species, Federal and State designations of wild and scenic rivers, refuges, and in general, the needs and welfare of the people. The Irondequoit Creek Selected Plan is structural, but has been determined to be the only practicable alternative. Flood Plain Management policies have been enacted for the area. The Executive Order has been complied with for the Irondequoit Creek study. More information on the projection of land use for the Corps compliance with the Executive Order is included in Appendix B, Economics, page B-9.

COORDINATION WITH OTHER AGENCIES

VIEWS OF NON-FEDERAL INTERESTS

All coordinating agencies and levels of Government were in favor of the Buffalo District, Army Corps of Engineers study of Irondequoit Creek and its tributaries for flood control. The Monroe County Department of Planning suggested that "the Corps should work from the policy premise that Irondequoit Creek and its tributaries are natural stream bodies that should remain that way." Some development has been allowed to occur in floodprone areas in isolated sections so that the flooding problems are fairly localized and most of the stream corridor remains in a near-natural state.

The New York State Department of Conservation (NYSDEC) supports the nonstructural measures as being most effective in preserving the integrity of this watershed. NYSDEC expressed concern that "a structural plan for levees and channelization of Irondequoit Creek in the Panorama Plaza area must take into consideration the fact that this reach of stream is utilized during the spring by anadromous rainbow trout from Lake Ontario as a passage to higher quality waters upstream. Channelization of this section will negate gains made by the forthcoming sewage diversion. Wide shallow channels will promote summer ambient temperatures that exceed the upper lethal limit to support brown trout and rainbow trout."

The NYSDEC also stated that "it appears that the application of nonstructural measures to alleviate flood problems may have a positive impact on natural resources. Action in this direction at this time could minimize the need for structural measures at a later date. It is recommended that this approach to the problem be purused without delay."

In a letter of comment from the NYSDEC, dated 30 May 1980, several suggestions were made for improvement of Allen Creek. "Environmental enhancement measures, such as drop structures, deflectors, riprap habitat, vegetative plantings, and other habitat improvements could be used to make the project more acceptable." These environmental enhancement measures were included in the Selected Plan.

A letter of comment from New York State Parks and Recreation, dated 17 August 1979, stated "The Feasibility Report well identifies the problems and benefits associated with the several alternate solutions."

The county of Monroe Department of Planning sent a letter of comment, dated 14 September 1979, in regard to the Preliminary Feasibility study. "It is recommended that before any selection is made regarding the best structural method for flood control; that other alternatives, such as reservoirs/retention ponds, perhaps in conjunction with other structural or nonstructural measures; be evaluated to see if they would better meet the total water resource needs of the watershed in a cost-effective manner. Other alternatives were considered but were found to be either economically unjustified or environmentally unacceptable.

In January 1981, the draft of the Final Feasibility Report (FFR) and Draft Environmental Impact Statement (DEIS) was sent out to the public for coordination, review, and comment. Several letters of comment were received as follows: New York State Governor's office, 18 February 1981; New York State Parks and Recreation, 23 February 1981; County of Monroe Office of County Manager, 31 March 1981; Monroe County Environmental Management Council, 1 April 1981; New York State Department of Environmental Conservation, 17 April 1981; New York State Department of Environmental Conservation, 1 May 1981; Irene Gossin, former Penfield Supervisor, 6 May 1981; Benderson Development Company Inc., 7 May 1981; New York State Department of Environmental Conservation, 27 May 1981. Each letter is included in both Appendix G and I. Appendix I includes all of the letters of comment received since coordination of the Draft FFR and DEIS. A Corps response is also presented in Appendix I to address the concerns in each letter.

The Irondequoit DFFR and DEIS have been extensively coordinated with the State, county, town, and village governmental agencies. No responses have been received indicating that the proposed project conflicts with existing State or local flood plain management laws and standards.

Two items brought up at the final public meeting; the closing of Old Penfield Road Bridge and the continuation of the private road to the Genesee Conservation League were considered. The private road would be reconstructed along the 23-foot crest at the levee retaining the two-way traffic capability that presently exists. The feasibility of continued use at the Old Penfield Road Bridge will be further investigated. It was determined that it would not affect the economic feasibility of the project nor change the degree and type of protection. Further investigation of this matter can be accommodated in the detailed design stage.

VIEWS OF OTHER FEDERAL AGENCIES

The United States Department of the Interior Fish and Wildlife Service expressed concern for the water quality in the Irondequoit Creek Watershed.

The Fish and Wildlife Service stated that "any development within the Irondequoit Creek Watershed must not in any way degrade existing or future water quality conditions. Any plan developed must address the important fishery and wildlife resources within the project site."

Several planning conferences between the Fish and Wildlife Service, NYSDEC, and the Corps of Engineers representatives have occurred relative to the study. On 29 March 1979, representatives of the Buffalo District (COE) and of the Cortland field office of USF&WS held a joint field trip to the Panorama Plaza vicinity. The purpose of the trip was to further delineate biological studies for the Irondequoit Creek Flood Control Study area. A joint Scope of Work for the needed biological studies was developed by both agencies and commenced in late fall of 1979. A preliminary report of biological study findings on this Scope of Work was sent to the Buffalo District by Dr. Andrew M. White, Environmental Resources Associates, Inc., in his letter dated 8 February 1980. The final report was received in July

1980 and is included in Appendix H. On 20 February 1980, representatives of the Buffalo District (COE) met in Cortland, NY, with representatives of the USF&WS and NYSDEC. At this meeting, various considered alternatives were presented, environmental concerns were discussed, and more comparable alternative measures were developed. A similar meeting (field trip) occurred on 8 May 1980, to discuss proposed alternatives along Allen Creek. In addition to these meetings, numerous telephone and written communications were transacted.

The U. S. Fish and Wildlife Service has provided comments regarding the Buffalo District (COE) Draft Plan of Study in a planning aid letter, dated 9 February 1977, comments on the proposed Scope of Work for biological studies in a letter dated 27 April 1979, a 1 June 1979 planning aid letter dealing with concerns relating to proposed structural alternatives for the Panorama Plaza area. "The levee/floodwall scheme could provide the required flood protection, and with some modifications, minimize the project-related adverse impacts. Use of levees would avoid extensive streambed alterations and, therefore, lessen the possibility of decreased water quality and downstream impacts. The levees should be set back from the creek bank to preserve the riparian vegetation as much as possible. In sections where floodwalls must be used, it becomes even more important to preserve the immediate streamside vegetation on the other bank. Plans to revegetate the levee structures should also be included to further reduce the loss of valuable riparian habitat. Vegetation of equivalent habitat value or a type which would allow for succession of native species should be utilized."

A letter of comment relative to the Preliminary Feasibility Report, dated 13 September 1979, was sent by USFWS. "In areas of expanding development, preservation of habitat to enable continued use of the area by Fish and Wildlife becomes even more important from both an ecological and an aesthetic point of view."

Also, comments regarding the proposed alternatives along Allen Creek were provided in a planning aid letter, dated 19 May 1980. "Development of plans for work along Allen Creek should provide for maintenance of suitable fisheries habitat and allow for passage of migrating fish." USF&WL has reviewed the Selected Plan and others considered in Stage 3 planning. Comments are provided in the Final Coordination Act Report contained in Appendix H.

The USF&WS Coordination Act Report made recommendations and suggestions for consideration in the final design of the project. The following is a list of adopted recommendations which would not increase the cost of the project significantly:

Construction will be scheduled during the period from 15 June to 30 August.

Levee and floodwall structures will be constructed as far back from the stream as engineeringly possible.

Channel construction work along Allen Creek will be confined to one bank or alternated from one bank to another where one bank construction is not feasible.

All disturbed or cleared areas including the levees will be seeded and replanted as soon as feasible upon completion of construction.

Erosion and sedimentation control devices will be employed wherever engineeringly possible.

Channelization will be confined to only the lower 900 feet of Allen Creek, with only minor channelization conducted in Irondequoit Creek (bridge abutments will be riprapped up and down stream at the Penfield Road and Old Penfield Road Bridges in Irondequoit Creek).

Channelization will follow a meandoring alignment in Allen Creek where construction is proposed.

Riprap will consist of large and small stones, placed in an irregular configuration (lower 900 feet of Allen Creek and previously described areas in Irondequoit Creek).

A low flow channel will be incorporated into the new channel design, along with artificial riffle areas and deepened pools, for the 900 feet of new channel in Allen Creek.

A 3-foot deep plunge pool will be constructed at the base of the drop structure in Allen Creek located 900 feet upstream of the confluence of Allen and Irondequoit Creeks.

Detailed plans will be developed for the terrestial vegetative planting program and design and placement of instream aquatic habitat features cooperatively, with NYSDEC, USF&WS, and COE personnel.

All of the above recommendations were included in the formulation of the Selected Plan.

The United States Environmental Protection Agency provided comments on Alternatives B and C in a letter dated 7 September 1979. The comments were considered in the formulation of the Selected Plan.

The USEPA, upon review of the draft of the Final Feasibility Report and Draft Environmental Impact Statement, completed a letter of comment dated 29 April 1981, which states in part, ". . . the U. S. Environmental Protection Agency concurs with your determination that the project is environmentally acceptable, and we have no objections to its finalization." Several letters of comment were received from other Federal agencies during the review period of the draft of the FFR and DEIS. The letters received are as follows: Federal Energy Regulatory Commission, 4 March 1981; United States Department of Agriculture, Soil Conservation Service, 19 March 1981; Department of Housing and Urban Development, 20 March 1981; United States Department of the Interior, 1 May 1981. Each letter is included in both Appendix G and Appendix I. Appendix I includes all of the letters of comment received since initial public distribution of the Draft of the FFR and DEIS and a Corps response to all comments.

The Federal Insurance Administration has the responsibility under Public Law 90-488 to identify the special flood hazard areas of the United States. The Special Flood Hazard Area has been defined as that area subject to a 1 percent or greater annual chance of flooding. In order for FIA to remove the special flood hazard designation from an area "protected" by levees, the area involved should not fall within this definition. The FIA will be coordinated with prior to construction to assure that proper revisions are made to the designated flood hazard areas in the Panorama Plaza area of Penfield, NY, once the Federal project is completed.

SUMMARY

The Irondequoit Creek Watershed is located in Monroe, Ontario, and Wayne Counties in central New York State. The area is primarily rural, however, the land use is gradually becoming more urbanized. This urbanization and encroachment into the flood plains has caused increased flooding and related damages.

A structural/nonstructural alternative, levee/floodwall, was proposed to provide flood damage reduction measures in the Panorama Plaza area. Alternative B was designed for 50, 100, 500-year, and SPF flood protection. The Selected Plan (levee/floodwall) was evaluated to determine if it met the planning goals and objectives of this study. The levee/floodwall plan, Alternative B, was selected as the National Economic Development (NED) plan because it maximized net benefits. The levee/floodwall plan, Alternative B, at the 500-year protection level, had a total first cost of $4,900,000 and a benefit/cost ratio of 1.63.

A "primarily nonstructural" plan was formulated in the Stage 3 planning process according to the requirements of Principals and Standards Federal Register, 29 September 1980. The Nonstructural Plan, Alternative G, was developed for comparison with the structural plans. The nonstructural plan did not meet the planning objectives of this study and was not originally recommended for implementation.

The remainder of the Irondequoit Creek Watershed would be provided flood relief through the use of nonstructural plans. However, the effectiveness of implementing the nonstructural methods for flood plain management would require establishing a central committee or agency. It would be the responsibility of the central body to coordinate, regulate, and enforce flood plain regulations.

Although Alternative B was selected as the most economically feasible and environmentally enhancing plan, no adequate Letter of Intent to provide non-Federal project assurances has been received from the non-Federal local sponsor. Therefore, the nonstructural plan was selected for implementation.

CONCLUSION

The alternatives considered in this study are based on a reasonably thorough analysis and evaluation of various practicable alternative courses of action while attempting to best meet the planning objectives. Extensive design and public coordination was performed prior to designating a Selected Plan in the Final Feasibility Report. Any adverse projects effects are addressed and mitigation measures discussed in this report in order to better satisfy the needs of the study area.

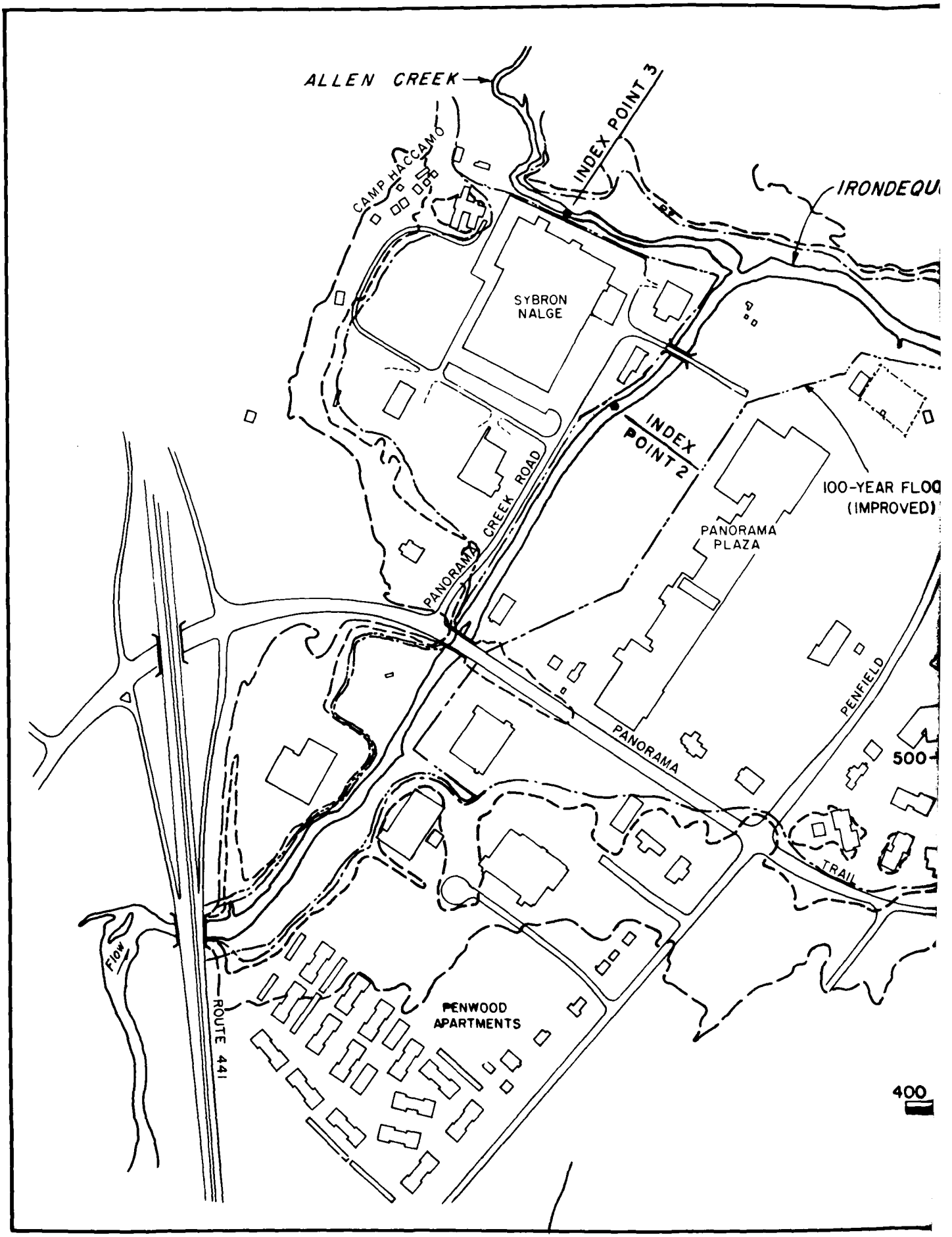
Two items brought up at the final public meeting; the closing of Old Penfield Road Bridge and the continuation of the private road to the Genesee Conservation League were considered. The private road would be reconstructed along the 23-foot crest at the levee retaining the two-way traffic capability that presently exists. The feasibility of continued use of the Old Penfield Road Bridge could be further investigated. It was determined that it would not affect the economic feasibility of the project nor change the degree and type of protection. Further investigation of this matter could be accommodated in the detailed design stage.

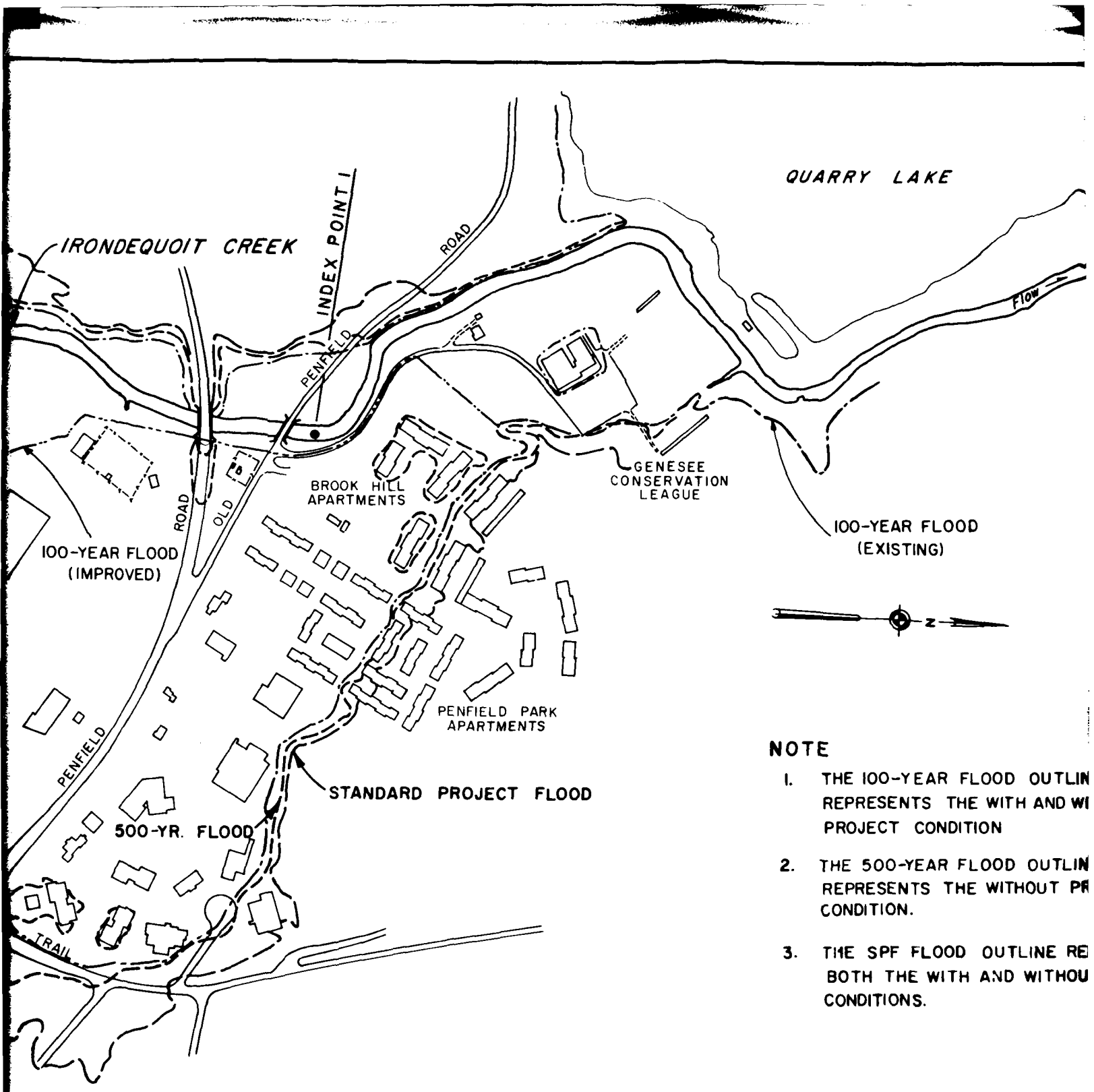
The non-Federal local sponsor did not provide a suitable letter supporting the originally recommended structural plan. Therefore the nonstructural plan, with no Corps participation, that could combine flood insurance, flood plain regulations, flood warning, and flood proofing under an institutional framework was selected as the recommended plan. The non-Federal sponsor provided a letter dated 18 May 1982, concurring with the Corps recommendation of no Federal participation in the Irondequoit Creek Flood Damage Reduction Study. The letter is contained in Appendix F.

RECOMMENDATION

I recommend that the local Governments in the Irondequoit Creek Watershed, including the town of Penfield, implement a nonstructural plan with no Corps participation.

Joseph V. Creedon, MAJ
for GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer


ALLEN CREEK
INDEX POINT 3
CAMP HACCAMO
IRONDEQU
SYBRON NALGE
INDEX POINT 2
CREEK ROAD
PANORAMA
100-YEAR FLOO
(IMPROVED)
PANORAMA PLAZA
PENFIELD
PANORAMA
500
TRAIL
FLOW
ROUTE 441
PENWOOD APARTMENTS
400



NOTE

1. THE 100-YEAR FLOOD OUTLIN REPRESENTS THE WITH AND WI PROJECT CONDITION
2. THE 500-YEAR FLOOD OUTLIN REPRESENTS THE WITHOUT PR CONDITION.
3. THE SPF FLOOD OUTLINE RE BOTH THE WITH AND WITHOU CONDITIONS.

SCALE OF FEET

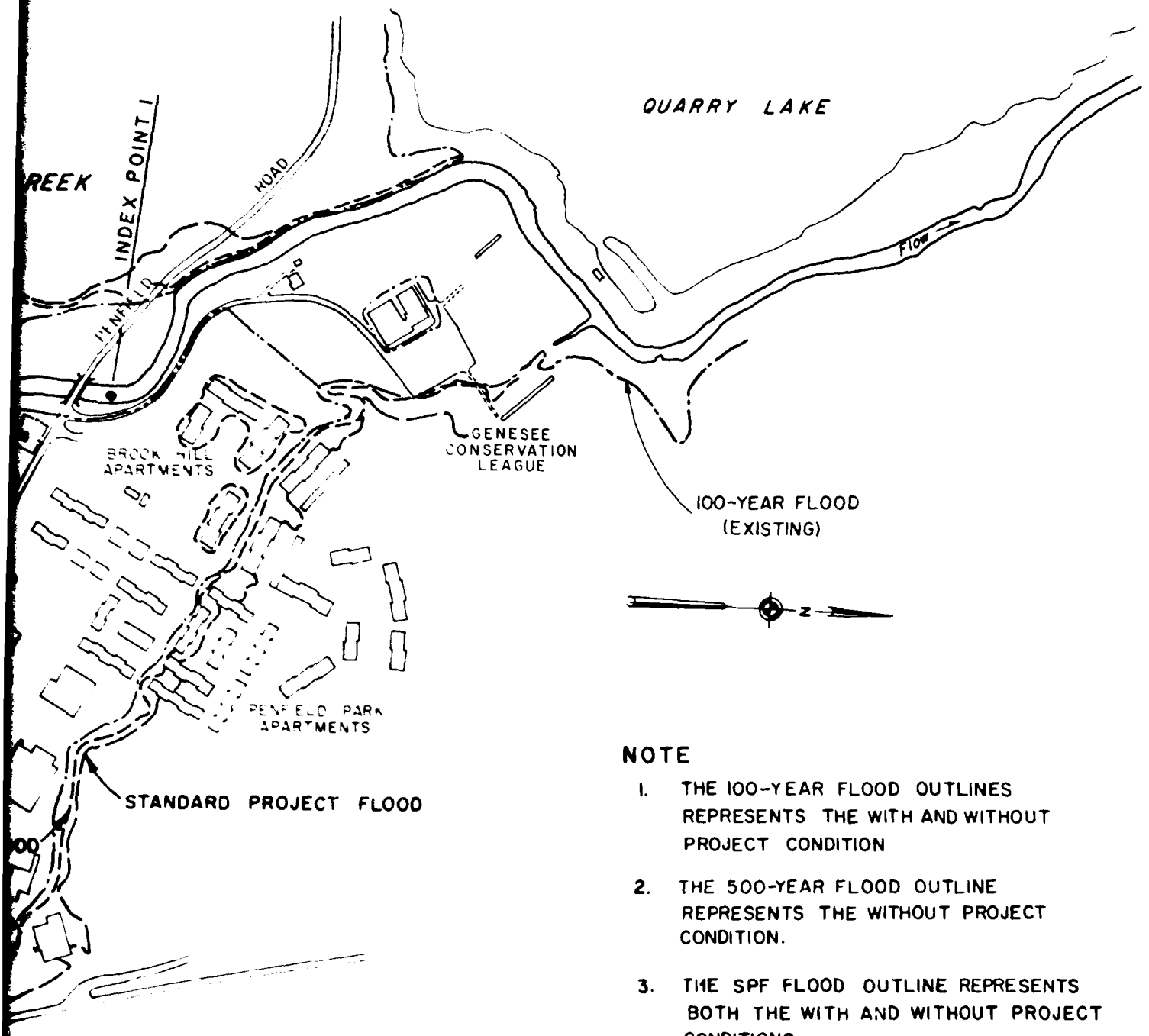
400 0 400 800

IRONDEQUOIT CRE
PANORAMA PL
PENFIELD,

FLOOD O

FINAL FEASIBI

U.S. ARMY ENGINEER
19



NOTE

1. THE 100-YEAR FLOOD OUTLINES REPRESENTS THE WITH AND WITHOUT PROJECT CONDITION
2. THE 500-YEAR FLOOD OUTLINE REPRESENTS THE WITHOUT PROJECT CONDITION.
3. THE SPF FLOOD OUTLINE REPRESENTS BOTH THE WITH AND WITHOUT PROJECT CONDITIONS.

CALE OF FEET

0 400 800

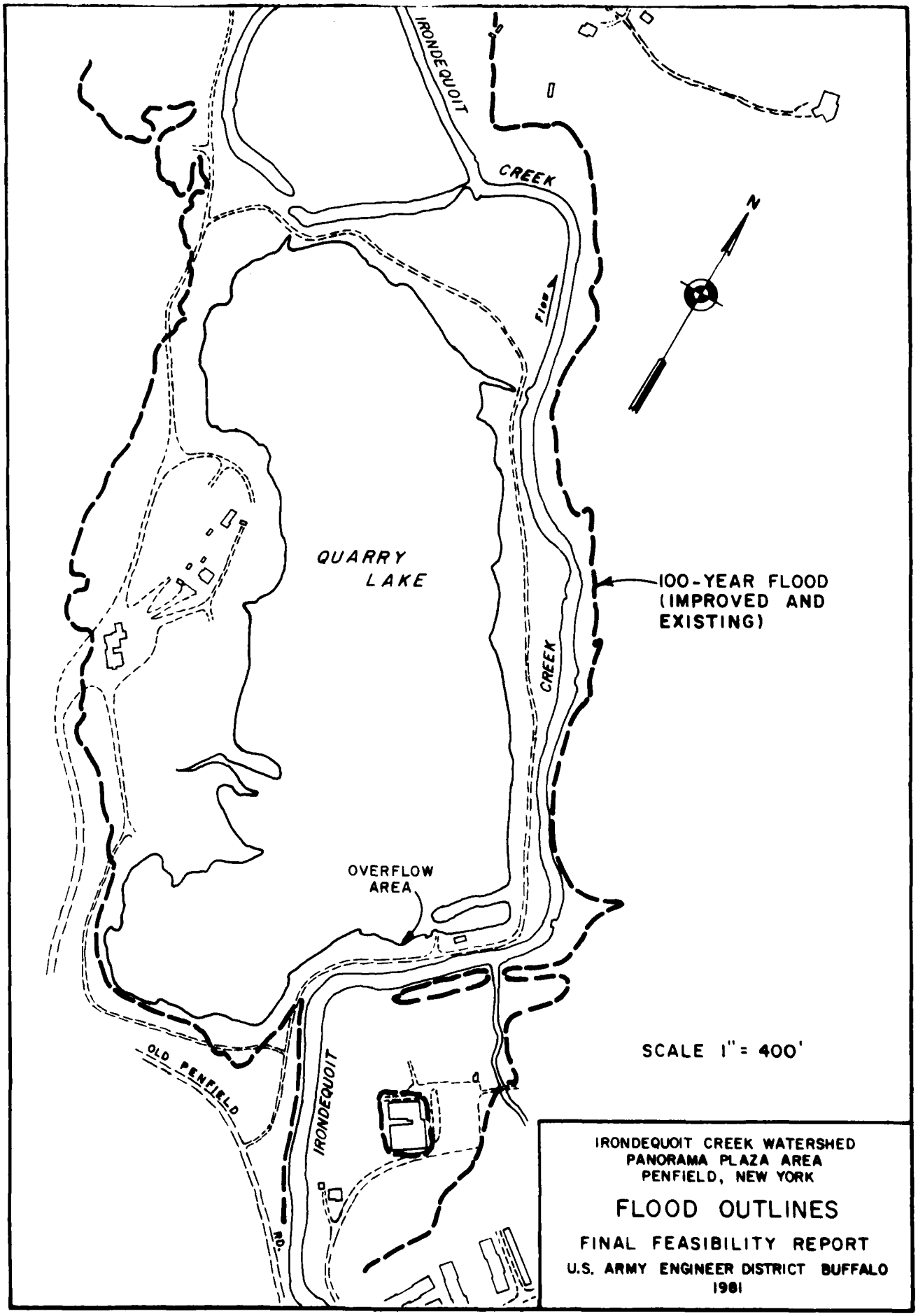
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

FLOOD OUTLINES

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE 1

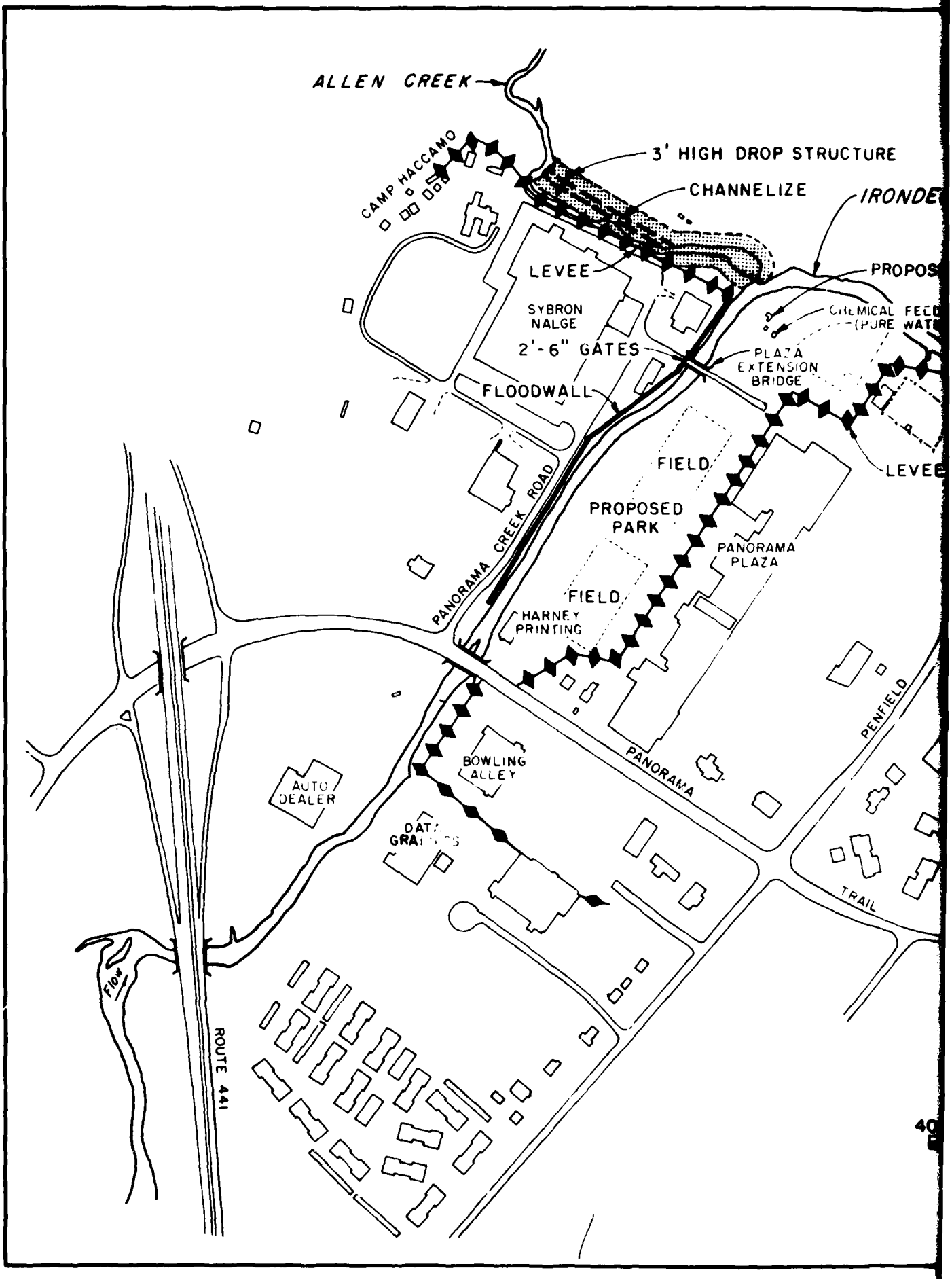


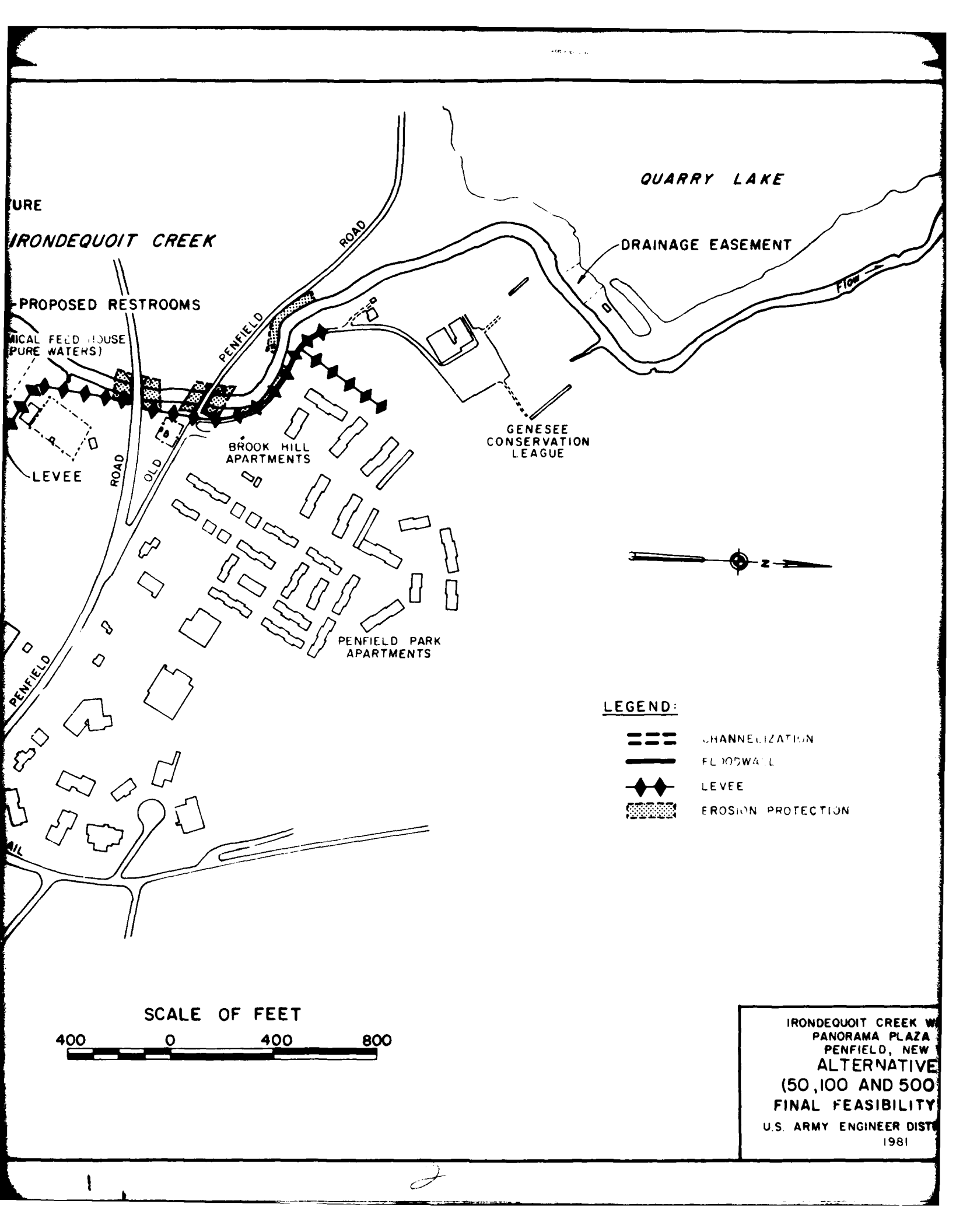
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

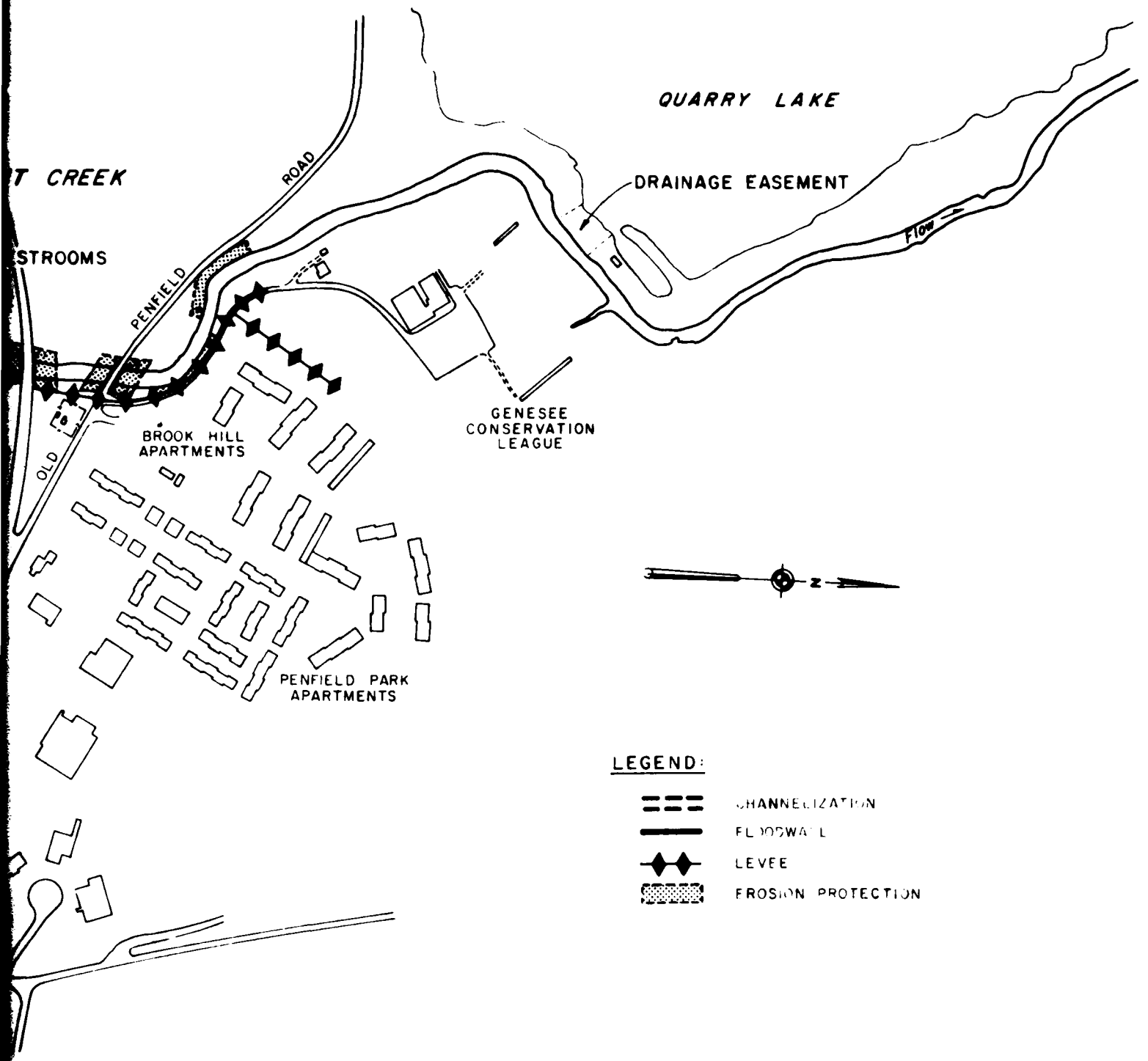
FLOOD OUTLINES

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE 1A


ALLEN CREEK
3' HIGH DROP STRUCTURE
CAMP HACCAMO
CHANNELIZE
IRONDE
LEVEE
PROPOS
SYBRON
NALGE
2'-6" GATES
PLAZA
EXTENSION
BRIDGE
FLOODWALL
LEVEE
FIELD
PROPOSED
PARK
PANORAMA CREEK ROAD
PANORAMA
PLAZA
FIELD
HARNEY
PRINTING
PENFIELD
BOWLING
ALLEY
AUTO
DEALER
PANORAMA
TRAIL
Flow
ROUTE 441


URE
IRONDEQUOIT CREEK
ROAD
QUARRY LAKE
DRAINAGE EASEMENT
Flow
PROPOSED RESTROOMS
MICAL FEED HOUSE
(PURE WATERS)
PENFIELD
LEVEE
ROAD
OLD
BROOK HILL
APARTMENTS
GENESEE
CONSERVATION
LEAGUE
PENFIELD PARK
APARTMENTS
PENFIELD
LEGEND:
CHANNELIZATION
FLOODWALL
LEVEE
EROSION PROTECTION
SCALE OF FEET
400 0 400 800
IRONDEQUOIT CREEK W
PANORAMA PLAZA
PENFIELD, NEW
ALTERNATIVE
(50,100 AND 500
FINAL FEASIBILITY
U.S. ARMY ENGINEER DIST
1981

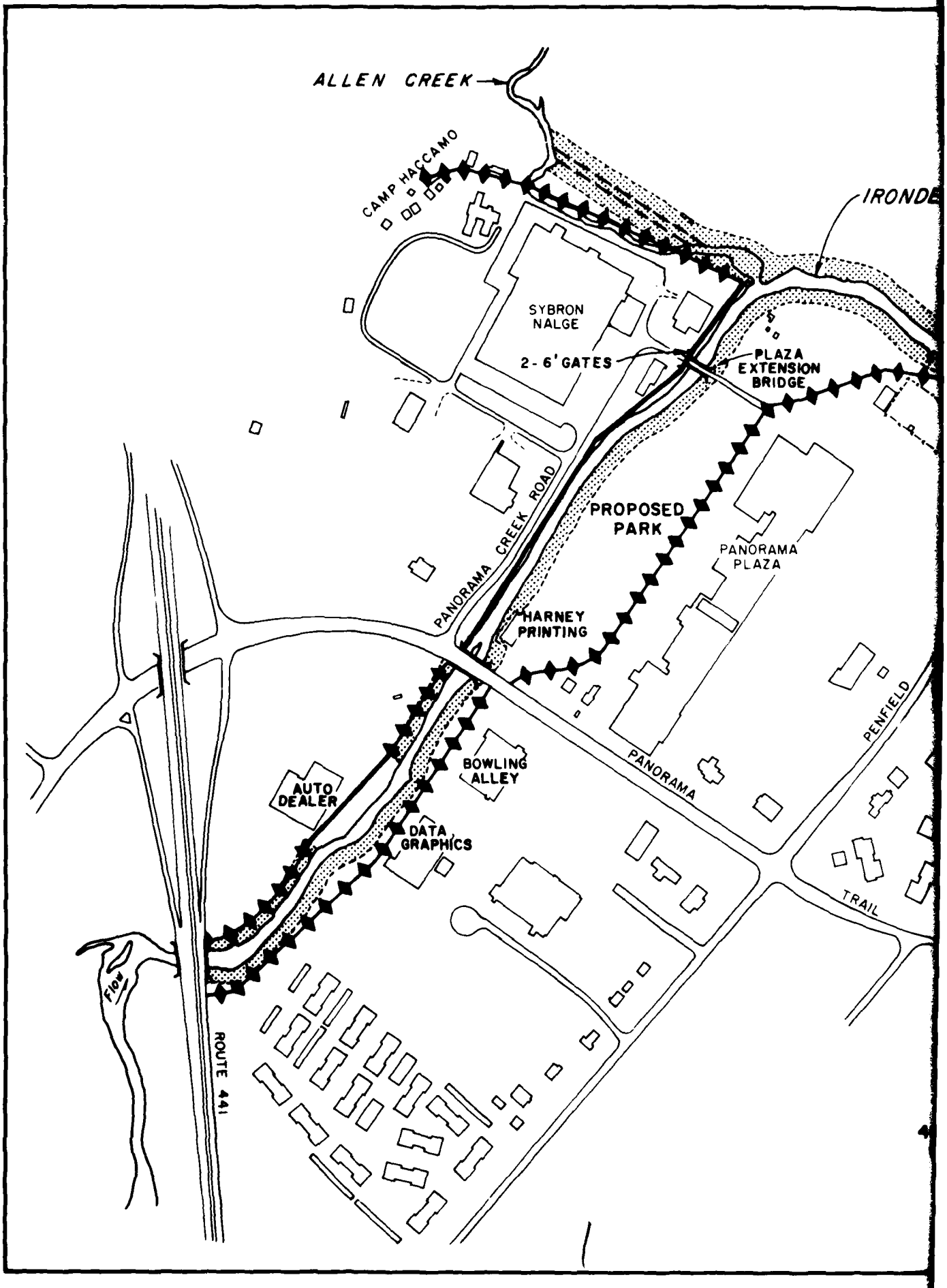


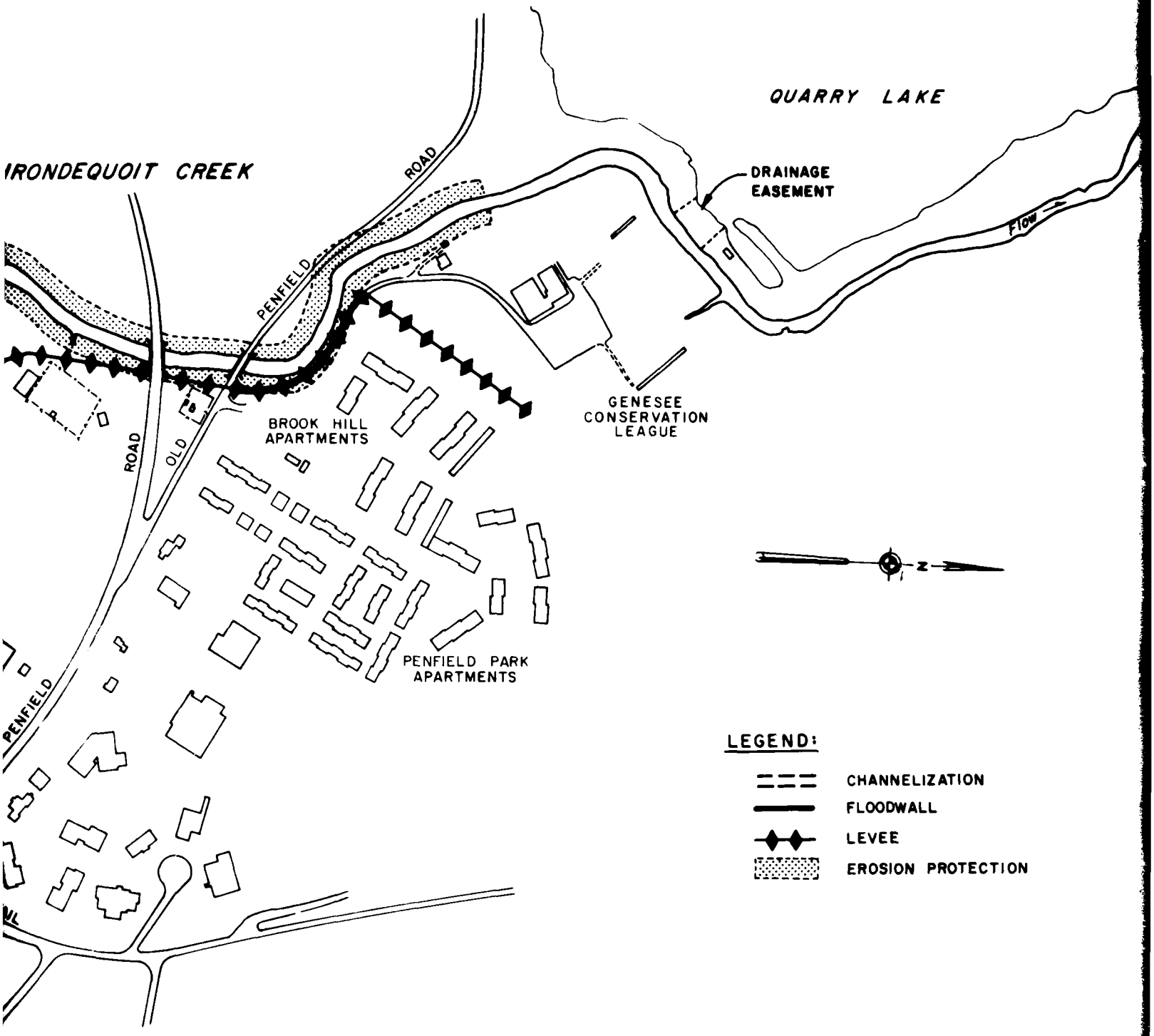
SCALE OF FEET

0 400 800

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
ALTERNATIVE B
(50, 100 AND 500 YEAR)
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE 2

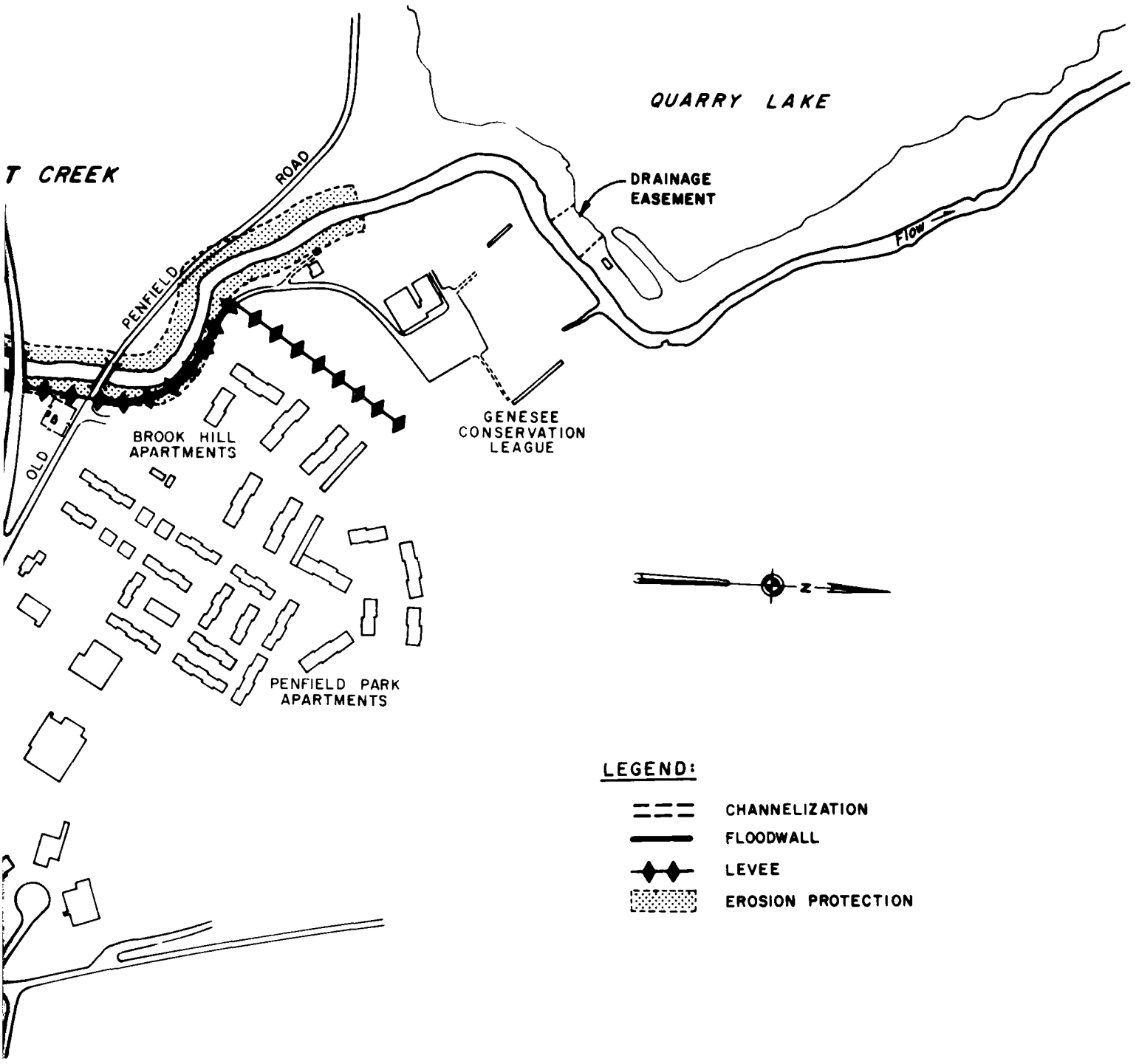

ALLEN CREEK
CAMP HACCAMO
IRONDE
SYBRON NALGE
2-6' GATES
PLAZA EXTENSION BRIDGE
PROPOSED PARK
PANORAMA PLAZA
PANORAMA CREEK ROAD
HARNEY PRINTING
BOWLING ALLEY
AUTO DEALER
DATA GRAPHICS
PANORAMA
PENFIELD
TRAIL
ROUTE 441
Flow



IRONDEQUOIT CREEK WA
PANORAMA PLAZA
PENFIELD, NEW Y

ALTERNATIVE
(STANDARD PROJECT
FINAL FEASIBILITY

U.S. ARMY ENGINEER DISTR
1981



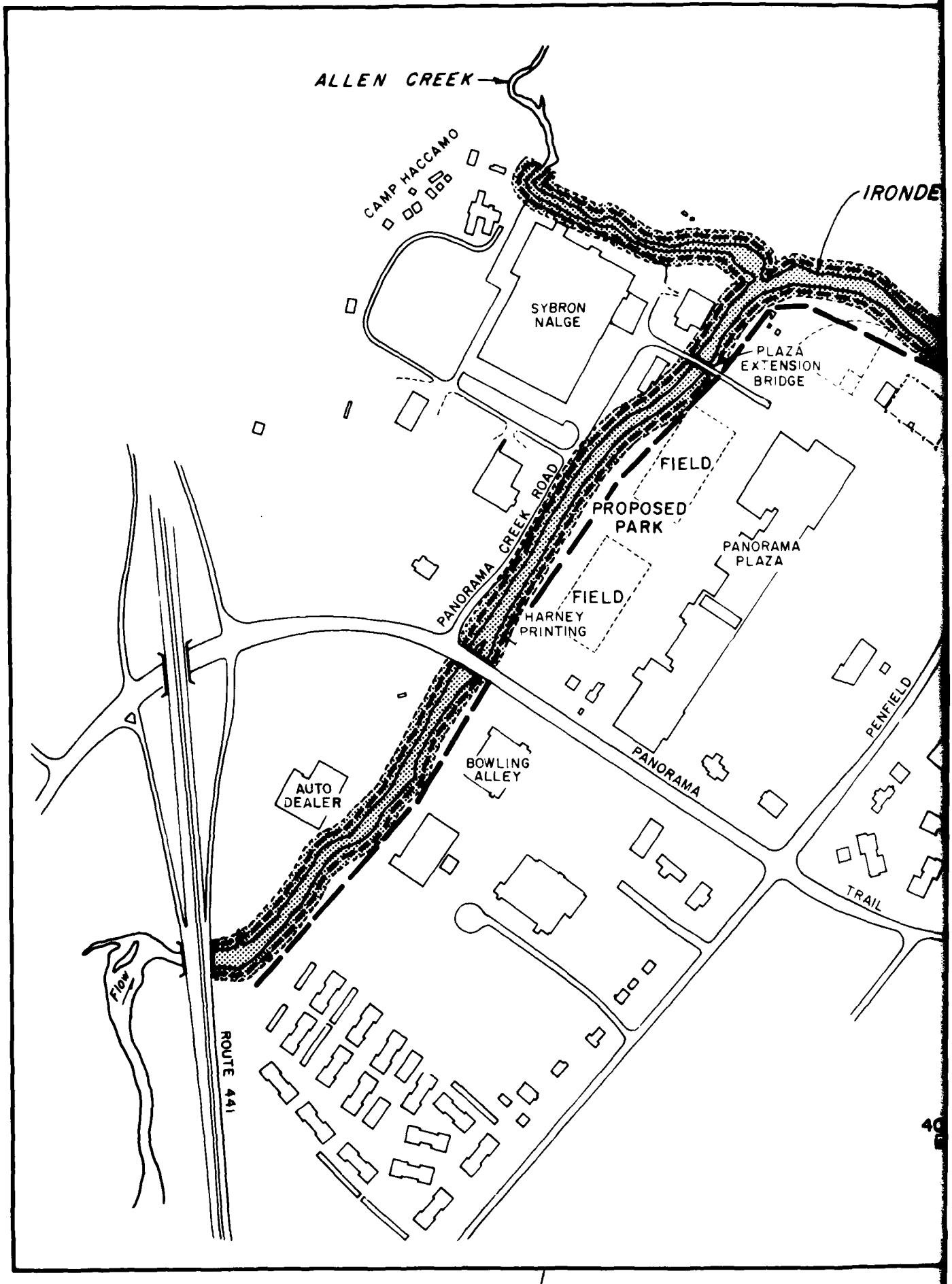
SCALE OF FEET

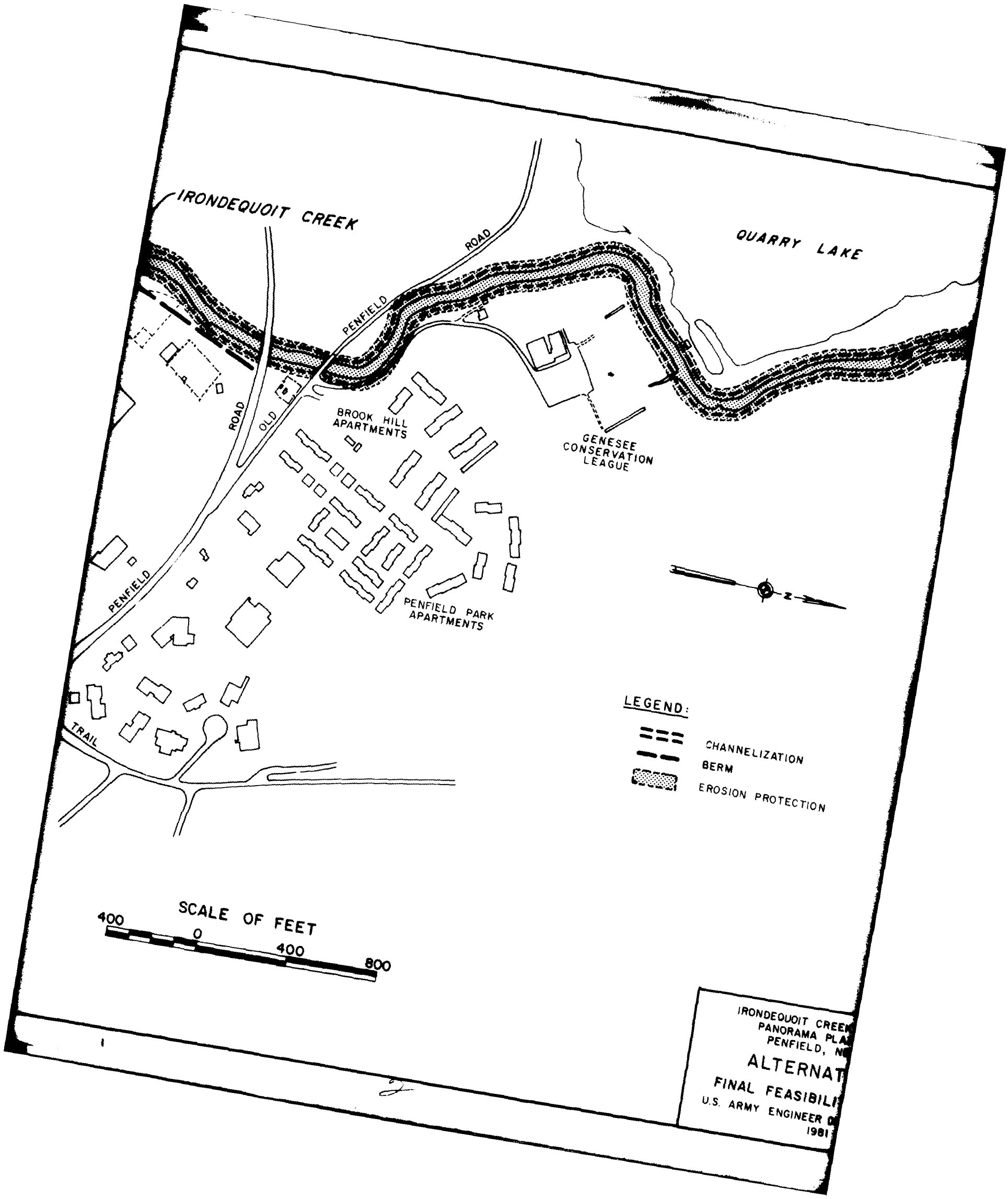
0 400 800

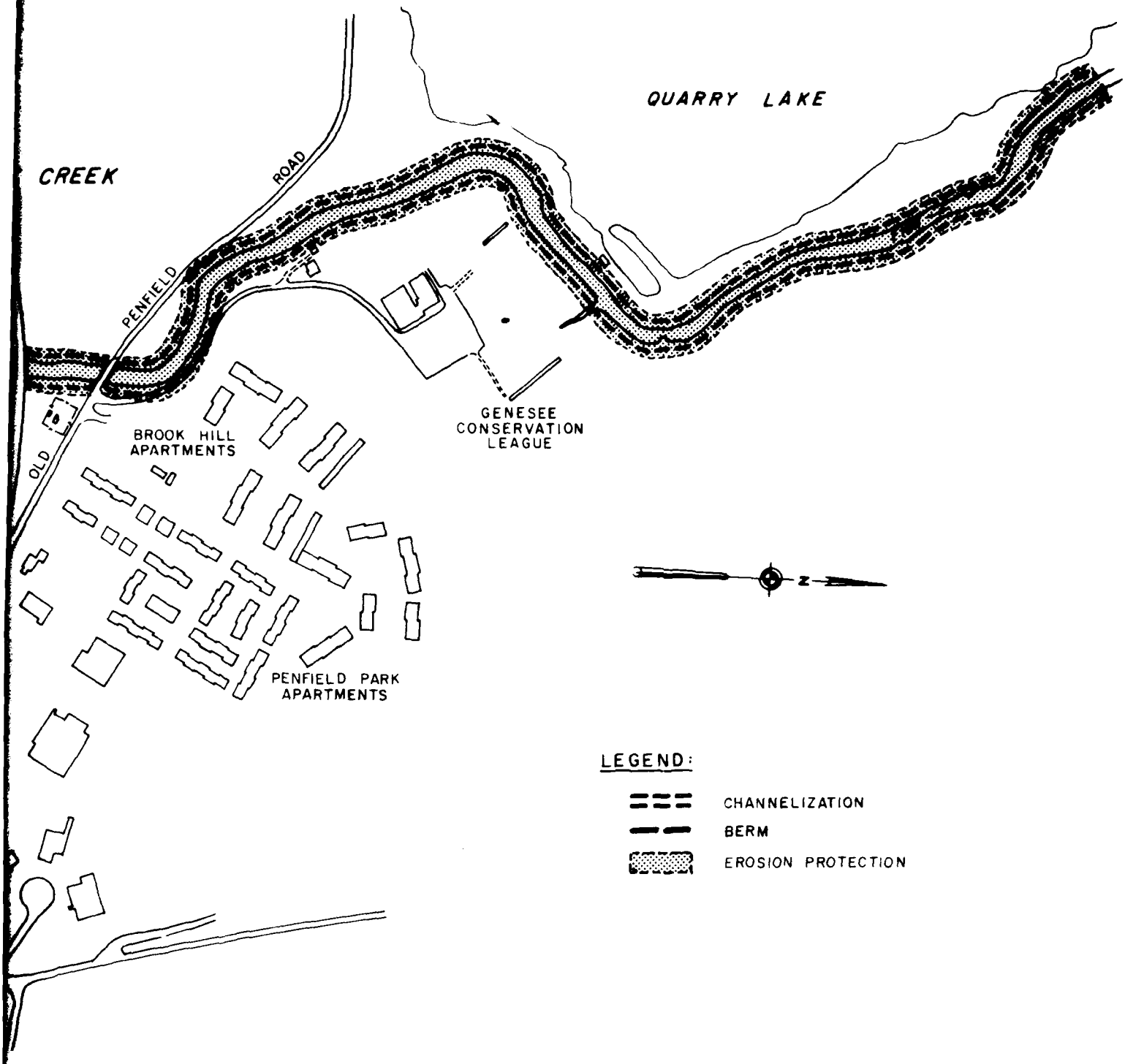
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

ALTERNATIVE B
(STANDARD PROJECT FLOOD)
FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981


ALLEN CREEK
CAMP HACCAMO
IRONDE
SYBRON NALGE
PLAZA EXTENSION BRIDGE
FIELD
PROPOSED PARK
PANORAMA CREEK ROAD
PANORAMA PLAZA
FIELD
HARNEY PRINTING
BOWLING ALLEY
AUTO DEALER
PANORAMA
PENFIELD
TRAIL
Flow
ROUTE 441


IRONDEQUOIT CREEK
ROAD
PENFIELD
QUARRY LAKE
ROAD
OLD
BROOK HILL APARTMENTS
GENESEE CONSERVATION LEAGUE
PENFIELD
PENFIELD PARK APARTMENTS
TRAIL
LEGEND:
CHANNELIZATION
BERM
EROSION PROTECTION
SCALE OF FEET
400
0
400
800
IRONDEQUOIT CREEK
PANORAMA PLA
PENFIELD, N
ALTERNAT
FINAL FEASIBILI
U.S. ARMY ENGINEER D
1981



SCALE OF FEET

0 400 800

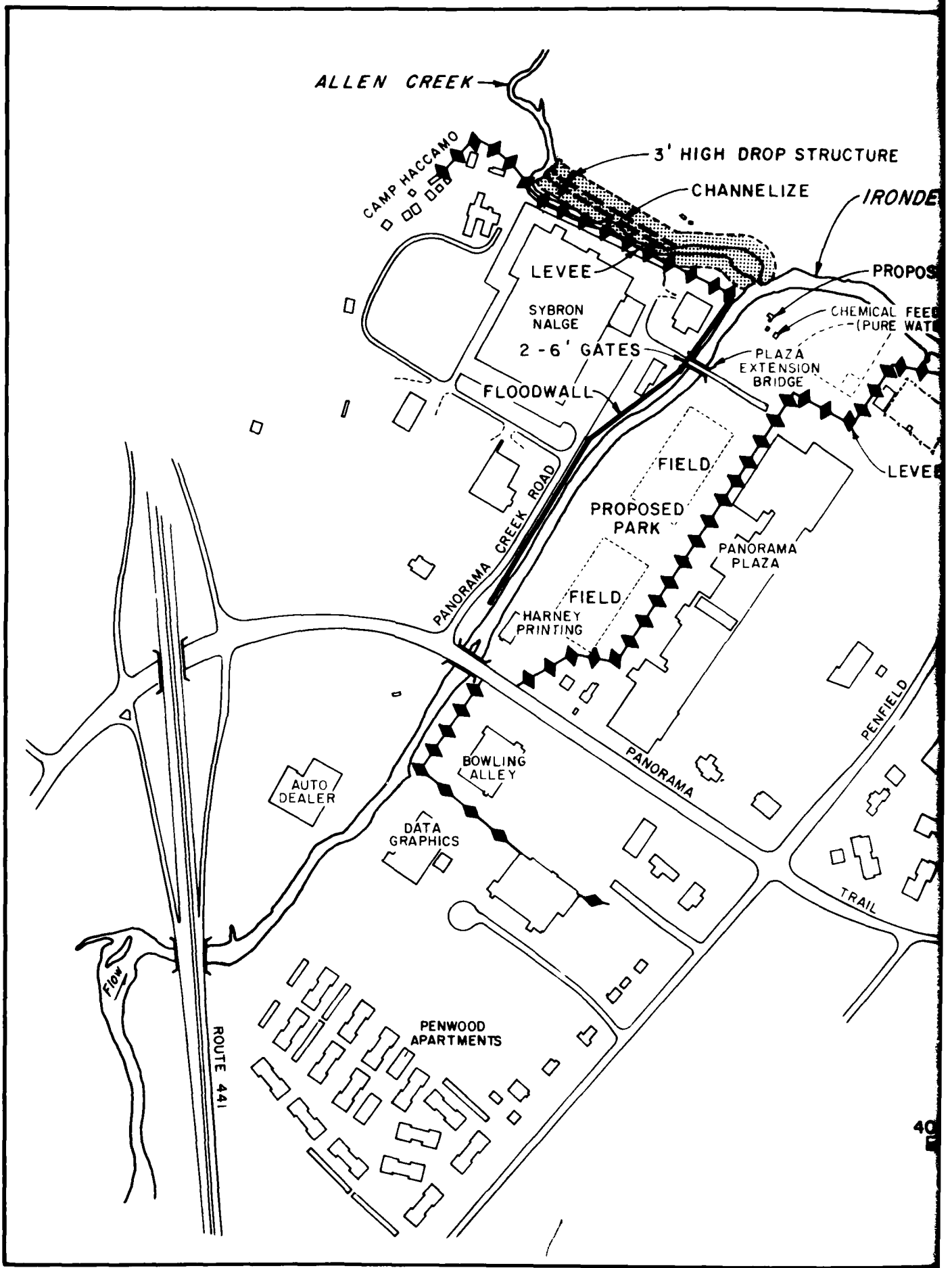
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

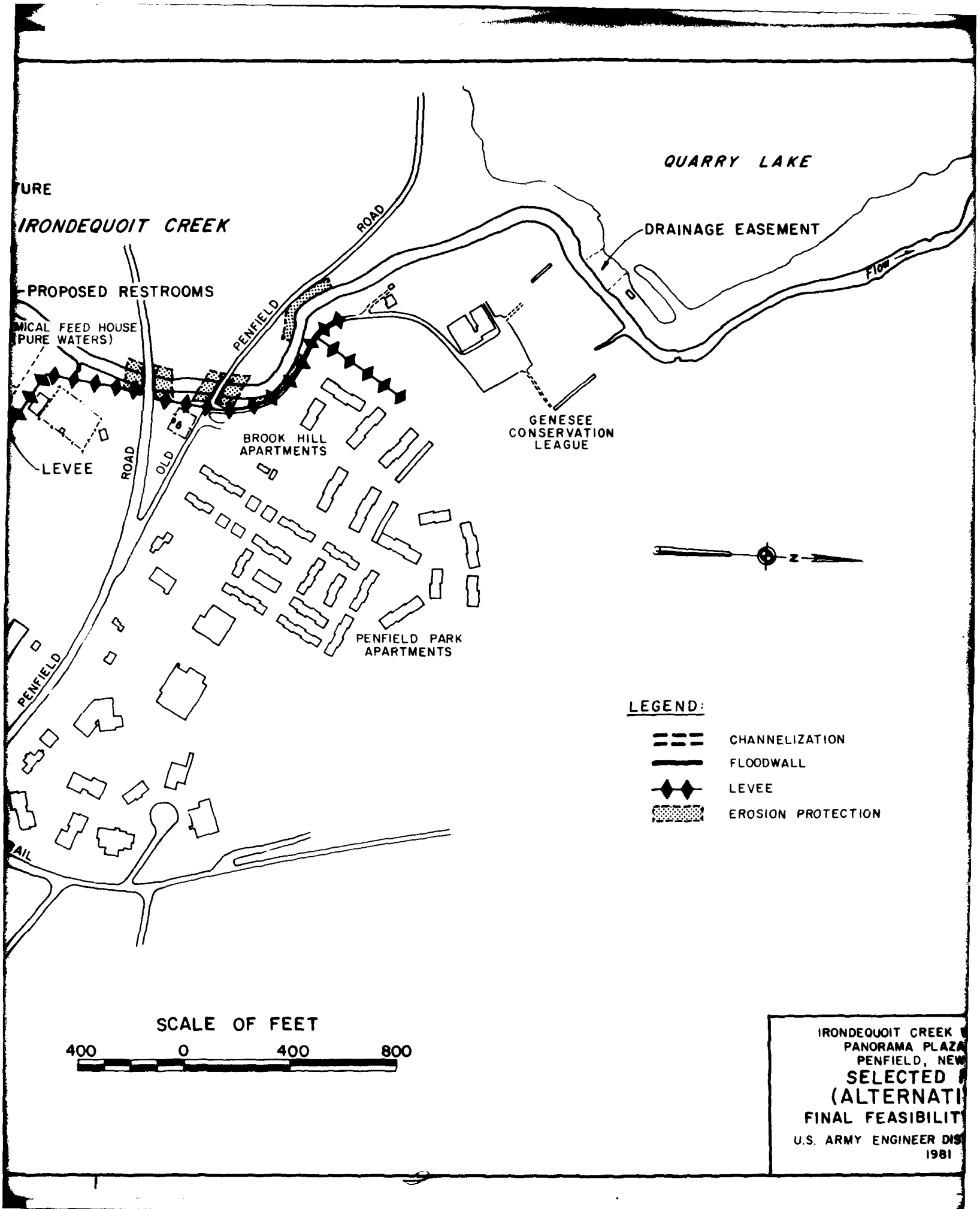
ALTERNATIVE C

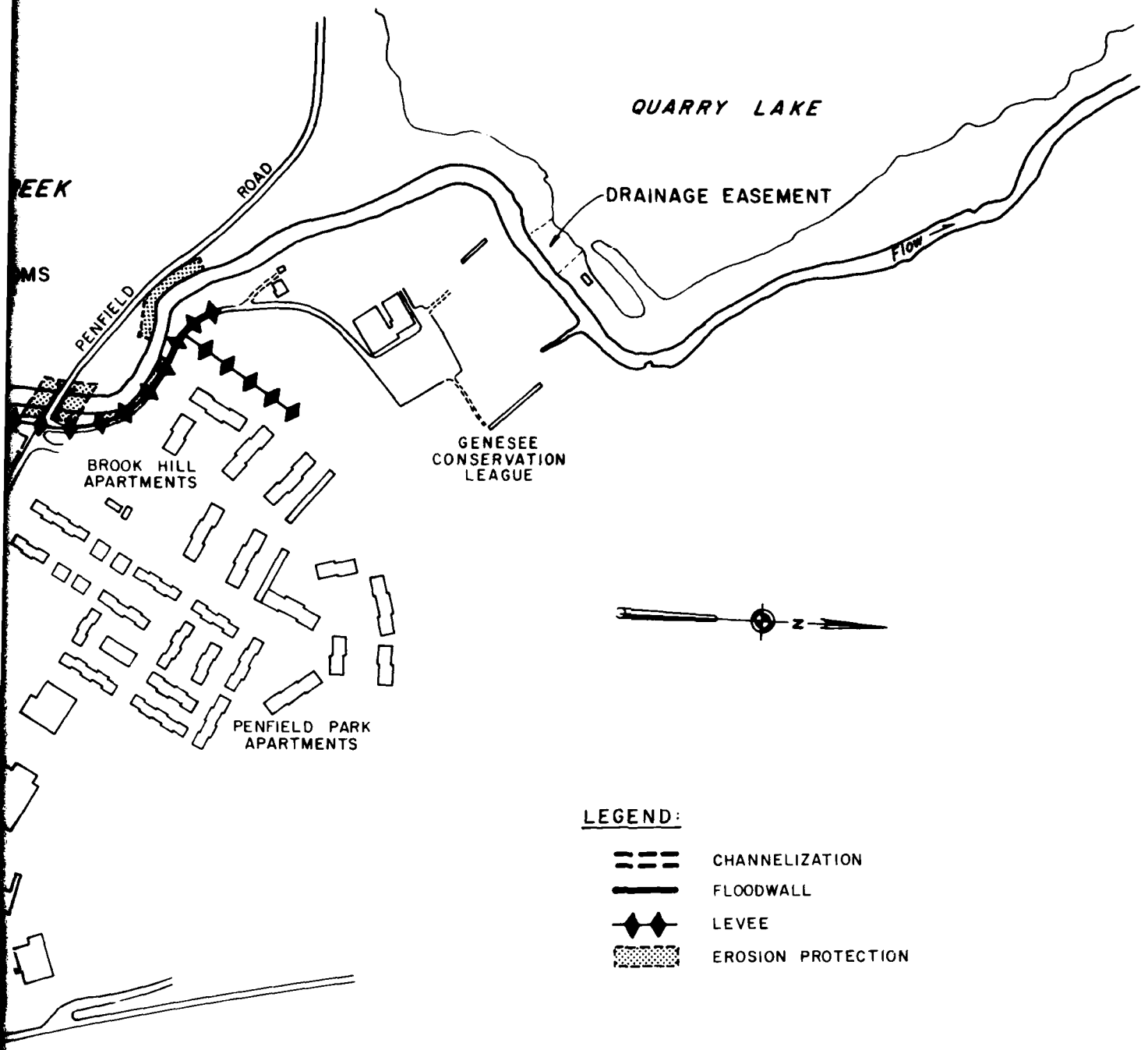
FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE 1


ALLEN CREEK
CAMP HACCAMO
3' HIGH DROP STRUCTURE
CHANNELIZE
IRONDE
PROPOS
LEVEE
SYBRON NALGE
CHEMICAL FEE
(PURE WAT
2 - 6' GATES
PLAZA EXTENSION BRIDGE
FLOODWALL
LEVEE
FIELD
PROPOSED PARK
PANORAMA CREEK ROAD
PANORAMA PLAZA
FIELD
HARNEY PRINTING
PENFIELD
PANORAMA
BOWLING ALLEY
AUTO DEALER
DATA GRAPHICS
TRAIL
Flow
ROUTE 441
PENWOOD APARTMENTS


URE
IRONDEQUOIT CREEK
ROAD
QUARRY LAKE
DRAINAGE EASEMENT
Flow
PROPOSED RESTROOMS
MICAL FEED HOUSE
(PURE WATERS)
PENFIELD
GENESEE
CONSERVATION
LEAGUE
BROOK HILL
APARTMENTS
LEVEE
ROAD
OLD
PENFIELD PARK
APARTMENTS
PENFIELD
AIL
N
LEGEND:
CHANNELIZATION
FLOODWALL
LEVEE
EROSION PROTECTION
SCALE OF FEET
400 0 400 800
IRONDEQUOIT CREEK
PANORAMA PLAZA
PENFIELD, NEW
SELECTED
(ALTERNATI
FINAL FEASIBILIT
U.S. ARMY ENGINEER DIS
1981



LE OF FEET

0 400 800

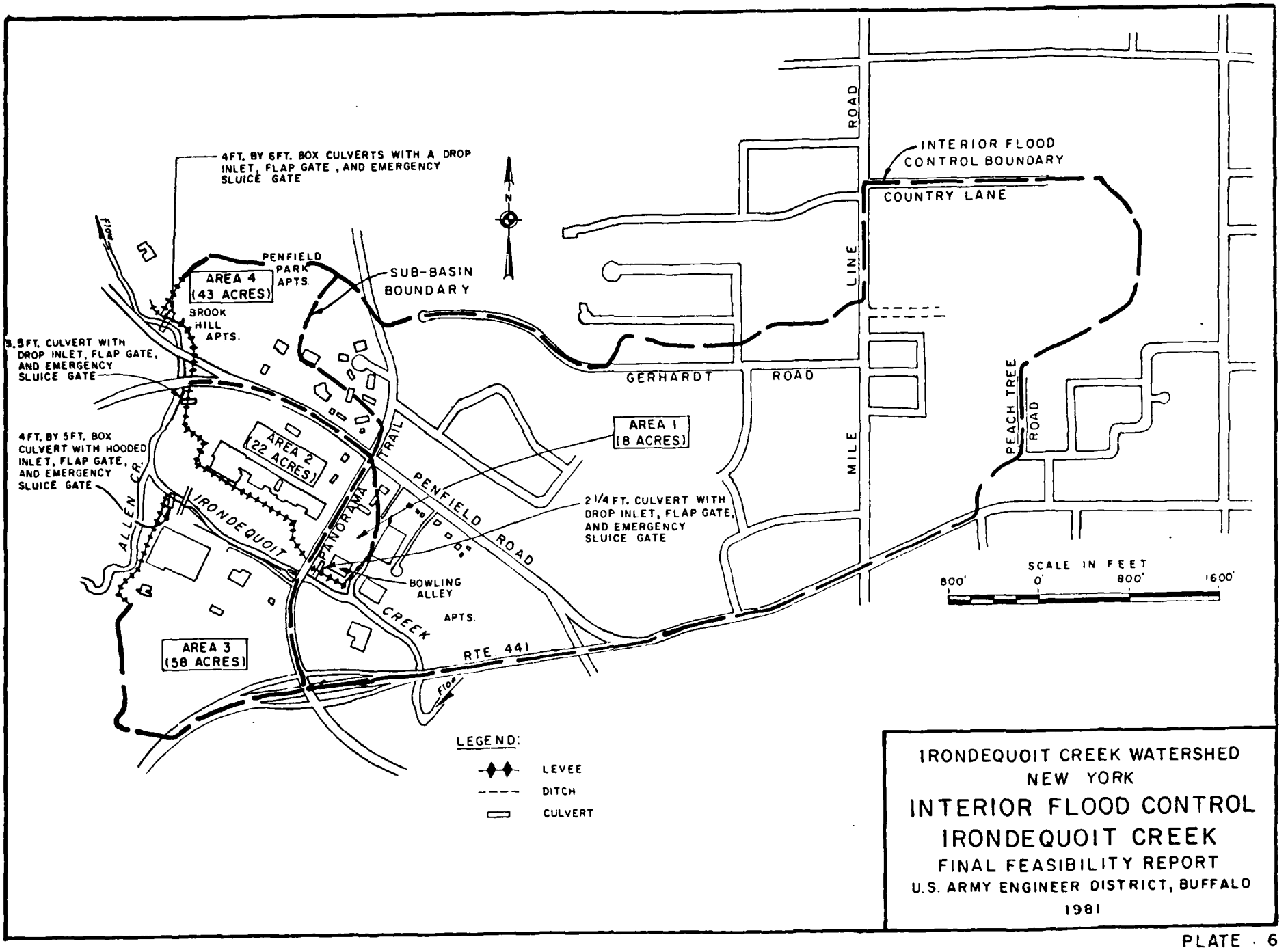
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

SELECTED PLAN (ALTERNATIVE B)

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE 5



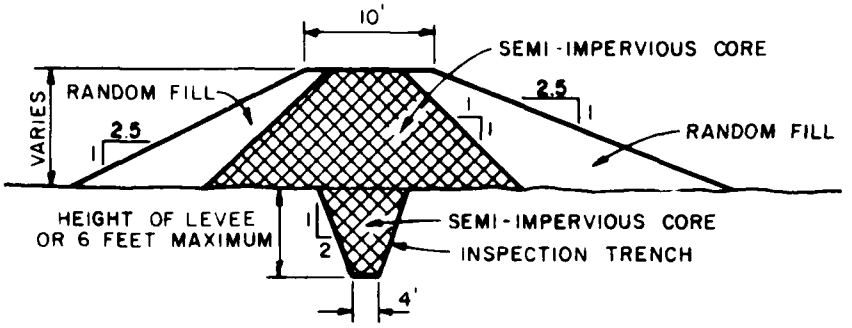
IRONDEQUOIT CREEK WATERSHED
NEW YORK

INTERIOR FLOOD CONTROL IRONDEQUOIT CREEK

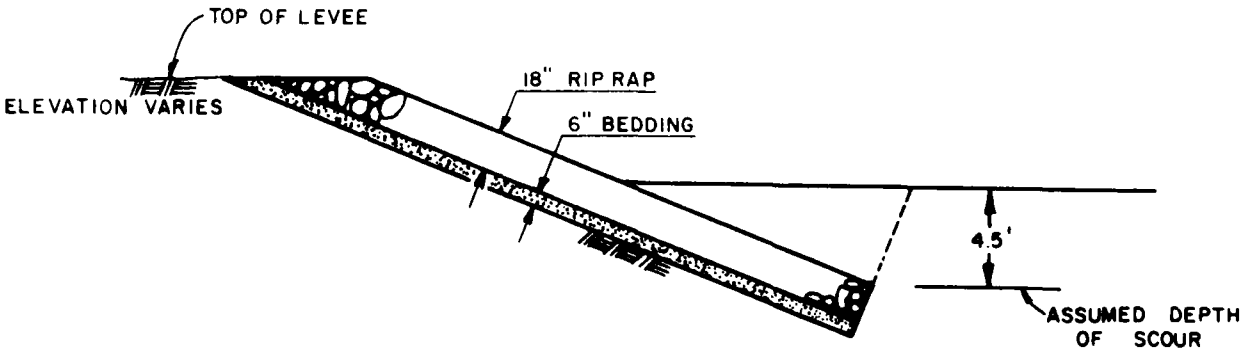
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

PLATE 6

PLATE 6



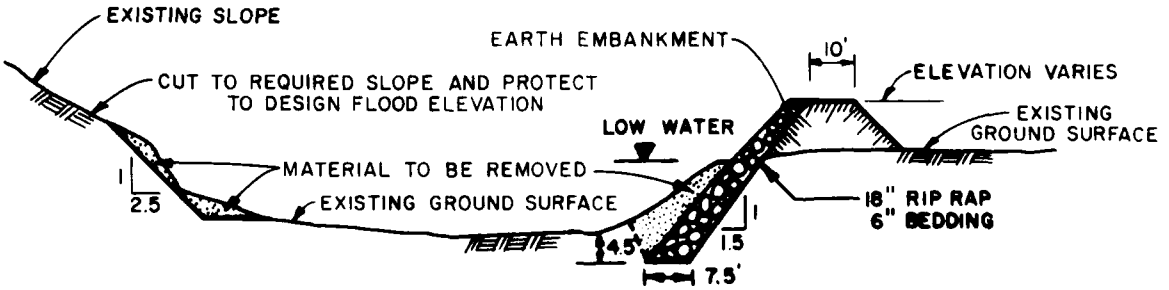
TYPICAL SECTION THROUGH LEVEE



TYPICAL LEVEE SECTION WITH RIP RAP

METHOD A

EM-1110-2-1601, APPENDIX III



TYPICAL SECTION THROUGH CHANNEL WITH LEVEE

METHOD D

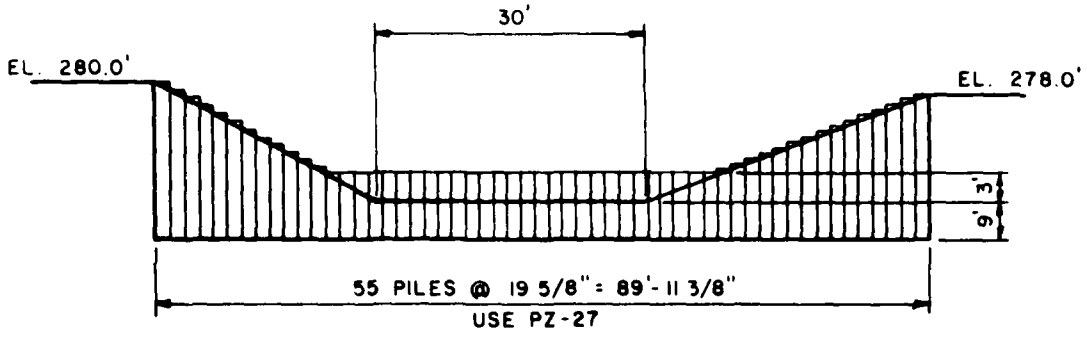
EM-1110-2-1601, APPENDIX III

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

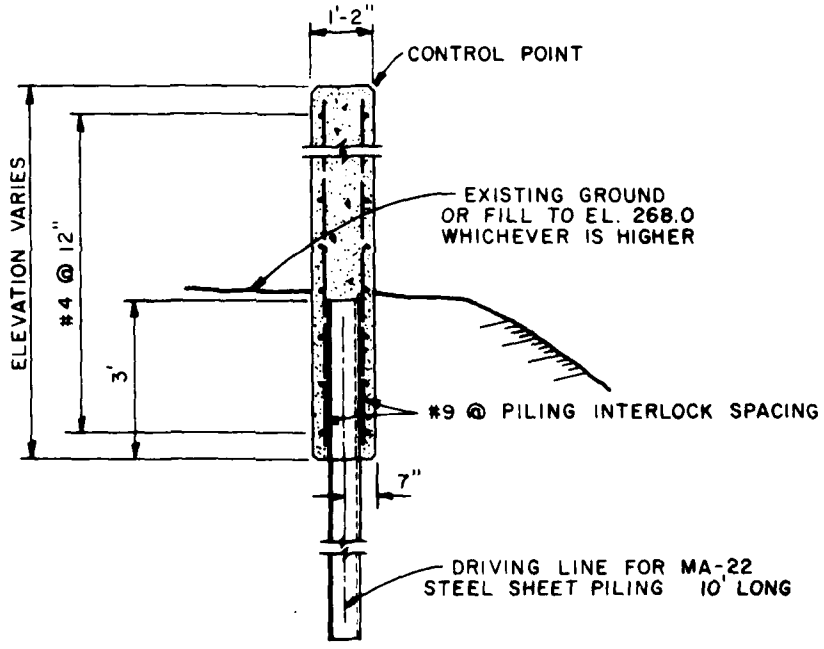
TYPICAL CROSS SECTIONS

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981



3' DROP STRUCTURE @ STA. 8+50 ALLEN CREEK



TYPICAL I-WALL (FLOODWALL)

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

TYPICAL CROSS SECTIONS

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE 8

FINAL
ENVIRONMENTAL IMPACT STATEMENT

Proposed Plan of Flood Protection for the Panorama
Plaza Area in the Irondequoit Creek Watershed
Monroe County, New York

The responsible lead agency is the U.S. Army Engineer District, Buffalo, NY. The responsible cooperating agency is the New York State Department of Environmental Conservation.

Abstract: The Panorama Plaza vicinity is a well-developed area located along the banks of Irondequoit Creek approximately 4 miles south of Irondequoit Bay. The Buffalo District has investigated public concerns of significant flooding problems within the study area. Seven alternatives were initially investigated. Five (Channelization, Diversion Channel, Reservoirs, Channel/Berm, and Nonstructural) were eliminated or partially eliminated in Stage 2 and early Stage 3 planning because of engineering, economic and/or implementation restrictions. Three (No-Action, Nonstructural (Flood Insurance and Flood Plain Management), and Levee/Floodwall)) were considered for more detailed Stage 3 investigation. Alternative A, the No-Action alternative, is always a possibility and must be considered throughout the planning process. Aspects of Alternative G (Flood Insurance and Flood Plain Management) the Nonstructural Alternative, are encouraged and would apply to some degree regardless of the enacted alternative but would not sufficiently satisfy the primary planning objectives. Alternative B - the Levee/Floodwall alternative plan has been identified as the most economically efficient and environmentally sound of the feasible structural alternative which sufficiently satisfies the specific planning objectives. This plan has been selected based on its performance in addressing the identified public concerns and its net positive contribution to the goals of National Economic Development (NED) and Environmental Quality (EQ).

COMMENTS ON THE DRAFT WERE RECEIVED BY:

30 April 1981

If you would like further information on this statement, please contact:

Mr. Tod D. Smith
U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

Commercial Telephone:
(716) 876-5454, Ext. 2171
FTS Telephone:
473-2171

Note: Information, displays, maps, etc. discussed in the Irondequoit Creek Watershed main report are incorporated by reference in the EIS.

LIST OF PREPARERS

The following people are primarily responsible for preparing this Environmental Impact Statement:

Section/Name	Expertise	Experience	Professional Discipline
Planning Branch			
David MacPherson, II	Civil Engineering and Planning	Four years, U. S. Army Engineer District, Buffalo (Project Manager) Three years, Krehbiel Associates (Project Manager)	Civil Engineer
Environmental Section			
James Bennett	Landscape Architecture	Five years, U. S. Army Engineer District, Buffalo (EIS Studies) Fourteen years, Bureau of Indian Affairs Three years, U. S. Forest Service	Community Planner
Leonard Bryniarksi	Natural Resources (Aquatic Biology and Wildlife Management)	Seven years, U. S. Army Engineer District, Buffalo (EIS Studies) Twelve years, U. S. Soil Conservation Service, Soil Conservationist and Wildlife Biologist	Ecologist
Philip Frapwell	Aquatic Biology	Three years, U. S. Army Engineer District, *Buffalo (EIS Studies)*	Biologist
Richard Lewis	Archaeology and History	Three years, U. S. Army Engineer District, Rock Island and Buffalo (Cultural Resources and EIS Studies)	Archaeologist
Tod Smith (EIS Coordinator)	Environmental Planning	Three years, U. S. Army Engineer District, Buffalo (EIS Studies and Drafting Technician)	Community Planner
Kathleen McDermott	Social Sciences	One year, U. S. Army Engineer District, Buffalo (EIS Studies)	Social Scientist
Economics Section			
Ronald Guido	Economics	Nine years, U. S. Army Engineer District, Buffalo (Economic Studies) Two years, Department of Commerce (National Income Accountant)	Economist
John Carr	Economics	One year, U. S. Army Engineer District, Buffalo (Economic Studies)	Economist

SUMMARY

MAJOR CONCLUSIONS AND FINDINGS

To date, the Irondequoit Creek study has determined that there is considerable interest in developing flood protection measures within the watershed and more specifically in the vicinity of Panorama Plaza in the town of Penfield. The plans developed during Stage 3 of the planning process have been evaluated to select those plans which best meet the planning objectives of the study for both economic and environmental desirability. These factors were examined in light of the desires of potential local project cooperators and other agencies, groups, and individuals with expressed desires for the future of the watershed.

Concern for future protection, development, and management of the entire Irondequoit Creek Watershed was evident throughout the study. During Stage 2 investigations, the Buffalo District Corps of Engineers initiated a computerized model study (SAM) for the Irondequoit Watershed area. The main purpose of a SAM-type study is to provide broad long-range information for land use decision makers. This study, however, did not receive the necessary local support for its completion. A brief review of existing flood plain management and flood insurance programs for the towns involved, and a brief institutional analysis to aid in the identification of a central body to coordinate flood plain regulations within the watershed were also conducted. Based on the institutional analysis, an agency under Monroe County jurisdiction appears to be the most feasible entity to act as a central body. Currently, the Pure Waters Agency under the Monroe Department of Public Works, has jurisdiction to coordinate a drainage district for the watershed and is the local sponsor implementing New York State's 208 program (Federal Water Pollution Control Act Amendments of 1972 - Public Law 92-500, Section 208). Although the program primarily concerns improvements to water quality, it also involves land use management which would include drainage management. Therefore, Monroe County's Section 208 program should provide the necessary watershed management coordination in the future, although a number of other agencies/programs exist that could contribute and provide guidance in various aspects of watershed management. See the "Water Quality" section in the main report of the Final Feasibility Report.

Preliminary studies (Stage 1 and 2 investigations) concluded that further Federal studies of flood damage reduction measures for problem areas in the Irondequoit Creek watershed could not be economically justified except in the vicinity of Panorama Plaza. Therefore, the environmental impact analysis in this Final Environmental Impact Statement will pertain primarily to the general vicinity of the Panorama Plaza portion of the watershed.

The Principles and Standards criteria, and directives relative to plan formulation and evaluation require that alternatives be measured to determine their efficiency in meeting the objectives of the plan formulation process. A National Economic Development (NED) Plan and an Environmental Quality (EQ) Plan are identified in the evaluation process. The NED Plan, from a national point of view, represents the best return on the investment of economic resources needed for construction. The EQ Plan, on the other hand,

contributes toward enhancement, preservation, conservation, or improvement to the quality of the natural environment.

Seven alternatives were initially investigated, each providing varying degrees of protection for the Panorama Plaza vicinity. Three (Channelization, Diversion Channel, and Reservoirs) were eliminated in Stage 2 investigations because of engineering, economic, and/or implementation restrictions. Two (Channel/Berm and Nonstructural) were eliminated or partially eliminated in early Stage 3 investigations for similar previously mentioned reasons. Three (No-Action, Nonstructural (Flood Insurance and Flood Plain Management), and Levee/Floodwall)) were considered for more detailed Stage 3 investigation.

Alternative A, the no-action alternative, is always a possibility, even though it would not sufficiently satisfy any of the primary planning objectives. It is a nonstructural alternative and must be carried forward through the planning process.

Alternative G, nonstructural alternative, was studied further in early Stage 3 investigations. Although these measures alone failed to sufficiently satisfy the primary planning objectives, certain aspects of these measures would contribute to other more feasible alternatives and/or would be incorporated regardless of the enacted alternative. For this reason, the Flood Insurance and Flood Plain Management aspects of this alternative were studied further as nonstructural measures in Stage 3 investigations.

Alternative C, the Channel/Berm alternative, was studied further in early Stage 3 investigations, since Stage 2 investigations indicated that it would provide the greatest economic efficiency and was preliminarily identified as the NED Plan. However, subsequent soils investigations determined that extensive erosion protection measures would be required to implement the alternative. This significantly increased the estimated cost of construction, thereby eliminating Alternative C as the (NED) Plan. Alternative C was also identified as having significant adverse environmental effects, primarily because of its devastating impacts to aquatic and riparian natural environments. It was therefore eliminated early in Stage 3 planning and was not considered for further detailed investigation.

Alternative B, the Levee/Floodwall alternative, was initially identified as the least environmentally damaging (EQ) feasible structural alternative and has improved in this respect by incorporating mitigating measures as a result of coordination with various environmental and planning groups. This alternative has now also been identified as the (NED) plan for reasons previously stated.

Alternative B has been selected for the Panorama Plaza vicinity based on its performance in addressing the identified public concerns and its net positive contribution to the goals of National Economic Development (NED) and Environmental Quality (EQ).

One aspect of Alternative B requires that a portion of the reach along Allen Creek be channelized. As such, a portion of the existing creek bed will be

filled and a new channel bed created a short distance away. The required Section 404 report has been prepared and may be reviewed in Appendix H of the main report of the Final Feasibility Report.

AREAS OF CONTROVERSY AND UNRESOLVED ISSUES

Several controversies had developed as the study progressed. In Stage 2 studies, a primary concern revolved around present and future watershed development and management policies. Towns and communities downstream feel that indiscriminate development projects upstream increasingly contribute to their problems, and feel that a watershed management program is necessary. As stated in the previous section, the Buffalo District Corps of Engineers conducted several investigations relative to the development of watershed management practice and coordination. An institutional analysis was conducted and a land use impact projection computer program was investigated but was subsequently dropped from further study because only three of the seven towns involved responded favorably. The Corps identified the Monroe County agency responsible for implementing New York State's 208 program as a likely entity to act as a central body for future coordination - although a number of other agencies/programs exist that could contribute and provide guidance in various aspects of watershed management.

Most interested parties agreed that a flood damage reduction measure would be beneficial to the developments in the Panorama Plaza vicinity. The protection methods that should be implemented however did fall under some controversy. Initial investigation indicated that Alternative C - Channel/Berm would be most economially efficient, but most environmentally damaging. This created some conflict between those parties with primarily environmental interests and those seeking the most cost efficient solution. Subsequent investigation of alternatives however (as stated previously) identified Alternative B - Levee/Floodwall as the most economically efficient and least environmentally damaging plan. This, and continuing the planning process with continued incorporation of mitigation measures, has greatly resolved the controversy.

Complete detailed mitigation and/or compensation measures for adverse effects resulting from implementation of alternative plans have not been totally resolved. Structural alternatives would induce some adverse environmental effects, would require limited access to the plaza extension bridge and the Old Penfield Road bridge, and would require the relocation of the Harney Print Shop. Detailed and additional mitigation and compensation measures will be finalized with completion of the detailed plans and specifications.

Although the distribution of Federal and non-Federal costs for the project is fairly well-established, the distribution of local shares is being determined by the NYSDEC. Many feel that those entities that are protected should bear the greatest share, while others feel that developing areas within the watershed contribute to increased flooding problems and that they should pay their fair share. Resolution of this issue is primarily the responsibility of the local sponsoring agency, in this case, the New York State Department of Environmental Conservation.

RELATIONSHIP TO ENVIRONMENTAL REQUIREMENTS

The Stage 3 detailed plans have been considered in relationship to a number of Federal, State, and local laws and policies. Table 0 lists these laws and policies and the compliance relationship of the considered Stage 3 detailed alternatives to them.

Table 0 - Relationship of Plans to Environmental Requirements Protection Statutes and Other Environmental Requirements

Federal Statutes	Alternative A No-Action	Alternative C Nonstructural	Alternative B Levee/Floodwall
Archeological and Historic Preservation Act, as amended, 16 USC 469 et. seq.	N/A	N/A	N/A
Clean Air Act, as amended, 42 USC 7401, et. seq.	N/A	N/A	Full
Clean Water Act, as amended (Federal Water Pollution Control Act), 33 USC 1251 et. seq.	N/A	N/A	Full
Coastal Zone Management Act, as amended, 16 USC 1451, et. seq.	N/A	N/A	N/A
Endangered Species Act, as amended, 16 USC 1531 et. seq.	N/A	N/A	Full
Estuary Protection Act, 16 USC 1221, et. seq.	N/A	N/A	N/A
Federal Water Project Recreation Act, as amended, 16 USC 460-1(12), et. seq.	Full	Full	Full
Fish and Wildlife Coordination Act, as amended, USC 661, et. seq.	Full	Full	Full
Land and Water Conservation Fund Act, as amended, 16 USC 4601-4601-11 et. seq.	N/A	N/A	Full
Marine Protection, Research and Sanctuaries Act, 22 USC 1401 et. seq.	N/A	N/A	N/A
National Historic Preservation Act, as amended, 16 USC 470a, et. seq.	Full	Full	Full
National Environment Policy Act, as amended, 42 USC 4321, et. seq.	Full	Full	Full
Rivers and Harbors Act, 33 USC 401 et. seq.	N/A	N/A	N/A
Watershed Protection and Flood Prevention Act, 16 USC 1001, et. seq.	N/A	N/A	N/A
Wild and Scenic Rivers Act, as amended, 16 USC 1271, et. seq.	N/A	N/A	N/A
Executive Orders, Memoranda			
Floodplain Management (EO 11988)	Full	Full	Full
Protection of Wetlands (EO 11990)	N/A	N/A	Full
Environmental Effects Abroad of Major Federal Actions (EO 12114)	N/A	N/A	N/A
Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, 30 Aug 76)	N/A	N/A	Full
New York State Freshwater Wetlands Act (Wetlands >12.4 acres)	N/A	N/A	Full
Environmental Conservation Law - Article 15 (Protection of Water)	N/A	N/A	Full
Local Land Use Plans (See Floodplain Management EO 11988, also)	Full	Full	Full

The compliance categories used in this table were assigned based on the following definitions:

a. Full compliance - All requirements of the statute, EO, or other policy and related regulations have been met.

b. Partial compliance - Some requirements of the statute, EO, or other policy and related regulations remain to be met.

c. Noncompliance - None of the requirements of the statute, EO, or other policy and related regulations have been met.

d. Not Applicable - N/A statute, EO, or other policy not applicable.

PROPOSED PLANS FOR FLOOD DAMAGE REDUCTION MEASURES IN THE PANORAMA PLAZA VICINITY OF THE IRONDEQUOIT CREEK WATERSHED, TOWN OF PENFIELD, MONROE COUNTY, NEW YORK

FINAL ENVIRONMENTAL IMPACT STATEMENT

TABLE OF CONTENTS

Paragraph	Subject	Page
	SECTION 1	
	NEED FOR AND OBJECTIVES OF THE ACTION	
	STUDY AUTHORITY	EIS-11
	PUBLIC CONCERNS	EIS-11
1.04	General	EIS-11
1.05	Flooding	EIS-11
1.06	Future Flooding	EIS-12
1.07	Obstructions	EIS-12
1.08	Stream Erosion	EIS-12
1.09	Socioeconomic	EIS-12
1.10	Future Development and Watershed Management	EIS-12
1.11	Sources of Funding and Local Assurances	EIS-13
1.12	Property Needs	EIS-13
1.13	Social Well-Being	EIS-13
1.14	Disruption and Relocation of Facilities	EIS-13
1.15	Recreation	EIS-13
1.16	Aesthetics	EIS-13
1.17	Environmental Quality	EIS-13
1.18	Water Quality	EIS-13
1.19	Impacts of Channelization and Disposal of Dredged Material	EIS-14
1.20	Natural Resources	EIS-14
	PLANNING OBJECTIVES	EIS-14
1.22	The Two National Objectives	EIS-14
	a. National Economic Development (NED)	EIS-14
	b. Environmental Quality (EQ)	EIS-14
	SECTION 2	
	ALTERNATIVES	
	ALTERNATIVES ELIMINATED FROM FURTHER STUDY EARLY IN STAGE 3 INVESTIGATIONS	EIS-16
2.01	General	EIS-16
2.02	Alternative C - Channel/Berm	EIS-16
2.05	Alternative G - Nonstructural	EIS-16

TABLE OF CONTENTS (Cont'd)

Paragraph	Subject	Page
2.06	Flood Warning System	EIS-17
2.07	Floodproofing	EIS-17
2.08	Permanent Evacuation	EIS-17
2.09	Flood Plain Regulations	EIS-17
2.10	Flood Insurance	EIS-17
	WITHOUT CONDITIONS (NO-ACTION)	EIS-17
2.12	Without Conditions - General	EIS-18
2.17	Without Conditions - No-Action	EIS-19
	PLANS CONSIDERED IN DETAIL	EIS-20
2.21	General	EIS-20
2.22	Alternative A - No-Action Plan	EIS-20
2.23	Alternative Plan G - Nonstructural (Flood Insurance and Flood Plain Management)	EIS-20
2.27	Alternative B - Levee/Floodwall	EIS-21
	THE NED AND EQ PLANS	EIS-22
2.32	The Principles and Standards for Planning Water and Related Land Resources	EIS-22
2.33	The NED Plan	EIS-22
2.34	The EQ Plan	EIS-22
	THE PREFERRED PLAN	EIS-23
	COMPARATIVE IMPACTS (EFFECTS) OF ALTERNATIVES	EIS-23
2.36	Table A - Environmental Effects - Summary Matrix	EIS-23
2.37	Table B - Comparative Impacts of Items of Significant Concern	EIS-23
	SECTION 3	
	AFFECTED ENVIRONMENT	
	INTRODUCTION	EIS-28
	ENVIRONMENTAL CONDITIONS	EIS-28
	SIGNIFICANT RESOURCES	EIS-30
3.13	Unaffected Section 122 Guidelines Parameters	EIS-30
3.14	Affected Section 122 Guidelines Parameters	EIS-30

TABLE OF CONTENTS (Cont'd)

Paragraph	Subject	Page
	SECTION 4	
	ENVIRONMENTAL EFFECTS	
4.01	Introduction	EIS-32
	EFFECTS ON THE NATURAL ENVIRONMENT	EIS-32
4.02	Topography	EIS-32
4.03	Man-Made Resources	EIS-33
4.04	Air Quality	EIS-33
4.05	Water Quality	EIS-33
4.06	Wetlands	EIS-33
4.07	Benthos	EIS-33
4.08	Fishery	EIS-34
4.09	Vegetation	EIS-35
4.10	Wildlife	EIS-36
4.11	Threatened and Endangered Species	EIS-36
	EFFECTS ON THE HUMAN ENVIRONMENT	EIS-36
4.13	Man-Made Resources	EIS-36
4.14	Flood Protection	EIS-37
4.15	Cultural Resources	EIS-37
4.16	Noise	EIS-37
4.17	Aesthetic Values	EIS-37
4.18	Population (Density and Mobility)	EIS-38
4.19	Displacement or Acquisition	EIS-39
4.20	Community Cohesion	EIS-40
4.21	Desirable Community Growth	EIS-40
4.22	Institutional Relationships	EIS-41
4.23	Health and Safety	EIS-41
4.24	Leisure Opportunities (Recreation)	EIS-42
4.25	Land Use	EIS-42
4.26	Facilities and Services	EIS-43
4.27	Transportation	EIS-44
4.28	Property Values and Tax Revenues	EIS-44
4.29	Desirable Regional Growth	EIS-44
4.30	Employment and Labor Force	EIS-45
4.31	Business and Industrial Activity	EIS-45
4.32	Displacement of Farms	EIS-45
	ADDITIONAL ITEMS OF CONCERN	EIS-46
4.33	Plan Economics	EIS-46
4.35	Genesee Conservation Club	EIS-46
4.36	Quarry Lake	EIS-47
4.37	Ellison Park, Downstream Wetlands, Irondequoit Bay	EIS-47

TABLE OF CONTENTS (Cont'd)

Paragraph	Subject	Page
	SECTION 5	
	PUBLIC INVOLVEMENT	
	PUBLIC INVOLVEMENT PROGRAM	EIS-47
	REQUIRED COORDINATION	EIS-48
5.07	Coordination with Fish and Wildlife Agencies	EIS-48
5.10	Compliance with Executive Order 11990, Protection of Wetlands, 24 May 1977	EIS-48
5.11	Compliance with Executive Order 11988, Flood Plain Management, 24 May 1977	EIS-49 EIS-49
5.12	Analysis of Impacts on Prime and Unique Farmlands, CEQ Memorandum, 30 August 1976	EIS-49
5.13	Compliance with the Clean Water Act of 1977, 33 USC 1251 et. seq.	EIS-49
5.14	Cultural Resources	EIS-49
	PUBLIC VIEWS (Prior to Release of the DFFR and DEIS)	EIS-50
5.16	Views of Other Federal Agencies	EIS-50
5.18	Views of Non-Federal Interests	EIS-50
	STATEMENT RECIPIENTS	EIS-51
	Federal	EIS-51
	State	EIS-51
	Legislature	EIS-51
	Others	EIS-51
	REVIEW OF THE DRAFT FFR AND DEIS	EIS-52
5.23	Filing of the DEIS	EIS-52
5.24	Public Meeting	EIS-52
5.25	Public Views Since Release of the Draft Final Feasibility Report and Draft Environmental Impact Statement	EIS-52
	REFERENCES	EIS-53
	INDEX	EIS-54

SECTION 1

NEED FOR AND OBJECTIVES OF THE ACTION

STUDY AUTHORITY

1.01 Irondequoit Creek has had a recorded history of flooding for more than a hundred years. Continued urbanization and encroachment into the flood plain has increased flood damage costs in recent years. These problems and concerns have resulted in legislation aimed at investigation and resolution of these problems.

1.02 Congressman Frank J. Horton, 34th New York District, sponsored a resolution through the House of Representatives, Committee on Public Works, authorizing a survey on Irondequoit Creek, NY, and tributaries, including Allen Creek. The authorization is contained in Section 208 of the Flood Control Act of 1965 (Public Law 89-298) adopted 27 October 1965. The resolution reads:

> "The Secretary of the Army is hereby authorized and directed to cause surveys for flood control and allied purposes, including channel and major drainage improvements, and floods aggravated by or due to wind or tidal effects, to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its territorial possessions, which include the localities specifically named in this section. After the regular or formal reports made on any survey authorized by this section are submitted to Congress, no supplemental or additional report or estimate shall be made unless authorized by law except that the Secretary of the Army may cause a review of any examination or survey to be made and a report thereon submitted to Congress, if such review is required by the national defense or by changed physical or economic conditions."

1.03 The study area lies mainly in the 34th District of New York, represented by Congressman Frank J. Horton, and a small portion within Districts 33 and 35 represented by Congressman Gary A. Lee and Barber B. Conable, Jr., respectively.

PUBLIC CONCERNS

1.04 General - Throughout the course of the Irondequoit Creek Study, numerous concerns, problems, and needs have been expressed by individuals, governmental agencies, and other interested parties. These concerns were identified primarily through a series of public meetings, workshops, coordination procedures, and related studies. The various significant concerns identified during the study are briefly described in the following paragraphs.

1.05 Flooding - The primary water resource problem investigated in the Irondequoit Creek study was flooding. The Irondequoit Creek Watershed is subject to flooding of varying degrees in many scattered areas. Preliminary

investigation indicated 20 scattered floodprone areas of probable concern in the watershed. Subsequent studies have identified the degree of flooding that could be expected in these areas. Evaluation of these areas by the Corps of Engineers indicated that three of the areas warranted further Federal investigation. They were Ellison Park, Panorama Plaza, and Bushnell Basin. Of these, only the Panorama Plaza vicinity qualified economically for Federally funded flood protection measures. The Panorama Plaza area is developed with numerous commercial, light industrial, residential, and recreational complexes where flooding is a significant problem.

1.06 Future Flooding - The probability and degree of flooding and the provision of adequate protection was a concern expressed throughout the study. It is anticipated that floods of the same or larger magnitude as those that have occurred could, and in all probability will, occur in the future. Protection will depend upon the limits of the structural measures and/or the success of watershed management policies. This concern is addressed in some detail in the main report of the Final Feasibility Study.

1.07 Obstructions - Obstructions both natural and man-made have been identified as flow restrictive and contributors to flooding problems within the Irondequoit Creek Watershed. Fallen trees and branches sometimes create log jams that dam the creek water and may cause flooding. Removal of these logs and/or creek bank vegetation, however, may adversely impact the aquatic environment which may require the protective shade and cover. Discretion should be utilized in relieving these problems. Man-made obstructions, primarily bridges, may also restrict flows and contribute to flooding problems. The Plaza Extension Bridge and the Old Penfield Road Bridge in the Panorama Plaza vicinity have been identified as flow restrictive. Their possible modification has raised some access concerns. These concerns are addressed in more detail in the main report of the Final Feasibility Study.

1.08 Stream Erosion - Stream erosion problems are few and localized within the watershed and rank behind flood-related problems in severity. Erosion problems were identified in preliminary investigations by public officials from the towns involved in the study (Brighton, Henrietta, Mendon, Penfield, Perinton, and Pittsford). Erosion problems have been addressed in some detail in the main report of the Final Feasibility Study.

1.09 Socioeconomic - Numerous socioeconomic related concerns have been expressed throughout the study. Some of the concerns expressed and items examined included: institutional analysis, community growth, and development concerns (including: population, economic and land use studies), social well-being concerns, and recreational opportunities. Particular concern was expressed relative to:

1.10 Future Developments and Watershed Management - Throughout the course of study, significant concern has been expressed pertaining to future development and land use within the watershed and the need for coordinated watershed management policies. Particular concern pertained to the potential adverse impacts of upstream developments to communities downstream. Some existing programs (flood plain management, flood insurance, etc.) may already contribute toward that goal. Investigations (institutional analysis, land use

programs, etc.) have been conducted in this study by the Buffalo District relative to these concerns.

1.11 Sources of Funding and Local Assurances - The costs, the benefit/cost ratio and analysis, financial responsibilities, and cost distributions were recurring concerns throughout the study, particularly relative to local shares. These issues are addressed in some detail in the main report of the Final Feasibility Study.

1.12 Property Needs - Property needs, easement and right-of-ways, and possible displacement of people and/or institutions have received important consideration throughout the study.

1.13 Social Well-Being - Adequate flood damage reduction measures and protection for the social well-being of the communities, institutions and individuals was of major concern in this study and received major emphasis. This is particularly true for the well-developed area in the Panorama Plaza vicinity. Consideration of impacts to downstream entities was also important. These issues are addressed in sections of the Environmental Impact Statement and in the main report of the Final Feasibility Study.

1.14 Disruption and Relocation of Facilities - Concern regarding responsibility and cost of relocating utilities, as well as the impacts relative to disruption of service and access, received considerable attention in this study. These are primarily local interest responsibilities and are addressed in both this EIS and in the main report of the Final Feasibility Study.

1.15 Recreation - Recreational developments are an important resource to the rapidly developing Irondequoit Creek Watershed region. Several developments exist along the creek and at Irondequoit Bay at its mouth. In the Panorama Plaza vicinity, a development consisting of: two multi-purpose ball fields, a baseball diamond, a play area, and scattered picnic facilities, is being planned by the town of Penfield. It will be located in the available area between the creek and the plaza development. Consideration for these existing and proposed developments was strongly incorporated into the study.

1.16 Aesthetics - Consideration for aesthetic values is also an important concern. Attention has been given to existing views and settings, as well as the blending of any proposed structures to the natural setting, height limitations, and the possibility of mitigating construction disturbance and enhancing the natural appearance of the area through herbaceous and/or woody vegetation plantings.

1.17 Environmental Quality - Consideration to contributions toward environmental quality, where possible, is another important concern identified in this study - particularly with regards to:

1.18 Water Quality - The ongoing Monroe County Pure Waters program has and is expected to continue to improve the quality of water entering the creek. See paragraph 2.15 of Section 2 - Alternatives. This Corps feasibility study addresses water quality relative to the effects of construction (particularly channelization) and altered flows and sedimentation.

1.19 Impacts of Channelization and Disposal of Dredged Material - Concern was expressed about the potential adverse impact of channel dredging in regards to turbidity, possible destruction of aquatic habitat, and other aquatic biological factors. In addition, disposal of dredged material is a significant concern, particularly if the material is classified as polluted. This study investigated these various concerns. See paragraph 5.13 of Section 5 - Public Involvement.

1.20 Natural Resources - Identification and preservation of significant resources was identified as being an important study concern. Coordination with Federal and State environmental agencies was established to insure consideration of their ideas and concerns. See paragraphs 5.07 through 5.13 of Section 5 - Public Involvement. Biological field data has been completed in development of a more current profile of existing conditions. This data is used in fish and wildlife impact analysis. See Appendix H.

PLANNING OBJECTIVES

1.21 Development of the various alternative flood control plans for Irondequoit Creek considered both the two national water resource planning objectives as defined by the U. S. Water Resources Council and a number of study area specific planning objectives developed in relationship to the aforementioned public concerns for Irondequoit Creek.

1.22 The Two National Objectives are:

a. National Economic Development (NED) - Enhancement of national economic development as defined by the Water Resources Council, is achieved through optimum development of water and related land resources. The present and projected needs were assessed in terms of the relationship to flood control and related water resource development. The annual costs of the measures for various purposes should be compared with the annual benefits in order to evaluate plans on the basis of economic efficiency.

b. Environmental Quality (EQ) - Maintenance or enhancement of the quality of the environment is achieved by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems. Among the major components of the environmental quality objective considered include: (1) natural environment; (2) open and green spaces; (3) cultural resources; (4) fish and wildlife; and (5) scenic values. The impact on the fish stocking program could be an item of consideration related to the environmental quality objective. The potential significant impact of stream alteration measures on any wetlands, aquatic life, cultural resource sites, as well as potential for induced future development, are among the major considerations in selection of a viable alternative.

1.23 The planning objectives developed for the Irondequoit Creek Study are to enhance the NED and EQ by the management of the water-related land resource needs on the national, State, and local levels.

1.24 More specifically, the planning objectives to be addressed in this report for a 1980-2030 period of analysis are as follows:

a. To promote flood management techniques to reduce future flood damage economic losses in the Irondequoit Creek Watershed;

b. To provide flood damage reduction measures to protect health, life, and property in the Panorama Plaza area, Penfield, NY, of Irondequoit and Allen Creeks;

c. To provide erosion and sedimentation control to protect stream banks and prevent damage to adjacent property in the Panorama Plaza area of Irondequoit and Allen Creeks;

d. Where possible, to enhance fish and wildlife habitat in and adjacent to Irondequoit and Allen Creeks in the vicinity of the Panorama Plaza.

e. Preservation of significant cultural resources to protect the heritage of the Irondequoit Creek Watershed area;

f. Improve water quality, for game and nongame fish, by reducing amount and frequency of sediment loads from bank overflow and bank erosion in the Panorama Plaza area; and

g. To develop recreational opportunites in the Panorama Plaza area to improve social well-being when environmentally and economically feasible.

SECTION 2

ALTERNATIVES

ALTERNATIVES ELIMINATED FROM FURTHER STUDY EARLY IN STAGE 3 INVESTIGATIONS

2.01 General - The following paragraphs briefly discuss alternatives that were considered (in some detail) during Stage 3 investigations but were partially or totally eliminated from Stage 3 detailed planning. This section also briefly describes why these alternatives were eliminated from further consideration. These alternatives and the reasons for their elimination are described in more detail in the Alternatives Considered Further section in the main report of the Final Feasibility Report.

2.02 Alternative C - Channel/Berm - This alternative would provide both channel and berm improvements. Plate 4 of the main report indicates the berm locations and the extent of channelization for the 100-year protection along Irondequoit Creek for Panorama Plaza. In the channel/berm plan, a wider channel permits the use of berms to replace their larger counterparts - levees. This has the advantage of lower costs and removes the need for a high or access-restricting levee or floodwall. The improved channel dimensions consisted of increasing the width, depth, and cross sectional area of the average channel. In those areas where the improved channel was not sufficient, berms are proposed to be constructed along the banks to give additional height required, to prevent overtopping into the plaza area.

2.03 With this alternative, the Panorama Extension Bridge and the Old Penfield Road Bridge would require removal to maintain a wide and uniform channel, thereby eliminating vehicular access. Major alternative routes to the Plaza area, however, would still be maintained along Panorama Trail Road and Penfield Road. The Harney Printing Shop would also need to be acquired. It would not be practical to protect a building that is presently endangered due to its close proximity to the erosive bank.

2.04 This alternative will not be considered for further study for both economic and environmental reasons. In the previous Stage 2 document (Preliminary Feasibility Report), Alternative C had been identified as the NED plan, which is no longer valid. Severe erosion problems identified by the foundations and materials investigations resulted in the need for extensive erosion protection measures (riprap) along the creeks. This would significantly raise the total first cost of Alternative C and the benefit/cost (B/C) ratio would be far below unity (1.0) making it not economically justified. Alternative C is also not environmentally acceptable due to the extensive channelization and placement of riprap which would significantly adversely impact aquatic and riparian habitat.

2.05 Alternative G - Nonstructural - This alternative would not provide any structural measures for flood control. The nonstructural plans investigated were flood warning, floodproofing, permanent evacuation, flood plain regulation, and flood insurance.

2.06 Flood Warning System - Such a system requires installation of a flood warning device that would be situated far enough upstream in the watershed to give adequate time for evacuating floodprone areas or erecting flood protection measures. The shortness of the warning duration, absence of coordinating agencies, and the diverse resident locations of the parties with interests in the plaza would make flood warning an impractical alternative.

2.07 Floodproofing - This would incorporate permanent and temporary measures such as raising of buildings, sealing of windows, and temporary shields as a means of reducing flood damages. Many of the stores in the plaza have two entrance doorways and loading docks, and the apartment complex has many basement apartments with windows. The sealing of all openings would be unrealistic, while the planning, coordination, and time constraints of placing temporary shields would also be impractical.

2.08 Permanent Evacuation - This proved to be the most effective nonstructural measure, but it was the most expensive plan. Permanent evacuation of the existing developed flood plain involves the acquisition of lands by the purchaser; removal and relocation of improvements; evacuation and resettlement of flood plain residents and, permanent conversions of flood plain lands to uses less susceptible to flood damage. Lands from which structures are removed would eventually provide opportunity for conversion to wildlife habitat or open-space recreation. The strongest opposition to this plan comes from individuals with investments in local businesses and real estate. An evacuation of the plaza would pose inconvenience for many users and economic hardships for some of the business owners. The costs of permanent evacuation would be prohibitive to implement.

2.09 Flood Plain Regulations - This measure, in the form of zoning ordinances and regulations, is designed to discourage or prohibit construction in the flood plain. This plan is not viable in itself because it offers no prevention of flood damages and effects; and, because development is already established in the flood plain.

2.10 Flood Insurance - This measure provides some financial protection to victims of flood-related property damage. Flood insurance, however, does not prevent flood losses but merely compensates the victims. Because one of the planning goals of this study is to prevent flood losses, this plan was not considered as a final solution.

2.11 Although nonstructural alternatives in themselves would not sufficiently satisfy the projects primary planning objectives, certain aspects could contribute to other possible and more feasible alternatives. Floodproofing and evacuation measures have been incorporated into Alternative B, the levee/floodwall alternative, for several structures and facilities where they appear to be more applicable. Flood Plain Management and Flood Insurance programs and policies, in the long term, would contribute toward meeting the planning objectives to some degree in themselves, or in conjunction with the other considered alternatives. These aspects of the nonstructural alternative may be improved upon and have been investigated in still further detail as a nonstructural alternative in this respect. See the Plans Considered in Detail section of this Environmental Impact Statement.

WITHOUT CONDITIONS (NO-ACTION)

2.12 Without Conditions - General - It is anticipated that floods of the same or larger magnitude, as those that have occurred, could and in all probability will occur in the future. From the Corps of Engineers Flood Damage Survey Report completed in 1977, a total of 76 commercial businesses, 24 residential structures, and five public utilities may be affected by a flood exceeding a 25-year frequency. (Preliminary Feasibility Report, 1979).

2.13 The population in the town of Penfield has increased from 12,601 in 1960 to 23,782 in 1970. Although the town has experienced a tremendous rate of growth over the last 30 years, this growth rate has slowed down in recent years due to the high intensity of development in the town and the diminishing numbers of job opportunities in the Rochester area. In conjunction with increased population, demand for housing is expected to increase, but at a somewhat slower rate. (Monroe County housing is up 25 percent since 1970.) The economy of the area is considered strong and the per capita income is well above the national average. This economic trend is expected to continue, unless unforeseen adverse economic impacts should occur.

2.14 The land use patterns of the Panorama Plaza area are strongly influenced by the rapidly expanding Rochester suburban area. While the suburban characteristics of the area have increased, there has been a corresponding decrease in rural characteristics. This trend is expected to continue within the confines of the local zoning regulations and the available space for development. The Panorama Plaza area is densely developed with commercial, light industrial, and residential use. Almost every available land parcel within the 100-year flood plain is developed with the exception of a strip of fields and heavy woody vegetation along the creek banks. Although new structural development is currently prohibited in the Panorama Plaza area by the town, modification to existing structures is unregulated (Final Feasibility Study). Presently, the town of Penfield is developing plans for a small park development consisting primarily of picnic facilities and several athletic fields. This would be located in the available land area located behind Panorama Plaza. An application has also been made to the Penfield Planning Board, for expansion of existing buildings in Panorama Plaza.

2.15 The upper reaches of Irondequoit Creek provide habitat for valuable cold water fisheries and are designated as trout waters by the NYS Department of Environmental Conservation. This creek contains brown trout and rainbow trout. The rainbow trout are known to migrate upstream through the Panorama Plaza Project Area during spawning runs. In the future, water quality conditions in the creek are expected to improve with the enactment of the Monroe County Pure Waters - Sewage Diversion Program, which will reduce the discharge of sewage effluent into the creek. With improved water quality, there is the possibility of increased or extended trout utilization of the project area (DEC and F&WL correspondence).

2.16 As a result of continual suburban encroachment on or near existing riparian wildlife habitat along Irondequoit and Allen Creeks, this habitat type is diminishing in size and is increasingly exposed to increased human

activity. Consequently, either direct or indirect disruption of riparian habitat intensifies pressure upon wildlife species, which either displaces them or could affect their productivity during breeding season.

2.17 Without Conditions - No-Action - In any plan formulation, a no-action plan is always considered. This plan implies that the Federal Government, acting through the Corps of Engineers, will take no action to reduce flood damage in the Panorama Plaza Area of Irondequoit Creek. Should this occur, other entities might contribute to meeting some of the planning objectives previously outlined. Various Federal, State, regional, and local agencies are responsible for implementation and guidance in various aspects of planning and future development. See the section of Institutional Analysis in the Final Feasibility Report. Studies, reports, and policies have been and are being established related to Flood Plain Management, Flood Insurance, and future growth and development within the Irondequoit Watershed. (See sections entitled: Prior Studies and Reports, Reports and Studies of Others, Previous Projects and Improvements and Nonstructural Alternatives of the Final Feasibility Report.) These studies and reports provide valuable information and policies related to future planning and developments in the Irondequoit Creek Watershed.

2.18 The Corps identified the Monroe County agency responsible for implementing New York State's 208 program as a likely entity to act as a likely central body for future coordination; although a number of other agencies/programs exist that could contribute and provide guidance in various aspects of watershed management. Section 208 of the Federal Water Pollution Control Act of 1972 (PL 92-500), as amended by the Clean Water Act of 1977 (PL 95-217), gives authority to States and/or designated metropolitan areas within a State to conduct the water quality planning. The law is administered by and chiefly financed through the U.S. Environmental Protection Agency. The Department of Environmental Conservation of New York State was selected as the 208 planning agency by the Governor of New York. The program provides for areawide planning to be conducted by locally representative agencies within designated areas where severity of pollution problems and local governmental intent to implement the regional plan make this a feasible alternative. Development of areawide waste treatment programs under Section 208 is a means to promote areawide waste management systems and areawide planning for growth and land use controls relative to waste management needs. It should be emphasized that the scope of such programs goes beyond sewage treatment facilities to encompass prevention of waste management problems. Growth and land use considerations would be a major element in determining waste treatment management needs.

2.19 Flood plain regulations in the form of zoning ordinances and regulations in the town of Penfield are designed to discourage or prohibit construction in the flood plain. Although new development is currently prohibited in the Panorama Plaza area by the town, modification to existing structures is unregulated. During these modifications, the value of the structure and contents could increase enough to significantly increase flood damage should a flood occur. Flood insurance provides some financial protection to victims of flood-related property damage. It, however, does not prevent flood losses but merely compensates the victims. A flood insurance

report was completed for the town of Penfield in 1977. Members of the community are eligible to buy flood insurance under the National Flood Insurance Program, providing they meet the established requirements of the program. These policies are expected to be continued and improved and would eventually result in compensation for existing flood damage losses and redevelopment of the area to low flood damage uses. These, however, are long-term policies and would do little to prevent flood damage to the already existing developments.

2.20 Should the no-action plan be implemented, it is possible that local governmental or private interests would initiate varying degrees of protection for the Irondequoit Creek Watershed and more specifically the Panorama Plaza project area. It is anticipated however, that such an endeavor would be lacking in degree of protection, technical expertise, and adequate funding. Except for this study, there are no known or proposed Federal, State, or local flood control projects in the watershed.

PLANS CONSIDERED IN DETAIL

2.21 General - The following discussion centers on plans that were developed and refined during late Stage 3 planning efforts. The development of detailed plans involves redetermining the costs and benefits of each plan, redefining the features and dimensions of each plan, and determining the primary environmental impacts of each plan. For a more detailed description of these plan alternatives see the section entitled Alternatives Considered Further in the main report of the Final Feasibility Report.

2.22 Alternative A - No-Action Plan - The no-action plan implies that the Federal Government, acting through the Corps of Engineers, will take no action to provide flood damage reduction measures along Irondequoit Creek. This is a nonstructural alternative and must be carried forward through the planning process. Under this plan, the base condition at Panorama Plaza would remain unchanged. While no environmental impacts would be created, the potential for flood damage in the project area would remain the same. See the previous section - Without Conditions.

2.23 Alternative Plan G - Nonstructural (Flood Insurance and Flood Plain Management) - Both flood insurance and corresponding flood plain management regulations are being implemented in the town of Penfield. These policies have been considered to some extent in Alternative A, the No-Action alternative, (Without-Conditions). Alternative G, however, stresses that measures and their implementation can and should be improved through continued participation in the National Flood Insurance Program.

2.24 The National Flood Insurance Program consists of two separate phases, the Emergency program, and the Regular program. The town of Penfield is currently enrolled in the Emergency program. To be eligible for this program, the community must have a functioning building and zoning permit and must pass two resolutions; one, essentially voicing interest in joining the program, and the other initiating permit reviews to determine whether proposed building sites will be reasonably safe from flooding. This determination is made primarily through the utilization of a Special Flood Hazard

Boundary (SFHB) map produced by the Federal Insurance Association (FIA). If determined to be in a flood hazard area, protective or restrictive measures must be implemented.

2.25 Alternative G implies that the towns should work toward enrollment in the Regular program. This generally entails production of a Flood Insurance Rate Study through FIA. This study uses standard hydrologic and hydraulic techniques to determine flood profiles and delineations to identify a proposed floodway. The elevations, etc., resulting from this study become the official levels both for insurance purposes and for flood plain management. Two corresponding maps are produced; one is used for insurance rating purposes, the other is used as a flood plain management tool. In addition, the community must adopt flood plain management regulations that will comply with FIA standards. These regulations are congruently provided in several different forms including statutes, zoning ordinances, and building codes. These will ensure precise and enforceable regulations necessary for an effective flood insurance program.

2.26 Alternative G has been examined as a nonstructural alternative and is viable since it builds upon existing policies in the town of Penfield. The primary intent of the program or alternative is, (1) to provide compensation for flood damages to existing developments, and (2) to discourage future damageprone developments in floodprone areas. This is a long-term alternative, however, and would not sufficiently satisfy the more specific and immediate needs of the Panorama Plaza vicinity. It, therefore, was not considered as a viable solution in this area. For more details see the Alternatives Considered Further Section of the Final Feasibility Report.

2.27 Alternative B - Levee/Floodwall - Under this alternative, a series of levees or floodwalls would be constructed along several thousand feet of Irondequoit and Allen Creek. (The approximate location of these improvements may be identified on Plate 5 in the main report of the Final Feasibility Study.) They were set back from the creek banks to preserve and/or improve the existing riparian environment. A proposed park/ballfield development is also incorporated into the plan and provides a low damage flood plain to the flood damage reduction system. These measures would essentially contain floodwaters and thus prevent flooding in the project area up to, and in some, excess of a 500-year flood event.

2.28 Levees were given primary consideration over floodwalls and channelization because of their lower costs and reduced adverse impacts to the natural environment. They would range in size from about 1.0± feet to 8.5 feet in height, have 10-foot crowns, 1 on 2.5 graded sideslopes and base widths of from 15.0± feet to 53 feet. In one case, along Irondequoit Creek where a levee was not feasible, a steel sheet piling and concrete floodwall was incorporated. It would range in height from about 1.5± feet upstream to 7.5± feet downstream.

2.29 Internal drainage would be collected by ditches constructed along the backside (side away from the creek) of the levee or floodwall paralleling the creek. Culverts would be used at downstream collection points to allow the internal water to flow by gravity back into the creek. Each culvert

would include a flapgate and an emergency sluicegate to prevent a backup of creek waters into the interior basins. For approximate locations and further information see Plate 6 - Internal Drainage, in the main report of the Final Feasibility Study.

2.30 Some channelization realignment is also necessary along Allen Creek to provide additional area for levee construction. The newly aligned channel would extend along Allen Creek from its confluence with Irondequoit Creek to about 900± feet upstream. The channel would have a 30-foot bottom width, with 1 on 2.5 sideslopes and would cut a gradient to match the lower elevation of the 3-foot drop structure incorporated to reduce excessive stream flow velocities. The new channel will be completely riprapped, and primarily for environmental reasons would incorporate, construction of a permanent low flow channel, inclusion of pooling and riffle areas, and vegetation plantings to reduce soil erosion sedimentation, and to provide riparian shade cover.

2.31 This alternative would be designed and constructed by the Corps of Engineers through the Federal and local funds and generally maintained by local interests. For a more detailed description of Alternative B and its implementation see the Plans Considered in Detail Section of the main report of the Final Feasibility Study.

THE NED AND EQ PLANS

2.32 The Principles and Standards for Planning Water and Related Land Resources, established by the Water Resources Council in 1973 (revised 1979), require a framework for the systematic preparation and evaluation of feasible plans for addressing problems, needs, concerns, and opportunities under equal objectives of National Economic Development (NED) and Environmental Quality (EQ). See Section 1 - paragraph 1.22.

2.33 The (NED) Plan is the plan that returns the most economic net benefits on an average annual basis. Preliminary investigations indicated that Alternative C, the Channel/Berm alternative, would provide the greatest economic efficiency. Subsequent soils investigations, however, determined that extensive erosion protection measures would be required to implement this alternative, which significantly increased the estimated cost of construction, thereby eliminating Alternative C as the (NED) Plan. Since Alternative B - Levee/Floodwall is now more economically efficient, it has been identified as the (NED) Plan.

2.34 The (EQ) Plan is the plan that provides the greatest net positive benefits to the quality of the natural environment. Alternative A and Alternative G are closely related and both would be environmentally oriented. Environmental benefits, however, would be long-term and neither plan would significantly address the immediate environmental or other planning objectives for the project area. Alternative B, however, with incorporation of several environmental measures now provides the greatest positive environmental benefits to the project area and is therefore also identified as the (EQ) plan. See Table A and Table B in Section 2 - Alternatives and see Section 4 - Environmental Effects, in this EIS.

THE PREFERRED PLAN

2.35 Alternative B - Levee/Floodwall at a 500-year level of protection, has been identified as the selected plan because compared to the other feasible alternatives, it best satisfies both the (NED) and (EQ) objectives of the project. See the System of Accounts - Table 8 of the main report of the Final Feasibility Study, and the following section.

COMPARATIVE IMPACTS (EFFECTS) OF ALTERNATIVES

2.36 Table A - Environmental Effects - Summary Matrix helps in comparatively examining the potential effects of the Stage 3 alternatives to the Natural Environment, and Human Environment of the Panorama Plaza vicinity. This table and the examination, assessment, and evaluation of alternatives through these criteria, contribute to the system of accounts and plan selection in Stage 3 planning. These items are discussed in more detail in Section 4 - Environmental Effects - of this Environmental Impact Statement (EIS). See table, next page.

2.37 Table B - Comparative Impacts to Items of Significant Concern summarizes the major impacts of Stage 3 alternatives to items (resources) identified as being of significant concern. See Section 3 - Affected Environment (Significant Resources) - of this EIS. These items are also discussed in more detail in Section 4 - Environmental Effects - of this EIS. See table, following pages.

Table A - Environmental Effects - Summary Matrix

Irondequoit Creek	Without	Alternative C	Alternative B
	No Action	Flood Plain Management Flood Insurance	(500-Year) Levee/Floodwall
Natural Environment			
Topography	0	0	altered
Man-made Resources	0	0	0
Natural Resources			
Air Quality	0	0	Short term -
			Long term 0
Water Quality	+	+	Short term -
			Long term 0
Sedimentation	0	0	Short term -
			Long term +
Aquatic Vegetation	0	0	Short term -
			Long term 0
Benthos	0	0	Short term -
			Long term +
Fisheries	0	0	Short term -
			Long term +
Wet Lands	0	0	0
Terrestrial Vegetation	0	0	Short term -
			Long term +
Wildlife	0	0	Short term -
			Long term +
Endangered Species	0	0	0
Human Environment			
Man-made Resources & Flood Protection	0	+	++
Cultural Resources	0	0	0
Noise	0	0	Short term -
			Long term 0
Aesthetic Values	0	0	-
Population (Density & Mobility)	-	+	+
Displacement and Acquisition	0	0	-
Community Cohesion	-	+	++
Community Growth	-	+	++
Institutional Relationship	0	altered	altered
Health and Safety	-	+	++
Leisure Opportunities	+	+	+
Land Use	-	-	+
Public Facilities	-	-	Short term -
			Long term +
Public Services	-	-	Short term -
			Long term +
Transportation	-	-	Protection +
			Access -
Tax Revenues	-	-	+
Property Values	-	-	+
Desirable Regional Growth	-	-	+
Employment/Labor Force	-	-	+
Business Industrial Activity	-	-	+
Displacement of Farms	0	0	0

Potential Adverse Impacts
-- major significance
- moderate significance

0 no impact (adverse), or insignificant impact (beneficial)

Potential Beneficial Impacts
+ moderate significance
++ major significance

Table 8 - Comparative Impacts to Items of Significant Concern

	Fish and Wildlife	Water Quality	Panorama Plaza Development	Plan Economics
Base Condition	There is substantial riparian wildlife habitat in the area. Hardwoods and shrubs intermixed with herbaceous vegetation form an almost continuous band of vegetation along both sides of the creek which provides habitat for many wildlife species. Valuable fisheries exist.	Irondequoit Creek is classified as "B" water suitable for: bathing, fishing, fish propagation and secondary contact recreation. Upstream of the project is also classified as "T"; suitable for trout survival.	The area is well developed with commercial, industrial, and apartment residential complexes. The developments are relatively new, well maintained and socio-economically well. Several transportation routes (roads) traverse the area.	Existing Potential Average Annual Damages: $764,000.
Alternative A Without Conditions (No-Action)	Riparian habitat would become more valuable because of continued plaza development pressures. With improved water quality fishery resources would expand and improve.	Water quality should continue to improve in the project area and in the watershed because of water quality improvement programs, including the newly constructed 54-inch interceptor system in the Panorama Plaza.	Periodic flooding would continue. Damages would depend on degree of flooding and types of protection provided other than through this project. Flooding could periodically disrupt normal community function including facilities and services.	N.A.
Alternative C Nonstructural (Flood Insurance & Flood Plain Management)	Similar to Alternative A. Would be lesser degree of adverse impacts due to increased developments because of development restrictions.	Similar to Alternative A. Would be lesser degree of adverse impacts due to increased developments because of development restrictions.	Similar to Alternative A. Would be lesser degree of increased development due to development restrictions. Would be greater compensation for flood damage losses.	N.A.
Alternative B Levee/Floodwall (500-Year)	Would impact primarily upon terrestrial habitat and wildlife during construction period. Revegetation may replace some, all, or enhance habitat. Some sedimentation due to construction.	Water quality would deteriorate during construction period due to increased sedimentations and equipment deposits. (short-term)	Would provide a positive degree of flood damage reduction for the Panorama Plaza vicinity. Required land acquisition ± 22 acres Relocation of Harney Printing	For 500-year protection Total Federal Cost $3,312,000 Total Non-Federal Cost 1,588,000 Total Project Cost $4,900,000 Average Annual Benefits 743,190 Average Annual Cost 456,700 Net Average Annual Benefits 286,490 Benefit/Cost Ratio 1.63 (March 1981)

Table B - Comparative Impacts to Items of Significant Concern
(Cont'd)

	Sewer Interceptor	Plaza Extension Bridge	Old Penfield Bridge	Genesee Conservation Club
Base Condition	Intercepts and provides chemical treatment of flows that previously flowed directly into the creek. Newly constructed 54 ± inch line.	Culvert-concrete structure. Provides access (road) between Panorama Plaza and Sybron/ Nalge Co. Culvert capacity restricts high water stream flows.	Warren through truss bridge built about the turn of the century by the Phoenixville Ironworks. Provides access route (road) between plaza and upper Old Penfield Road vicinity. Alternative access route available.	Sportsmen & Conservation Club. Approximately 11 acres may flood during 100-year event. Flooding is partially alleviated by weir action into Quarry Lake. No damages to club house. Club house First floor Elev. 270.22. 100-year event Elev. 268.80. 500-year event Elev. 270.1
Alternative A Without Condition (No-Action)	No significant change. Periodic flooding may disrupt normal operation.	Would probably remain. Flow restrictive.	Would probably remain. Flow restrictive.	Periodic flooding would continue. Minor damages could be incurred to the caretakers house and the access road would be inundated during a 100-year event. Due to the club house first floor elevation damage would be minimal. Structural floodproofing measures would minimize damages.
Alternative C Nonstructural (Flood Insurance & Flood Plain Management)	Same as for Alternative A.	Same as for Alternative A.	Same as for Alternative A.	Similar to Alternative A. Possible flood damage compensation through insurance program.
Alternative B Levee/Floodwall (500-Year)	May require minor modification, right-of-ways (construction over pipeline) and access. (raise manholes, etc.). Will require some flood-proofing.	Bridge to remain for maintenance and pedestrian access only. Bridge would serve as a drop structure decreasing flow velocities during high flow periods decreasing erosion tendencies. Alternative access routes are available.	Draft reports provide for the bridge to remain with pedestrian access only. Further consideration however, will be given to the feasibility/possibility that vehicular traffic would be maintained under normal (non-flood conditions but would be temporarily detoured during flood conditions. The details of this will be determined in development of detailed plans and specifications. Adequate alternative access routes are available for any alternative	Would not significantly increase flooding potential to the vicinity. May slightly increase high flows to Quarry Lake. Unfavorable B/C ratio in the vicinity.

Table B - Comparative Impacts to Items of Significant Concern
(Cont'd)

	Quarry Lake	Ellison Park	Wetlands (Downstream)	Irondequoit Bay
Base Condition	Gravel Quarry - Operational. During high flows, 3 feet ± bank between the lake and creek acts as a weir. Water flows over bank, into lake, then back to creek downstream. Weir: 263.0 Lake Level: 256.5±	Large areas of the park act as flood plains during spring flooding. Minimal damages.	N.A.	N.A.
Alternative A Without Condition (No-Action)	Continued quarry operations. Future development proposals include residential and recreational development of adjacent lake properties. Natural weir action would continue.	No significant change.	N.A.	N.A.
Alternative C Nonstructural (Flood Insurance & Flood Plain Management)	Similar to Alternative A. Flood Insurance and Flood Plain Management policies may restrict future developments.	Development restrictions may preserve existing conditions.	Development restrictions may preserve existing conditions.	Development restrictions may preserve existing conditions.
Alternative B Levee/Floodwall (500-Year)	Minor increase of weir flows into, through, and from Quarry Lake. Would require drainage easement in weir vicinity. Lake Level: 256.5±	No significant change.	No significant change due to project.	No significant change due to project.

SECTION 3

AFFECTED ENVIRONMENT

INTRODUCTION

3.01 The Irondequoit Creek Watershed is located in Monroe, Ontario, and Wayne Counties in Central New York. The watershed drains an area of 139 square miles. The main stem of Irondequoit Creek has a total length of approximately 32 miles.

3.02 The Irondequoit/Allen Creek flood plain within the limits of the proposed project begins at the downstream side of the Route 441 Bridge and ends downstream of the Old Penfield Road Bridge. The flood plain in the project area extends 0.90 mile on Irondequoit Creek and includes 0.20 mile on Allen Creek upstream from its mouth. It varies from about 3,000 feet to 350 feet in width, with an area of approximately 150 acres. Plate 1 of the main report delineates the 500-year and Standard Project Flood flooded areas in the Panorama Plaza area.

ENVIRONMENTAL CONDITIONS

3.03 The topography of the Irondequoit/Allen Creek flood plain within the limits of the proposed project (Panorama Plaza) is typically flat and is generally surrounded by sudden and steep embankments. The valley has a thick blanket of glacial debris consisting mainly of sand and gravel deposited by glaciers during the Pleistocene Epoch. Five soil types or classifications are found in the vicinity of Irondequoit near Panorama Plaza. They are: Collamer Silt Loam; Arkport, Dunkirk, and Colonie Soils; Genesee Silt Loam; Alluvial Lands; and Pits and Quarries. The banks of Irondequoit Creek in this area are composed of alluvial lands. Alluvial lands being formed by floodwaters are composed primarily of fine sands and silts.

3.04 The Rochester/Irondequoit Creek area is characterized by rather severe continental climate. Weather patterns are complex and change rapidly due to its mid-continental location between the source regions of contrasting polar and tropical air masses. The meeting of and complex interactions of these air masses in mid-continental regions can cause the development of major storms in less than 24 hours. The waters of Lake Ontario exert a stabilizing effect on air temperatures of the Rochester areas. Average monthly temperatures reach a high of 71°F during July and a low of 24°F during February. Precipitation along the south shore of Lake Ontario averages 34.5 inches a year. At Rochester for the period 1931 to 1970, the average annual precipitation rate was 31.3 inches. Prevailing winds are from the west and southwest. The average annual hourly wind velocity at Rochester is 9.6 mph.

3.05 Four levels of air quality are used by New York State. They are based upon general levels of social and economic development and pollution potentials in a given area. Assigned to each classification level are generalized land uses. Most of the watershed, including the proposed project area, is classified Level II. Associated land uses for Level II are predominately

single- and two-family residences, small farms, and limited commercial services and industrial development.

3.06 The Panorama Plaza study area is characteristic in demography and development to that associated with the growing Rochester/Penfield area. It is a viable, well-developed area. Commercial usage is predominant, with the other land uses being manufacturing, residential, recreational, and vacant nonagricultural. The right bank of the Irondequoit Creek development consists of Panorama Plaza, and includes several supermarkets, a theater, fast food restaurants, automobile service stations, and other commercial outlets. There also exists the Brook Hill and Penfield Park apartment buildings just downstream of the plaza, with several homes and small business buildings in the area. The left bank consists of an automobile dealership, the Sybron/Nalge Corporation, several light manufacturing entities, and along Allen Creek, Camp Haccamo. Community facilities and services are readily available, and the town of Penfield Department of Parks and Recreation is developing plans for park and ball field facilities on the available land behind Panorama Plaza. The development, therefore, offers numerous goods, services, and opportunities to the surrounding community. See Plate 5 of the main report.

3.07 There is substantial riparian wildlife habitat in the area despite the proximity of residential, commercial, and industrial development. Hardwoods and shrubs intermixed with herbaceous vegetation, form an almost continuous band of herbaceous and woody plant species along both sides of the creek, which ranges from a narrow strip in some areas to wider bands extending landward from the creek bank. A more extensive wooded area is located on the west bank where Penfield Road crosses the creek. These relatively undisturbed vegetated areas along the creek provide habitat for songbirds, waterfowl, small mammals, and other wildlife (U. S. Fish and Wildlife Service letter dated 1 June 1979). For further information, see Appendix H.

3.08 The Department of Environmental Conservation personnel in Avon, NY, have indicated that valuable fisheries resources exist in the upper reaches of Irondequoit Creek. The upper areas of the watershed are classified as trout waters and steelhead have been stocked (This stocking program is being terminated to determine if natural populations will become established). Upstream from the project area, a good population of stocked and wild trout exists, and rainbow trout are known to pass through the project area in spawning runs.

3.09 The fishery of the project area is depicted as, and a biological survey report concludes (reference Appendix H) that, the project area is one of temporary residence for nearly all species present. These species enter the area to spawn or while enroute to other spawning areas but leave shortly thereafter. There is little habitat present for adults or juveniles - the biological study acknowledging little food, limited undercutting of banks, and no deep pools for adult game fishes. Thus, with the exception of a few resident sunfish and minnows, the fishery of the area exhibits a series of immigrations and emigrations by recorded species.

3.10 Spawning activity of Chinook salmon, rainbow trout, and brown trout was documented by the Contractor; the reproduction success, however, could not be. These spawning areas and activities (located in the upper reaches of Station 1 near the Route 441 Bridge and in the lower end of Station 3 downstream from the confluence of Allen and Irondequoit Creeks) indicate that, if stream conditions continue to improve, successful production of some salmonids could be expected within the project area.

3.11 The water within the project area is classified as Class B water under the present New York State Water Classification System, which indicates that the water is suitable for bathing. The water upstream is classified BT, indicating that the water is suitable for bathing and survival of trout populations. In recent years, the newly constructed sewage treatment facilities have diverted much effluent away from the creek, thereby contributing toward improvement in water quality to some degree. However, nonpoint source contaminants are present in the runoff and have an effect on the water quality throughout the watershed. (For further information relative to existing conditions, see Appendix H - Biological Survey).

SIGNIFICANT RESOURCES

3.12 No resources protected by Federal or State mandates would be affected by any Corps undertaking at Irondequoit Creek. Although the project area is within the range of several animals protected by the Federal Endangered Species Act, including bald eagle and Indiana bat, there have been no sightings of these protected species in recent times. The lack of undisturbed habitat in the area makes the appearance of such a species, other than in transit, improbable. No Federal or State endangered plant species have been observed in the project vicinity.

3.13 Unaffected Section 122 Guidelines Parameters - Section 122 of the River and Harbor and Flood Control Acts of 1970 (PL 91-611) require that at least 17 specific environmental factors be identified and evaluated in relation to the proposed project. The following parameters covered by Section 122 - noise, displacement of farms, air quality and water quality - were analyzed in relationship to the proposed project. It was determined that the proposed action will have no significant impact on these parameters.

3.14 Affected Section 122 Guideline Parameters - The proposed action will impact on the following Section 122 guideline parameters - aesthetics, community cohesion, desirable community growth, tax revenues, property values, public services, public facilities, desirable regional growth, employment, man-made resources, natural resources, business and industry, and displacement of people. These parameters are discussed below, and in more detail in the Environmental Effects Section. Reference Table A and B for additional evaluations.

3.15 The Department of Interior Fish and Wildlife Service and the NYS Department of Environmental Conservation, the primary environmental planning coordinating agencies for this project, have indicated the significance of maintaining the natural aspects of the creek setting in the Panorama Plaza vicinity. The creek in this vicinity presently is used by various migrating

fish species. Should water quality and stream conditions improve, it would be expected that successful reproduction of salmonids is likely. In addition, the already limited vegetation and terrestrial habitat makes its preservation significant.

3.16 The initiation of this project study is testimony to the importance of the community development and cohesion within the project area as a significant socioeconomic resource. The multiple industrial, commercial, residential, and recreational developments provide jobs, goods, services, homes, and other opportunities to the community. The expressed desires for the protection of these developments were evident from local interests at all of the public and informal planning meetings. The items of expressed significant concern included: fish and wildlife resources, water quality, the Panorama Plaza developments (in general and specific), plan economics, the newly constructed sewer interceptor, the plaza extension and Old Penfield Road bridges, the Genesee Conservation League, Quarry Lake and areas downstream including Ellison Park, Wetlands (downstream), and Irondequoit Bay.

SECTION 4

ENVIRONMENTAL EFFECTS

4.01 Introduction - This section addresses the environmental effects of the alternative flood damage reduction measures considered in Stage 3 planning efforts. This section is divided primarily into three parts: Effects on the Natural Environment; Effects on the Human Environment (including Cultural Resources and some economic aspects) and Additional Items of Concern. These effects are categorized similar to those items identified in ER 1105-2-105 - 122 Guidelines. Immediate impacts of construction are included when relevant. Effects to significant resources identified in Section 3 - Affected Environment - are included within these categories. Summary comparative effects and impact tables are included in Section 2 - Alternatives - of this EIS.

EFFECTS ON THE NATURAL ENVIRONMENT

4.02 Topography - Alternative A, the no-action alternative, and Alternative G, the nonstructural alternative, would not be anticipated to cause any significant impacts to topography within the project area.

Alternative B, the levee and floodwall alternative, would alter the topography of the area as follows: Existing creek banks in Allen Creek, as well as disturbed bank areas in the vicinity of the Penfield Road and Old Penfield Road Bridges, would be graded to a 1 on 2.5 slope. Two bank areas downstream of the Old Penfield Road Bridge (riprap protection areas) will be similarly graded and sloped. Allen Creek will be dredged from its confluence with Irondequoit Creek, upstream for 900± feet. The dredging, resulting in gradation of the creek bottom, along with implementation of a drop structure, will cause the water in the creek to drop 3 feet at a point 850± feet upstream of the confluence. Some cut, fill, and gradation will also be required along Allen Creek (particularly along the west bank - 2,000 cubic yards of clean, compacted fill) to allow for placement of riprap. See the description of Alternative B in the main report of the Final Feasibility Study.

There will be levee or floodwall sections constructed along both creeks to contain floodwaters. Detailed locations of these structures are located on Plate 5. The levee sections are designed with trapezoidal cross sections having sideslopes of 1 feet vertical on ..5 feet horizontal with a 10-foot wide crown. For the 500-year level of protection, the proposed levees will range from 1 foot to 8.5 feet in height, including freeboard with a respective range of base widths of 15 feet to 52.5 feet. The concrete floodwalls will range from 1.5 feet to 7.5 feet in height.

Material Resources - Approximately 18,400 c.y. of bank and bottom material (Alluvium) would be excavated from Irondequoit and Allen Creeks. This would be disposed of in a NYSDEC approved upland disposal site. Major construction materials would consists of approximately: 2,000 c.y. of riprap (18 inches with 6-inch graded bedding), 700 c.y. of concrete (floodwall), 19,600 c.y. of levee construction material, and 15,700 s.f. of sheetpiling

(floodwall and drop structure). These materials, which must meet design specifications, will probably be obtained from local sources (within 20 miles). Specific resource locations cannot be identified until a Contractor is selected. Reference Appendices: A - Cost Estimate, D - Design, E - Geotechnical, and H - 404 Evaluation.

4.03 Man-Made Resources - No man-made resources of natural characteristic (wetlands, marshes, etc.) exist in the project area.

4.04 Air Quality - The no-action alternative and Alternative G would not be anticipated to cause any significant impacts to air quality within the project area.

Alternative B would cause temporary increases in air pollution levels caused by emissions from construction vehicles and related construction dusts.

4.05 Water Quality - The no-action alternative and Alternative G would not be anticipated to cause any significant impacts to water quality within the project area.

Alternative B would result in increased turbidity, minor introductions of oil and grease from construction vehicles, and minor increased sedimentation in downstream areas. These effects will be caused by dredging, sloping of banks, and the placing of fill. However, these impacts are expected to cause only a minor and temporary degradation to the quality of water within the project area and should return to preconstruction conditions soon after construction is completed.

An elutriate test was performed to determine if the proposed dredging could result in significant detrimental effects to the project area by the disturbance of bottom sediments and the possibility of resuspending potential toxins into the water column. The analysis showed that levels of heavy metals and pesticides present in the samples taken from Allen Creek were negligible when compared to Federal National Interim Primary Drinking Water Standards. Also, the silt content in the Allen Creek samples was low, indicating that large quantities of fine particle siltation that could be caused by dredging would not be anticipated.

4.06 Wetlands - There are no wetlands located within the project limits, therefore, no direct significant impacts are anticipated on such habitat by any of the proposed alternative plans. Irondequoit Creek does, however, flow through wetlands approximately 5 miles downstream of the project area before entering Irondequoit Bay. Due to the distance and anticipated minor sedimentation caused by construction, the effects to these wetlands are expected to be minor and temporary.

4.07 Benthos - Alternative A, the no-action alternative, and Alternative G, the nonstructural alternative, would not be anticipated to cause any significant impacts to the benthos within the project area.

Alternative B, the levee/floodwall alternative, will unavoidably cause destruction of some existing benthos along portions of Irondequoit Creek.

The areas where construction will take place are outlined on Plates 2 and 3 in the main report of the Final Feasibility Study. Existing erosion prone sandy areas will be excavated or graded, and then covered with stabilizing bedstone and riprap. This would result in some destruction of the existing benthos in these areas and probably cover some existing downstream benthic organisms as silt and sediment settle out. These minor impacts are anticipated to be offset by the introduction of rock riprap that should allow for a more stable bottom and side bank habitat with increased rough submerged surface area for potential recolonization by benthic organisms.

The benthos in Allen Creek, along the channel section 900± feet long, would be destroyed by removal of channel bottom materials during excavation. The channel bottom and side banks would then be graded and covered with bedding stone and riprap. Although this construction will eliminate the existing benthos, the stone and riprap would provide long-term stability and increased rough surface area in this reach of the creek for benthic organism recolonization.

It should be noted that reference to the Biological Survey - Appendix H indicates that benthic field surveys showed a paucity of benthic individuals and a lack of species diversity. This data substantiates that probably only minor impacts on benthic life would result from construction while, possibly some enhancement due to increased surface area and introduction of stable habitat could result.

4.08 Fishery - Alternative A, the no-action alternative, and Alternative G, the nonstructural alternative, it is anticipated, would not cause any significant impacts to the fishery within the project area.

Alternative B, the levee/floodwall alternative, would alter small areas along Irondequoit Creek where some bank grading and placement of riprap will take place (Plate 5). Such areas of creek bank and channel would be converted from erodible sand to stable stone. Construction and related increased noise, turbidity, and sedimentation would probably temporarily displace fish from the area.

As stated in the Biological Survey Report, Appendix H, there is a limited permanent fish population present in the project area. Therefore, impact on fisheries is anticipated to be minor if construction is timed so that it does not interfere with spring or fall migrations when fish populations are increased in the creek. Upon completion of construction, a number of displaced fish would likely return to the area. New submerged cover for use by fish would be provided in cavities created by placement of bedding and riprap stone.

The proposed modifications to the Allen Creek tributary will be more extensive. The plan calls for channelization and riprap (both bottom and sides) for 900± feet, and introduction of a 3-foot drop structure near the upper limit (850± feet) of the riprapped channel. Channelization would probably displace and/or kill game fish in the construction reach. Again, however, as stated in the Biological Survey Report, there is limited resident

population within the area of the creek tributary sampled and, if construction is scheduled not to interfere with fish migrations, only minor adverse impacts on fish life should be anticipated.

Close coordination with the Fish and Wildlife Service and NYS Department of Environmental Conservation biologists on this problem area has resulted in incorporation of several mitigative elements to the channelization measure. It has been determined that the channelization would still essentially follow the creek's natural meander and that a narrower channel with a 3-foot drop structure would be less prohibitive to fish migrations. The drop structure would also help to provide aeration to the creek and probably create a pool at the base of the structure for enhancement of the fish habitat. In addition, pools 3 to 4 feet in depth, and a low-flow channel will be constructed to provide cover and access in the creek - especially during low-flow periods.

There were two areas identified in the Biological Survey Report as sites where salmonid spawning signs existed and spawning nests (redds) were constructed. No reproductive success could be documented. These two areas will experience no direct construction. Site one is located at the Route 441 Bridge, and no direct adverse impacts are anticipated. Site two is located downstream of the confluence of Allen and Irondequoit Creeks. It is anticipated that this area will experience temporary increased sedimentation and related construction disturbances and may cause fish to avoid the area for one spawning season.

Both Irondequoit and Allen Creeks are well-shaded, which is a critical factor in reducing creek temperatures during low-flow periods that usually occur during the summer months. Flood control measures (levees and floodwalls) have been designed to be set back, away from the creek banks, in order to preserve overhanging riparian vegetation. On Allen Creek, where major modifications are proposed, the project has been designed to realign the channel to preserve the majority of overhanging vegetation on the east bank. The west bank will be planted with herbaceous cover or trees to help mitigate habitat losses. Information from the Biological Survey Report, Appendix H, indicates that this area of channel realignment is composed of flats that provide very little shade to the creek's aquatic life.

4.09 Vegetation - Alternative A, the no-action alternative, and Alternative G, the nonstructural alternative, would not be anticipated to cause any significant impacts to the vegetation within the project area.

Alternative B, the levee and floodwall alternative, would involve the construction of setback levees and some floodwalls (Plate 5). The placement of these structures has been designed so that impacts to riparian vegetation would be minimized. Where riparian vegetation is destroyed, it will be mitigated with plantings intended to help in bank stabilization, creation of riparian stream canopy, and ground cover habitat.

Levee and floodwall construction will inevitably result in the destruction of some herbaceous and woody vegetation by heavy equipment or by covering. These impacts are anticipated to be minor. The levees will be seeded with

grasses and/or legumes to provide stabilization. Additionally, some species of native weed plants would eventually invade these plantings, thereby providing additional vegetative cover and increased stabilization.

Rooted aquatic vegetation does not exist in Allen Creek in the study area and is very sparse in Irondequoit Creek. Only one rooted hydrophytic plant (Sago pondweed (Potomogeton pectinatus)) was found in Irondequoit Creek and, this should not be significantly impacted upon.

4.10 Wildlife - Alternative A, the no-action alternative, and Alternative G, the nonstructural alternative, would not be anticipated to cause any significant impacts to wildlife within the project area.

Alternative B, the levee and floodwall alternative, will impact on terrestrial habitats and wildlife species. The proposed action will probably temporarily displace small mammals and some birds from the project area during actual construction. This impact is anticipated to be minor, and most species should return after construction is completed. Destroyed habitat will be mitigated when all proposed plantings are incorporated into the final design (Reference Section Vegetation Seeding), especially the area west of Allen Creek. Existing conditions in this area are flat and sandy, with no trees and little forb vegetation. Plantings here would allow for increased wildlife habitat and production.

4.11 Threatened and Endangered Species - As stated in Section 3 - Affected Environment - of this Environmental Impact Statement, no protected or endangered species were found within the project area and, therefore, no adverse impacts are expected to be caused by the alternatives.

EFFECTS ON THE HUMAN ENVIRONMENT

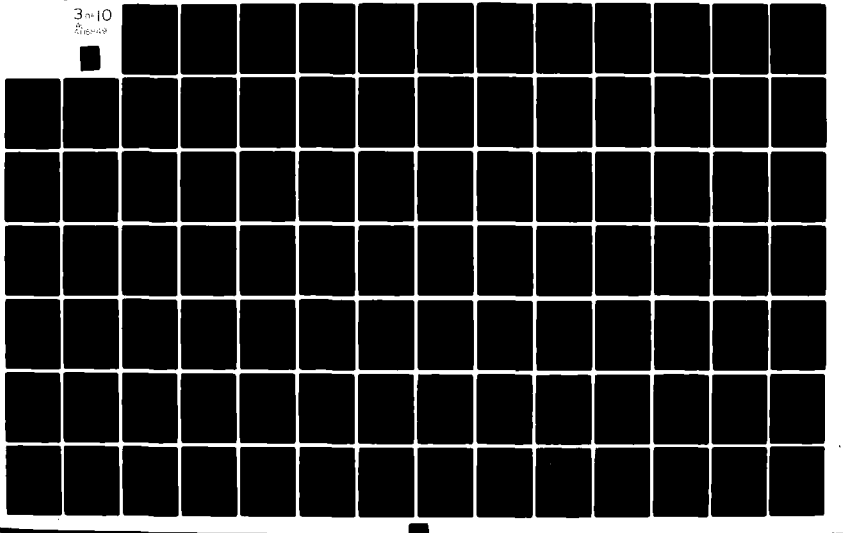
4.12 The existing development within the flood plain in the Panorama Plaza vicinity has been identified as having socioeconomic (human) significance. See Section 3 - Affected Environment - paragraph 3.16 of this EIS. The following items address effects of the Stage 3 considered alternatives to that development. Summary tables of comparative effects and impacts of alternatives are included in Section 2 - Alternatives of this EIS.

4.13 Man-Made Resources - Man-made resources are structures, objects, or sites which have been planned, designed, and constructed by man. These items from a human environment aspect consist primarily of agricultural, residential, commercial, public, recreational, and transportation developments. Such developments which lie within the affected floodprone Panorama Plaza vicinity have been identified in some detail in previous study reports and are summarized in the Affected Environment section of this EIS and in more detail in the main report of the Final Feasibility Study. From the Flood Damage Survey of 1977, which was completed by the Corps of Engineers, a total of 76 commercial businesses, 24 residential, and 5 public utilities may be affected by a flood exceeding a SPF frequency. Economic investigations have determined that estimated average annual damages to these developments (using March 1981 Price Levels) under existing conditions would total $764,040. For details on economic investigation pertaining to damages, alternative benefits and benefit/cost ratios see Appendix B - Economic Evaluation. Also, see the following Section (4.14) for the levels of flood protection.

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL

3 of 10
AD A115849



4.14 Flood Protection - The flood damage reduction measures associated with the no-action alternative would provide very limited protection to the existing well-developed Panorama Plaza vicinity. It is anticipated that future flooding and related damages would continue.

Although further development of existing flood insurance and flood plain management policies (Alternative G - Nonstructural) would limit further extensive development and thus additional potential flood damages, and would provide compensation for flood damage to existing developments, it would do little to provide positive flood damage reduction measures for those existing developments.

The Alternative B (Levee/Floodwall) alternative would provide a positive degree of protection. Although most projects are initially investigated for flood reduction measures for the 100-year event, investigations for the 50-year event, the 500-year event and the Standard Project Flood (SPF), a most severe event, are examined in an effort to provide maximum protection at an acceptable cost. Alternative B is selected to provide flood damage reduction up to the 500-year event. See Appendix B of the main report or paragraph 4.33 of this EIS for details on cost and benefits.

4.15 Cultural Resources - In order to assess the impacts of the proposed project on significant cultural resources, the 18 March 1980 edition of the National Register of Historic Places and all subsequent revisions were consulted. Within the town of Penfield, only one structure, "The Mud House," was listed in or eligible for the National Register, but it is outside the project area. In order to determine if previously undiscovered potentially significant cultural resources were located within the project area, a reconnaissance level survey was performed. The results of that survey were negative. See Section 5, paragraph 5.14 of this EIS.

4.16 Noise - No significant noise effects would occur as a result of implementing Alternatives A (No-action) or G (Nonstructural).

Vehicles and equipment necessary to implement Alternative B (Levee/Floodwall) will generate noise from operating engines, horns, and other sources. Noise impacts will be localized and temporary and could be eliminated by modifying or stopping producing project activities as the situation warrants. Therefore, no significant noise effects will occur.

4.17 Aesthetic Values - The aesthetic quality or value of any setting depends upon the subjective perceptions and value systems of the perceiver. Some normative conclusions about the aesthetic effects of the various project alternatives on the existing setting, however, may be stated as follows:

Presently, the project area is well-developed with light industrial, commercial, and apartment complexes. The structures are in good condition and are generally well-maintained. A large portion of the land area has been filled and blacktopped leaving only a thin band of natural vegetation along portions of both sides of the creek. Evidence of continued backfilling, dumping, and debris exists along the creek banks. This might be expected to continue should the No-action Alternative A be implemented. Continued development of the flood insurance and flood plain management policies

(Alternative G) without structural alternatives, could eventually result in the abandonment of structures which would be unsightly unless demolition practices should be implemented. Eventually, the vicinity would probably return to a natural setting.

In implementation of Alternative Plan B (Levee/Floodwall), during the construction period, normal local aesthetic settings (in the construction area) would be disrupted due to the presence of construction equipment and from the noise, dust, odors, and turbidity caused by construction operations. To minimize these effects, the Contractor will be required to work in accordance with the procedures and regulations outlined in the Civil Works Construction Guide Specification for Environmental Protection (CW-01430, July 1978).

Upon project completion, the implacement of floodwalls, levees, and/or alteration of the present creek environment could have both adverse and beneficial aesthetic aspects. Structural alternatives could have some positive effect to the extent that the project clears unsightly debris and discourages further dumping and destruction of remaining natural vegetation.

The required heights of levees and floodwalls (Alternative Plan B) could block the view of the creek from the surrounding areas and would conflict with the natural flatness of the flood plain terrain. These effects would be mitigated to some degree, however, by keeping the structures as far away from the creek as possible and continuing to use as much area as possible as a natural flood plain. This will decrease the required height of the structures, and leave the existing natural vegetation intact which would generally be more aesthetically pleasing.

Channelization (Allen Creek portion) allows the use of the much smaller levees which would blend into the creek slopes yielding less visual obstruction, but could impact more severely upon the already limited natural setting which is generally considered for its aesthetic value. Channelization in the Panorama Plaza vicinity would also require extensive riprap because of the erosive characteristics of the soils.

Consideration in structural design including: blending of structural aesthetic features to the existing architectural and natural settings, use of gradual slopes and curves, multiple structural functional use and aesthetic revegetations and plantings could mitigate and enhance aesthetic quality in the area.

4.18 Population (Density and Mobility) - In light of the existing degree of development and the affluence of the Panorama Plaza vicinity, it is not anticipated that population density would significantly increase or that desired population mobility would be troublesome. Continued periodic flooding problems might induce population mobility from the area which would decrease population and density.

Continued development of flood insurance and flood plain management policies, Alternative Plan G - Nonstructural, would discourage further land redevelopment in the flood plain area. This would induce a decrease in population density. The flood insurance compensation would provide mobility incentive to redevelop in a less hazardous area.

Flood reduction measures, Alternative Plan B, might encourage increased development within the area and decrease motivations for relocating as a result of flooding problems. This could increase population densities and mobility into the protected area. Due to the existing intensity of the area, however, it is not anticipated that implementation of Alternative Plan B would significantly increase population density or mobility into the project vicinity.

4.19 Displacement or Acquisition - Continued periodic flooding conditions could result in temporary evacuation of people from homes and businesses. Continued significent problems might cause people and businesses to seek relocation.

Continued development of flood insurance and flood plain management policies, Alternative Plan G - Nonstructural, would discourage continued development and redevelopment within designated hazardous areas resulting in gradual displacement of intense developments and acquisition by interests of less damage prone developments.

For structural Alternative Plan B, the State will be required to acquire lands, easements, and rights-of-way for construction and subsequent maintenance of the project. Permanent easements will be required for channelization, levee/floodwall construction, and flowage easements. All construction is to be done within the permanent easement area and no temporary easements will be required. The total land area to be acquired is approximately 22 acres. This land is primarily undeveloped.

A printing business, Harney Printing, is situated on the north bank of Irondequoit Creek just northwest of the Panorama Trail Bridge. It is in close proximity to the creek - approximately 15 feet. The instability of the sandy soils and the continuous erosion process poses a threat to the building's foundation.

Structural Alternative Plan B would require acquisition of the property and relocation of this business. To design and construct a floodwall and erosion protection to protect one building would be very expensive and such a cost would not be incrementally justified. The firm could probably relocate within the vicinity and relocation compensations would be made.

The "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970" provides for the fair market value of the property, moving expenses, plus a supplemental payment to enable the owner to purchase a comparable replacement structure in the general area.

In the modifications along Allen Creek, two small buildings would be moved in Camp Haccamo, a day camp for handicapped children, located behind the Sybron/Nalge property. Moving the buildings would allow sufficient room to construct the levee and to tie it into the existing high ground behind the camp. The buildings currently serve as bunk houses and could be moved to another location on the camp property.

4.20 Community Cohesion - Continued periodic flooding in the Panorama Plaza vicinity could disrupt normal community function including business, services, facilities, and transportation. Continued damages and flooding problems could eventually result in relocations and even restructuring of community elements. This would probably impact adversely upon the community cohesion as it exists today.

Continued development of flood insurance and flood plain management policies, Alternative Plan G - Nonstructural, would gradually result in the redevelopment of the hazardous vicinity to less damage prone developments. This reshuffling of community elements could be thought of as an adverse impact to community cohesion as it exists today, but the gradual reduction of flood damage-related problems would contribute to the community cohesion factors in the long term.

Structural flood damage reduction measures, Alternative Plan B, would better ensure continued community function which might ordinarily be disrupted by flooding problems. It might also provide opportunities for further developments. (This could create conflicts between various interest groups). In light of the extent of the existing developments, however, no long-term development that would disrupt social values and interactions is expected as a result of the structural flood reduction alternative. Project personnel will be transitory and few in number and will not affect present community character or relationships. Community safety and sense of well-being may be enhanced in the immediate project area.

Restriction of vehicular traffic and limitation to pedestrian access at the Plaza Extension Bridge and the Old Penfield Road Bridge and the introduction of levees and floodwalls (barriers) could disrupt established travel patterns or routes which may act as community cohesion factors.

4.21 Desirable Community Growth - Continued flooding conditions in the Panorama Plaza vicinity (Alternative A - No-Action) would continue to inflict damage to the existing developments. Overtime, frequent and significant flooding could generally deter sufficient maintenance and modification to these structures. This in turn would alter land use, property values, etc. The effects on desirable community growth of the no-action alternative would therefore center upon effects to the existing developments.

Future developments in the flood plain area are already limited. First of all, the Panorama Plaza vicinity is already extensively developed. Only 14 acres are identified as undeveloped and 12 of these have already been designated for a proposed park development. The remaining 2 acres would probably remain vacant, due to its small size and poor location for commercial and industrial development. In addition, existing flood insurance and corresponding flood plain management regulations restrict or prohibit new developments in the flood plain. Presently, however, modifications to existing structures is unrestricted and these could still significantly increase flood related damages.

Continued development of flood insurance and flood plain management policies, Alternative Plan G - Nonstructural, would increasingly limit types of future

developments and/or redevelopments in the Panorama Plaza vicinity. These restrictions in some cases are viewed as troublesome to many development interests in their view of desirable community growth. On the other hand, these restrictions would result in avoidance or prevention of significant community growth problems such as improper land use and significant flood damage.

Flood reduction measures (Alternative Plan B) would enhance conditions for the existing developments by preventing extensive damages and ensuring continued community function which might ordinarily be disrupted by flooding problems. Also, these measures generally provide incentive for continued maintenance and improvements to existing structures.

Recreational developments consisting of ballfields and picnic facilities have been proposed for the area along the creek and behind the plaza in the Panorama Plaza vicinity. Structural flood damage reduction alternatives have been and will continue to be coordinated with town officials so that plans will not conflict, but compliment each other. With the Alternative Plan B - Levee/Floodwall alternative, the proposed levees would be set back from the creek to provide room for the recreational development. This area would act as a permanent flood plain and would incur only minimal damages.

4.22 Institutional Relationships - Implementation of the without condition (no-action) alternative would require that flood damage reduction measures be implemented through private or governmental institutions other than through this project. This is discussed in greater detail in the "Without Conditions - No Action" subsection of Section 2 - Alternatives - of this draft Environmental Impact Statement.

Implementation of Alternative Plan G, the nonstructural alternative, (Flood Insurance and Flood Plain Management) would require significant reorganization and cooperation between and within the various levels of governmental planning agencies. See Alternative G in the Alternatives Considered Further section of the main report of the Final Feasibility Study.

The primary effect on the formal institutional relationships concerned with the vicinity, should Alternative Plan B, the Levee/Floodwall alternative, be enacted, would be implementation and sustainment of non-Federal requirements. These are discussed in greater detail in the "Implementation and Responsibilities" section of the main report.

Alternative B, the Levee/Floodwall alternative, would require the acquisition of property and the relocation of the Harney Printing business. This could have a slight adverse impact to the informal institutional relationships in the vicinity. (See 4.19, Displacement of People.)

4.23 Health and Safety - It is anticipated that flooding of similar or even greater magnitude could and in all probability would occur in the Panorama Plaza vicinity should no flood reduction measures be implemented. Health and safety hazards associated with flooding conditions would continue to occur. Depending upon the degree of flooding, periodic assistance from police, fire-rescue, health and utility services would be required.

Continued development of flood insurance and flood plain management policies, Alternative Plan B - Nonstructural, would eventually result in less damage prone developments within hazardous areas, which in turn would result in a safe, less hazardous environment. This, however, would be long range and would do little for existing conditions.

Flood reduction measures, Alternative B - Levee/Floodwalls, would provide varying degrees of protection from flooding and related hazards and would alleviate the need for emergency assistance that might ordinarily be requested. In addition, flood reduction measures would induce a sense of security and well-being to the inhabitants of the area.

Construction of structural flood reduction measures would induce hazards associated with said construction practices. These hazards however would be relatively short in duration and measures would be taken to minimize any danger. This would include construction site hazards, movement of equipment, and air and water quality impacts.

4.24 Leisure Opportunities (Recreation) - The immediate Panorama Plaza vicinity is not known to be heavily utilized as a fishing area. Various sections downstream and particularly upstream of the area are known to be utilized, however. With improving water quality and fisheries resources that exist, it is anticipated that related recreational activities could increase in the plaza vicinity.

Continued development of flood insurance and flood plain management policies, Alternative Plan G - Nonstructural, would encourage open or recreational type developments which are significantly less hazard and/or flood damage prone. The town of Penfield is presently developing plans for a park and ballfield development to be located in the available area between the creek and the plaza. This plan consists primarily of a baseball diamond, several multi-purpose playing fields, a small playground and some picnic facilities. See the Recreational Development section of the main report of the Final Feasibility Study.

Mitigation measures incorporated into Alternative B, the Levee/Floodwall alternative, would act to preserve the fisheries and wildlife resources in the area and potential for their recreational use would therefore be greater.

Coordination efforts will be made so that aspects of structural flood reduction measures may be incorporated into and contribute to planned recreational developments. The levee would isolate the park to promote a safer environment from plaza traffic. Appropriate maintenance/pedestrian access facilities (gate, ramps) however, will be provided to the vicinity. Utilization of the levee for recreational purposes (hiking/biking trail, bleachers) was considered during plan formulation and in the draft reports. However, because of continuing significant concerns pertaining to health and safety problems, maintenance problems/costs, and structural integrity concerns, this utilization will not be incorporated or encouraged in the final plans.

4.25 Land Use - The Panorama Plaza vicinity is already extensively developed as commercial (84 acres), light industrial (24 acres) and residential (23

acres). (See the Section on Land Use in Appendix B.) Of the approximate 14 acres of vacant land that could be developed, 12 have been designated for a proposed town park. (See the Section on Recreational Development in the main report.) In addition, flood insurance and corresponding flood plain regulations, restrict future types of developments in the flood plain area. It is therefore anticipated that the land use in the Panorama Plaza vicinity will remain largely as it is, or will gradually convert to lesser flood damage prone uses.

Continued development of flood insurance and flood plain management policies (Alternative Plan G, Nonstructural) would further restrict development and redevelopment in the flood plain. These policies would encourage less flood damage prone land uses such as agricultural, recreational or open space.

Alternative Plan B, the Levee Floodwall Plan, would provide structural flood damage reduction measures for the existing developments within the project area. Although construction of the required levees and floodwall would require acquisition of approximately 22 acres of land, this would not sufficiently alter the existing or proposed land use patterns. The proposed park would be incorporated into this plan and would be utilized as a low damage temporary flood plain area. It too, is probable that the measures would increase pressures for further and more intense development. However, again, because of the extent of the existing developments and because of the increased restrictions on further types of developments, as stated previously, it is anticipated that implementation of Alternative B would primarily stabilize land use in the project area.

4.26 Facilities and Services - Continued flooding conditions would periodically disrupt community facility services and require the services of police, fire, ambulance, and assorted other service agencies needed in times of flooding.

Continued development of nonstructural policies, flood insurance and flood plain management, Alternative Plan G, would probably have little immediate impact to community facilities and services. Compensation for services or damages might be claimed through insurance policies. The restriction of damageable developments and/or redevelopments might eventually alleviate facility and service problems associated with flooding.

In light of the adequacy of public facilities and services in the project area, no significant or overburdening impacts are expected as a result of project construction or implementation (Alternative Plan B).

Project construction may require the relocation and/or modification to some existing facilities. The sewer interceptor line may have to be modified and waterproofed in some areas. Telephone poles, and some utility lines may have to be relocated (repositioned). Resulting disruptions would be temporary in nature.

Police, fire, and ambulance services should not be significantly hindered. Police traffic regulation services may be required at times. Access to secondary raods may be limited at times but primary roads would remain open.

4.27 Transportation - Continued periodic flooding could temporarily inundate roads that traverse the area particularly in the vicinity of the Plaza Extension Bridge and the Old Penfield Road Bridge.

During the construction period, (Alternative Plan B - Levee/Floodwall), movement of construction equipment would increase traffic volume, congestion, and limit access in some areas. Access to secondary roads may be limited at times but primary roads would remain open.

Implementation of Alternative Plan B - Levee/Floodwall would not require the removal of the Plaza Extension Bridge or the Old Penfield Road Bridge. Vehicular traffic would be discontinued over the Plaza Extension Bridge. A pedestrian gate, however, would be installed in the floodwall along the left bank at the Plaza Extension Bridge allowing pedestrian access to the bridge, park, and plaza. Pedestrian access ways would be provided over the levee on the plaza side of the bridge also. Vehicular access over the levee will be provided only for maintenance purposes. Draft reports provide for the old Penfield Road Bridge to remain with pedestrian access only. Further consideration however, will be given to the feasibility/possibility that vehicular traffic would be maintained under normal (non-flood) conditions but would be temporarily detoured during flood conditions. The details of this will be determined in development of detailed plans and specifications. Adequate alternative access routes are available for any alternative.

Alternative Plan B also requires that a several hundred-foot section of the Genesee Conservation League entrance road be elevated and reconstructed to serve as part of the levee system. This would temporarily limit access in this area. A temporary alternative access route would be used during the modification period. Two-way traffic along the reconstructed road will be a design criteria during the final design phase.

4.28 Property Values and Tax Revenues - Improvements to developments within the Panorama Plaza vicinity would probably increase property values and available tax revenues. Continued significant flooding problems and damages would have a reverse effect.

Continued development of flood insurance and flood plain management policies, Alternative Plan G, Nonstructural, would limit types of development and/or redevelopment in the flood plain. This limitation would probably lower property values and available tax revenues.

With implementation of Alternative Plan B, the Levee/Floodwall alternative, however, the market value of homes and businesses currently subject to flooding in the project area may well be enhanced by the provision of flood protection. Property tax revenues may in turn be increased if affected properties are thus reevaluated.

4.29 Desirable Regional Growth - The variety of developments within the Panorama Plaza vicinity, including: apartment complexes, stores, businesses, restaurants, light industries, primary transportation routes, and proposed recreational developments, provide some opportunity for regional population and economic growth or sustenance. Continued flooding problems within the

vicinity could disrupt normal community and business activities which in turn could, to some extent, adversely draw upon new or continued opportunities for desirable regional growth.

Continued development of flood insurance and flood plain management policies (Alternative Plan G, Nonstructural) would limit developments and/or redevelopments in flood plain areas. This would further limit the availability of development land and increase pressures for development in the continually growing Rochester region. In the long term, however, these policies would avoid future flooding and many environmental problems.

By providing structural flood damage reduction measures (Alternative Plan B - Levee/Floodwall) that provide a reasonable degree of protection to the normal community functions in the Panorama Plaza vicinity and mitigate or enhance existing natural environmental conditions, it contributes to the desirable regional growth.

4.30 Employment and Labor Force - Continued flooding problems within the vicinity could eventually indirectly affect employment opportunities within the plaza vicinity should businesses and developments seek relocation due to continued flood damage.

Should Alternative Plan B be implemented, temporary employment for a small labor force will be required for project construction, and some local employment opportunities may occur, depending upon the Contractor.

Although no significant long-term effects upon local labor are expected, proposed and induced continued development improvements (as a result of flood damage reduction measures) may provide additional employment opportunities.

4.31 Business and Industrial Activity - Continued flooding conditions could disrupt normal business and industrial activities, resulting in lost business time and transactions. Damage to property and loss of inventories would also result.

Continued development of flood insurance and flood plain management policies, Alternative Plan G, Nonstructural, would provide compensation for flood damage losses and would limit damageable developments and/or redevelopments.

With implementation of Alternative Plan B, the Levee/Floodwall alternative, local businesses would benefit from minor purchases of some project materials and purchases of personal goods and services by project workers. Long-term positive impacts would include reduction in flood-related damages to business inventories and property, and reduction in lost business transactions due to flooding.

4.32 Displacement of Farms - No displacement of farms will occur as a result of this project.

ADDITIONAL ITEMS OF CONCERN

4.33 Plan Economics - Primary investigations of plan economics include determination of benefits and costs incurred through plan implementation. Benefit categories include flood damage reduction and possible intensification of commercial activities. Average annual damages were developed based on stage frequency relationships and stage damage information. Benefits are the differences between average annual damages with or without the project including affluence benefits. Total Federal costs for the alternatives include costs for channelization, berms, levees, floodwalls, bank protection, and interior drainage. The total Non-Federal costs are comprised of costs of utilities relocation, and permanent land acquisition. The ratio of the average annual benefits and average annual cost known as the B/C ratio, is an indicator of economic efficiency and project justification.

Comparative costs, B/C ratios, and net benefits are listed as follows:

(500-year level of protection) (March 1981 Price Levels)

Alternative	No-Action	G	B
			$
Total Project Cost	0	N/A	4,900,000
Average Annual Costs	0	N/A	456,700
Average Annual Benefits	0	N/A	743,190
B/C Ratio	N/A	N/A	1.63
Net Average Annual Benefits	0	N/A	286,490

For more details on economic studies see Appendix B of the main report of the Final Feasibility Study.

4.34 Several interested parties expressed their concern for potential effects of alternative project plans to institutions or resources downstream of the Panorama Plaza vicinity. These items of significant concern are listed and addressed as follows:

4.35 Genesee Conservation Club - Past flooding and damage survey reports do not indicate significant damages to the Genesee Conservation Club facilities. Although the caretaker's house may encounter some flood damage during a 100-year event, and the access road and lowland area (lower than El. 268.8) adjacent to the creek would be flooded, the main clubhouse would not encounter any damage because the first floor elevation (270.22) is above the 500-year stage elevation (270.1).

No flood control structures have been proposed in this downstream reach for the Alternative Plan B - Levee/Floodwall plan for reasons mentioned in the previous paragraph and because it would not be economically justifiable to build a levee to prevent minor damage to one house. Structural floodproofing is recommended for structures in this reach with this plan.

4.36 Quarry Lake - Dolomite Products Company owns approximately 170 acres of land north of Old Penfield Road, of which nearly 100 acres are open areas which have been or will be involved in the mining process. The acquisition of the sand and gravel is made by dredging the resources from the pond which presently encompasses 49 acres. Processing operations are made from an area encompassing approximately 12 acres just west of the pond. The proposed 5-year design by Dolomite for the plant is that the pond will be enlarged to 60 acres and that proposed surface mining operations will involve an additional 22 acres.

This mining operation involves the dredging of approximately 300,000 tons of sand and gravel each year from depths of 70-80 feet in the pond. Dewatering, crushing and classification of the minerals are operations undertaken to prepare the resources for use. After preparation, the minerals are either sold and removed from the site by the 200 trucks which leave the site daily, stockpiled for future use or processed. Onsite processing involves a transit mix concrete plant as well as a central mix concrete plant which is currently under construction. Sufficient resources are available to operate the plant for about 20 more years, depending on the demand for the minerals. At the present time, 10 persons are employed at the plant.

The natural drainage pattern for the majority of the vicinity southwest and northwest of the pond is into the pond itself and then eventually into Irondequoit Creek. On the west side of the hill located to the west of the pond, drainage is into teriary drainage divides which run north to Irondequoit Creek. The remainder of the vicinity to the southeast and east of the pond drains directly into Irondequoit Creek.

The pond and surrounding area of the Redman Plant offer a considerable degree of storage during periods of high flow in Irondequoit Creek. Under stream flooding conditions, Irondequoit Creek begins to overtop its west banks to the east of the pond at elevation 260 and spread out into the pond and excavation area. At a water surface elevation of 260 feet approximately 158 acre-feet of storage are provided by the mining operation. Additional storage will be provided as the pond is expanded. The storage capacity of the mining operation as the area is excavated will increase to approximately 220 acre-feet.

Implementation of the Alternative B - Levee/Floodwall plan would slightly increase the high flows through the lake. These increased flows of relatively short duration would have little significant impact to the lake levels or to the existing quarry operations. It is important that this existing weir action be maintained in order to assure the effectiveness of the Alternative Plan B flood reduction measures. A drainage easement is therefore required along this reach.

4.37 Ellison Park, Downstream Wetlands, Irondequoit Bay - It is not anticipated that any of the alternative plans would significantly impact upon these resources. Primary concerns relate to adverse impacts to water quality during the construction period due primarily to introduction of increased sediments and construction-related pollutants. These effects would be mitigated through environmentally protective construction procedures. It is anticipated that any alteration of flows, velocities, and sedimentations will dissipate to existing conditions before reaching these resources.

SECTION 5

PUBLIC INVOLVEMENT

PUBLIC INVOLVEMENT PROGRAM

5.01 The principal means of coordination between the Buffalo District Corps of Engineers and the local interests on the Irondequoit Creek study has been through a planned series of public meetings and workshops. Public meetings were scheduled in accordance to ER 1105-2-800. At these meetings, Corps investigations and findings were summarized, and input from interested and concerned parties were solicited. In addition to these general meetings, several workshop and/or planning meetings were initiated, as needed, to deal with more specific problems and issues. Written and telephone correspondence with concerned agencies and individuals has also contributed to this public involvement program. For further details, see the Public Involvement section of the main report.

5.02 Study emphasis and scope has shifted widely during the Irondequoit Creek investigation. Preliminary concerns had focused on the need for watershed management and in identifying flooding and erosion problem areas. See Problems and Needs section of the main report.

5.03 The Corps examined several existing and past watershed management efforts and suggested the possibility of implementing a new land use and development program/study (SAM). The program, however, did not receive the public support necessary for its implementation. Existing and other future programs/policies therefore, remain to provide guidance in future watershed management. The Corps identified the Monroe County agency responsible for implementing New York State's 208 program as a likely entity to act as a central body for future coordination; although a number of other agencies/ programs exist that could contribute and provide guidance in various aspects of watershed management. See the Summary in this EIS.

5.04 Of the initially identified flooding and erosion problem areas, structural protection for the Panorama Plaza location was the only area found to be economically feasible. Several alternative protection measures were initially considered. Through progression of the Corps planning process, together with input obtained from the public involvement and coordination programs, a preferred alternative was developed.

5.05 Because the Panorama Plaza vicinity is developed primarily with commercial, light industrial, apartment residential and recreational complexes, participants at the public meeting and workshops consisted primarily of representatives of those institutions and various town, county, State, and Federal agency representatives. Town and institutional representatives were primarily concerned with adequate flood damage reduction measures for the vicinity, at a reasonable cost, and with the least amount of adverse impact to community resources and resources downstream. Environmental institutions and agencies meanwhile, were primarily interested in the preservation and even enhancement of environmental resources.

5.06 For further details, see the Public Involvement Section of the main report.

REQUIRED COORDINATION

5.07 Coordination with Fish and Wildlife Resource Agencies. Compliance with the Fish and Wildlife Coordination Act, as amended, 16 USC 661 et. seq., and Endangered Species Act of 1973, as amended, 16 USC 1531 et. seq. - These two laws require coordination with the Fish and Wildlife Service and the appropriate State Fish and Wildlife agency on matters of fish and wildlife resources and project effects on species protected by the Endangered Species Act. Throughout the course of the current Irondequoit Creek study, extensive coordination has been maintained with the Cortland field office of the U. S. Fish and Wildlife Service (USF&WS) and the Region 8, Avon, NY, Office of the New York State Department of Environmental Conservation (NYSDEC). Representatives of both the Fish and Wildlife Service and NYSDEC attended most of the public meetings of the Irondequoit Creek study.

5.08 Several planning conferences between the Fish and Wildlife Service, NYSDEC, and the Corps of Engineers representatives have occurred relative to the study. On 29 March 1979, representatives of the Buffalo District (COE) and of the Cortland field office of USF&WS held a joint field trip to the Panorama Plaza vicinity. The purpose of the trip was to further delineate biological studies for the Irondequoit Creek Flood Control Study area. A joint scope of work for the needed biological studies was developed by both agencies and commenced in late fall of 1979. A preliminary report of biological study findings on this scope of work was sent to the Buffalo District by Dr. Andrew M. White, Environmental Resources Associates, Inc., in his letter dated 8 February 1980. A final report followed 11 July 1980. On 20 February 1980, representatives of the Buffalo District (COE) met in Cortland, NY, with representatives of the USF&WS and NYSDEC. At this meeting, various considered alternatives were presented, environmental concerns were discussed, and more comparable alternative measures were developed. A similar meeting (field trip) occurred on 8 May 1980, to discuss proposed alternatives along Allen Creek. In addition to these meetings, numerous telephone and written communications were transacted. On 15, 30 April meetings were held between NYSDEC (Albany), NYSDEC (Avon), NYSDEC (Cortland), and Corps representatives to discuss items of local cooperation and maintenance.

5.09 The U. S. Fish and Wildlife Service has provided comments regarding the Buffalo District (COE) Draft Plan of Study in a planning aid letter dated 9 February 1977, comments on the proposed scope of work for biological studies in a letter dated 27 April 1979, a 1 June 1979 planning aid letter dealing with concerns relating to proposed structural alternatives for the Panorama Plaza area, a letter of comments relative to the Preliminary Feasibility Report dated 13 September 1979, and a planning aid letter relative to proposed alternatives along Allen Creek, dated 19 May 1980. USF&WS have also reviewed alternative plans considered in Stage 3 planning and provided comments in the Draft Coordination Act Report dated 2 September 1980, and the Final Coordination Act Report dated 1 December 1980.

5.10 Compliance with Executive Order 11990, Protection of Wetlands, 24 May 1977. This Executive Order requires that Federal agencies avoid development in wetlands unless no practicable alternative to such development exists.

None of the preferred plans for Irondequoit Creek involve development in wetlands and this Executive Order is complied with for the Irondequoit Creek study.

5.11 Compliance with Executive Order 11988, Flood Plain Management, 24 May 1977. This Executive Order requires that Federal agencies avoid development in base flood plains unless no practicable alternative to such development exists. It is the policy of the Corps of Engineers to formulate projects which, to the extent possible, avoid or minimize adverse impacts associated with use of the base flood plain and avoid inducing development in the base flood plain, unless there is no practicable alternative. The decision on whether a practicable alternative exists will be based on weighing the advantages and disadvantages of flood plain sites and nonflood plain sites. Factors to be taken into consideration include, but are not limited to, conservation, economics, aesthetics, nature and beneficial values served by flood plains, impact of floods on human safety, locational advantage, the functional need for locating the development in the flood plain, historical values, fish and wildlife habitat values, endangered and threatened species, Federal and State designations of wild and scenic rivers, refuges, and in general, the needs and welfare of the people. The Irondequoit Creek flood protection alternatives are structural but have been determined to be the only practicable alternatives. Flood Plain Management policies have been enacted for the area. This Executive Order is complied with for the Irondequoit Creek study.

5.12 Analysis of Impacts on Prime and Unique Farmlands, CEQ Memorandum, 30 August 1976. This memorandum requires that an analysis be made of the effects of a proposed plan on prime and unique farmlands be made in an EIS. The preferred plans for Irondequoit Creek do not affect prime and unique farmlands in any manner, and this memorandum is complied with for the study.

5.13 Compliance with the Clean Water Act of 1977, 33 USC 1251 et. seq. The Clean Water Act requires that the effects of the placement of dredged or fill materials into the waters of the United States be evaluated and include consideration of the Section 404(b)(1) guidelines as described in the Act. The inclusion of the consideration and evaluation in this EIS and the submission of the EIS to Congress will be accomplished pursuant to Section 404(r) of the Clean Water Act. This procedure exempts the discharge from regulation under Sections 301, 402, and 404 of the Act. An assessment and Section 404 evaluation has been prepared and will be fully coordinated with appropriate agencies and individuals. The 404 evaluation is included in Appendix H.

5.14 Cultural Resources. The requirements for identification and administration of cultural resource are contained in various Federal laws, Executive Orders, and Guidelines. In accordance with the mandates of this legislation, a cultural resources reconnaissance survey was undertaken in the environmental impact area of the project. The study revealed that the project will not affect significant cultural resources. Concurrence to this statement is verified by a letter from the New York State Historic Preservation Officer (SHPO) dated 15 April 1980, and by a Telephone Conversation Record dated 12 May 1980. Copies of these are contained in Appendix G.

PUBLIC VIEWS (Prior to Release of the DFFR and DEIS)

5.15 The views of local interests in the Irondequoit Creek area, as expressed through the public involvement and coordination programs previously addressed, were relied on extensively during the study planning process. The following is a short summary of primary views expressed by the various Federal and Non-Federal interest groups.

5.16 Views of Other Federal Agencies. The United States Department of the Interior Fish and Wildlife Service expressed concern for the water quality in the Irondequoit Creek Watershed. The Fish and Wildlife Service stated that "any development within the Irondequoit Creek Watershed must not in any way degrade existing or future water quality conditions. Any plan developed must address the important fishery and wildlife resources within the project site."

5.17 In the Panorama Plaza vicinity, the USF&WS preferred Alternative B, the levee/floodwall plan of the feasible structural alternatives, because it would have considerably fewer adverse environmental impacts upon the natural environment.

5.18 Views of Non-Federal Interests. All coordinating agencies and levels of Government were in favor of the Buffalo District, Army Corps of Engineers, study of Irondequoit Creek and its tributaries for flood control. The Monroe County Department of Planning suggested that "the Corps should work from the policy premise that Irondequoit Creek and its tributaries are natural stream bodies that should remain that way." Some development has been allowed to occur in floodprone areas in isolated sections so that the flooding problems are fairly localized and most of the stream corridor remains in a near-natural state.

5.19 The New York State Department of Conservation (NYSDEC) supports the nonstructural measures as being most effective in preserving the integrity of the watershed. The NYSDEC also stated that "it appears that the application of nonstructural measures to alleviate flood problems may have a positive impact on natural resources. Action in this direction at this time could minimize the need for structural measures at a later date. It is recommended that this approach to the problem be pursued without delay."

5.20 NYSDEC expressed concern that "a structural plan for levees and channelization of Irondequoit Creek in the Panorama Plaza area must take into consideration the fact that this reach of stream is utilized during the spring by anadromous rainbow trout from Lake Ontario as a passage to higher quality waters upstream. Channelization of this section will negate gains made by the forthcoming sewage diversion. Wide shallow channels will promote summer ambient temperatures that exceed the upper lethal limit to support brown trout and rainbow trout."

5.21 In the Panorama Plaza vicinity, local interests were primarily concerned with positive flood damage reduction measures at a reasonable cost with minimal adverse impacts to existing resources. Alternative B - Levee/Floodwall has been identified as the most economical and least environmentally damaging alternative and appears to best satisfy the local interests.

STATEMENT RECIPIENTS

5.22 The following agencies, groups, and individuals were sent copies of the Draft Final Feasibility Report and Draft Environmental Impact Statement for review and comment.

Federal

Advisory Council on Historic Preservation
American Rivers Conservation Council
Defense Technical Information Center
Federal Emergency Management Agency
Federal Energy Administration
Federal Energy Regulation Commission
U. S. Department of Agriculture
U. S. Department of Commerce
U. S. Department of Energy
U. S. Department of Health, Education, and Welfare
U. S. Department of Housing and Urban Development
U. S. Department of Interior
U. S. Department of Transportation (UMTA)
U. S. Environmental Protection Agency
Water Resources Council

State

Office of the State Archeologist
NYS Department of Commerce
NYS Department of Environmental Conservation
NYS Department of Health
NYS Department of State
NYS Department of Transportation
NYS Office of Parks and Recreation
NYS Office of Planning Services
State Clearinghouse Administrator
State Historic Preservation Officer

Legislature

NYS Governor Hugh L. Carey
U. S. Senator Jacob K. Javits
U. S. Senator Daniel P. Moynihan
U. S. Congressman B. B. Conable, Jr.
U. S. Congressman Frank Horton
U. S. Congressman Gary A. Lee
State Senator John D. Perry
State Senator Fredrick L. Warder
State Assemblyman Audre T. Cooke
State Assemblyman James F. Nagle

Others

Monroe County
Ontario County
Wayne County
Genesee Finger Lakes Regional Planning Council

Town of Brighton
Town of Henrietta
Town of Irondequoit
Town of Macedon
Town of Mendon
Town of Penfield
Town of Perinton
Town of Pittsford
Town of Victor
Town of West Bloomfield

City of Rochester

Village of East Rochester
Village of Fairport
Village of Pittsford

Genesee Conservation League
League of Women Voters/Rochester
The Link-Center for Environmental Information
Sierra Club of Rochester
Trout Unlimited

Cornell University
SUNY at Buffalo
Rochester University

A complete mailing list is on file at the U. S. Army Corps of Engineers, Buffalo District Office.

REVIEW OF THE DRAFT FFR AND DEIS

5.23 Filing of the DEIS. The Draft Final Feasibility Report and Draft Environmental Impact Statement were mailed to all known interested Federal, State, and local agencies as well as interested locals in February 1981. At the same time, the reports were filed with the U. S. Environmental Protection Agency, commencing the 45-day official National Environmental Policy Act (NEPA) review period. The review period extended from 13 February 1981 to 30 April 1981. Copies of all comment letters on the draft reports with corresponding Corps responses are included in Appendix I of the Final Report Appendices.

5.24 Public Meeting. A public meeting was held on 29 April 1981 to discuss the draft reports and to hear the views of the public on the various plans presented as preferred. The results of the public meeting are discussed in the Study Participation and Coordination section of the Final Feasibility Report.

5.25 Public Views Since Release of the Draft Final Feasibility Report and Draft Environmental Impact Statement. Many interests emphasized that watershed management policies/programs are an important issue and will continue to be an important issue in future watershed development. The desirability of improved coordination efforts in this respect was also expressed. Some viewed watershed alternatives (a series of reservoirs or diversion channels) as being more desirable or possibly more beneficial. However, these were determined to be nonfeasible under the study authority because they failed to significantly satisfy the major objective of flood damage reduction, and were determined to be non-cost effective. Watershed management is recommended to be implemented by the non-Federals. Most interests agreed that protection was desirable in the Panorama Plaza vicinity. Most aspects of the plan design were generally acceptable although specific modifications, details, and mitigation measures will need to be worked out in development of Detailed Plans and Specifications. The most pressing concern pertained to project costs and development of an equitable cost-sharing program.

REFERENCES

Bannister, Thomas T. and Bubeck, Robert C., Limnology of Irondequoit Bay, Monroe County, New York, for New York State Department of Environmental Conservation. University of Rochester. Revision: 1 August 1976.

Erdman, Anthony Associates, P.C.; Dolomite Products Company, Inc., Redman Sand Plant, Environmental Impact Statement and Report, 1980.

McPhee, Smith, Rosenstein Engineer, P.C. Summary Report for the Irondequoit Creek Study: Monroe, Ontario, Wayne Counties, New York, for the U. S. Army Corps of Engineers, Buffalo District. April 1978.

Minutes: Public Meeting, Irondequoit Study - Monday, 14 June 1976

Public Workshop - 24 August 1976
Public Meeting - 28 April 1977
Public Workshop - 30 November 1977
Public Workshop - 16 March 1978
Public Workshop - 28 September 1978
Public Meeting - 29 April 1981

New York State Department of Environmental Conservation conference minutes and coordination letters.

Record of Public Hearing on Irondequoit Creek, New York. 12 May 1967.

Thompson, Katherine Wilcox, Penfields Past: 1810-1960. The Town of Penfield, New York. 1960.

Thorne, James and others. The Irondequoit Creek System: A Drainage Basin Before Sewage Diversion. University of Rochester. Summer 1972.

U. S. Army Corps of Engineers, Buffalo District. "Environmental Assessment," Irondequoit Creek Watershed, Preliminary Feasibility Report. July 1979.

U. S. Army Corps of Engineers, Buffalo District. Flood Plain Information: Irondequoit Creek, Monroe and Ontario Counties, New York, prepared for the New York State Department of Environmental Conservation. February 1975.

U. S. Army Corps of Engineers, Buffalo District. Irondequoit Creek Watershed, Preliminary Feasibility Report. July 1979.

U. S. Army Corps of Engineers, Buffalo District. Plan of Study, Irondequoit Creek, New York, and Tributaries Including Allen Creek, for Flood Control and Allied Purposes. Revised September 1976.

U. S. Fish and Wildlife. Conference and coordination letters.

White, Dr. Andrew M., Biological Studies on Irondequoit Creek, New York: Preliminary Findings. Environmental Resource Associates, Inc. 8 February 1980.

White, Dr. Andrew M., Biological Studies of Irondequoit and Allen Creeks in Penfield, New York, 1979-1980, Environmental Resource Association, University Heights, Ohio, 1980.

IRONDEQUOIT CREEK

FINAL FEASIBILITY REPORT
and
ENVIRONMENTAL STATEMENT

INDEX

Subject	EIS	FFR	Appendices
Aesthetics	12,36	6	H
Affected Environment	27	14,100	H
Air Quality	32	104	H
Alternatives			
Alternative A - No Action	17	48,81	
Alternative B - Levee/Floodwall	20	48,83,96	A,B,C,D,E
Alternative C - Channel/Berm	15,19	49	
Alternative D - Channelization	-	51	
Alternative E - Diversion Channel	-	51	
Alternative F - Reservoirs	-	52	
Alternative G - Nonstructural	15,19	52,93	
Alternatives Evaluation	-	93	
Aquatic Biology	32		H
Aquatic Vegetation	32	103	H
Authorized Project	10	2	
Benefit/Cost Ratio	25,45	109	B
Benthos	32		H
Berms	15	49	
Bridges, Access	24,43	81,107	
Business/Industrial Activity	44	105	
Channelization	15,20,49	49,100	H
Clean Water Act	49		
Community Cohesion	39	94	B
Community Growth	39	19	B
Comparative Impacts of Plans	22	94	
Conclusion	3	122	
Construction Costs	25,45	109,110	A
Construction Impacts	22,31	100-108	
Controversy, Areas of	5,47,52		
Coordination	48	2,118	F, G
Correspondence	47	118	F, G
Cost Sharing	45	115	
Cultural Resources	36,49	14,104	
Displacement of Farms	45	94	
Displacement of People	38	94,104	
DEIS - Abstract	1		
DEIS - Comment Data	52		
DEIS - Contact	1		
DEIS - Cooperating Agency	1		

INDEX (Cont'd)

Subject	EIS	FFR	Appendices
DEIS - Cover Page	1		
DEIS - List of Preparers	2		
DEIS - Recipients	51		
DEIS - Responsible Agency	1		
DEIS - Summary	3		
DEIS - Table of Contents	7-9		
Dredged Material	49		A,H
Economic Analysis	22,45	109-112	B
Endangered Species	35	94	H
Environmental Conditions	27-29	6-14	H
Environmental Quality (EQ)	13,21	44,95	
Erosion	20	23,96,105	
Executive Orders	48-49	116	
Fish and Wildlife Coordination	48	118	
Fisheries	33	102	H
Flooding	10,36	33-39	
Geology	-	9,105	E
Habitat Development	33-34	101	
Institutional Analysis	5,40	69-74	
Levees	20	83,96,106	D,E
Local Assurances	12,45,48		G
National Economic Development Plan (NED)	13,21	44,93	B
No Action, Impacts of	17	80	
Noise Impacts	36	94	
Nonstructural	15,19	61,74,83,92	
Objectives, National	13	44	
Objectives, Planning	13	45	
Operation & Maintenance	20,45	108	A,D
Plan Eliminated From Further Study	15	48,51,52	
Plans Considered Further	19	80,92	
Plan Implementation	21,45	116	
Plan Responsibilities	45	113	
Plan Selection	20	96	

INDEX (Cont'd)

Subject	EIS	FFR	Appendices
Population	37	17,18	B
Problem Identification	10	22	
Property Values	43	104	B
Public Concerns	10,47,52	1,118	G
Public Facilities	35,42	58,94	
Public Involvement	47	2	
Public Services	42	94	
Public Utilities	42	106	A,D
Public Views	50	2	G
Real Estate	38	104,107	
Recreation	41	58,104	
Recommendation	22	123	
Section 404	5,49		H
Sedimentation	32,49	105	E
Sediment Quality	49		E,H
Selected Plan	1,3,22	96	B
Significant Resources	22	10-13	
Social Well-being	12	47,94	
State Coordination	47	118	
Study Area	1,27	6	B
System of Accounts	13,22	94	
Table of Contents	7-9	ii,vi	
Tax Revenues	43	94	
Terrestrial Vegetation	34	102	H
Topography	31	6	
Transportation	43	20,106	
Upland Disposal	5,49		H
Vicinity Map	-	7,8,180	
Watershed Management	2,5,11	67,79	
Water Quality	12,32	10,100,40	H
Wetlands	32	103	H
Wildlife	35	101	H

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX A
COST ESTIMATES

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

APPENDIX A

COST ESTIMATES

TABLE OF CONTENTS

Paragraph	Description	Page
A1	Introduction	A-1
A2	Cost Estimate	A-1
A2.1	General	A-1
A2.2	Unit Costs	A-1
A3	Types of Improvement	A-1
A3.1	Levees	A-1
A3.2	Floodwalls	A-5
A4	Associated Costs	A-6
A4.1	General	A-6
A4.2	Interior Drainage	A-6
A4.3	Land and Property Acquisition	A-7
A4.4	New Pavement	A-8
A4.5	Utilities	A-8
A4.6	Channels and Erosion Protection	A-9
A4.7	Flood Warning System	A-9
A5	Maintenance	A-10
A6	Summary	A-10

TABLES

Number	Title	Page
A1	Unit Costs	A-2
A2	Levee Unit Costs	A-3
A3	Floodwall ("I"-Wall) Unit Costs	A-4
A4	New Pavement	A-9
A5	Utility Relocation	A-9
A6	Channels and Riprap Costs - Irondequoit Creek	A-11
A7	Channels and Riprap Costs - Allen Creek	A-12
A8	Levee Construction Amounts - 50-Year	A-13
A9	Floodwall ("I"-Wall) Construction Amounts - 50-Year	A-15
A10	Construction and First Cost - 50-Year	A-16
A11	Average Annual Cost - 50-Year	A-17
A12	Levee Construction Amounts - 100-Year	A-18
A13	Floodwall ("I"-Wall) Construction Amounts - 100-Year	A-20
A14	Construction and First Cost - 100-Year	A-21
A15	Average Annual Cost - 100-Year	A-22
A16	Levee Construction Amounts - 500-Year	A-23
A17	Floodwall ("I"-Wall) Construction Amounts - 500-Year	A-25

TABLE OF CONTENTS (Cont'd)

TABLES

Number	Title	Page
A18	Construction and First Cost - 500-Year	A-26
A19	Average Annual Cost - 500-Year	A-27
A20	Levee Construction Amounts - SPF	A-28
A21	Floodwall Construction Amounts - SPF	A-30
A22	Rt. 441 Bridge Modifications	A-31
A23	Construction and First Cost - SPF	A-32
A24	Average Annual Cost - SPF	A-33

PLATES

Number	Title	Page
A1	Typical Cross Sections	A-34
A2	Typical Cross Sections	A-35
A3	Internal Drainage	A-36

IRONDEQUOIT CREEK WATERSHED, NEW YORK

APPENDIX A
COST ESTIMATES

A1. INTRODUCTION

A1.1 All estimates of costs presented in this appendix are based on March 1981 development and prices. All estimates of average annual costs are based on 50-year project lives and an amortization rate of 7-3/8 percent per annum.

A1.2 All calculated amounts in these estimates, and amounts derived from them, were determined to the nearest $100. Nevertheless, no amount should be considered accurate beyond three significant numbers. Rounding to the nearest $100 was done only to avoid arithmetic discrepancies, and not to reflect accuracy.

A2. COST ESTIMATE

A2.1 General

The estimates for construction, first, and average annual costs as well as the B/C analysis were derived from unit costs developed for this study. Due to the nature of the proposed improvements, it was decided that this was the best method of achieving the desired preliminary costs. In an effort to minimize construction costs, it was decided to make use of the overbank topography in the Panorama Plaza area. Following this philosophy, it was then discovered that there would be a variety of lengths and heights for any particular improvement plan. Therefore, the unit cost tables were established to facilitate computations through interpolation.

A2.2 Unit Costs

After first determining the unit cost (shown in Table A1) for each of the improvement components, a cost was established for a 1-foot thick cross section of this improvement. This known or unit volume cost is then multiplied by the improvement length to obtain its total construction cost. To lower the amount of computations, costs were established for various intervals of improvement heights and a smooth curve, relating costs to heights, was drawn. In this manner, a cost can easily be derived for any improvement height. The derivations are shown in Table A2 for levees and berms, while Table A3 contains floodwall data.

A3. TYPES OF IMPROVEMENT

A3.1 Levees

Costing of the levees was based on a design of 1.0 vertical on 2.5 horizontal side slopes and a 10-foot or 23-foot crown. A freeboard of 3 feet was added to the height of all levees. A profile of a typical section is presented on Plate A1. The formula presented at the bottom of Table A2 along

Table A1 - Unit Costs
(March 1981 Price Levels)

Component	Unit	March 1981 Updated Unit Price
		$
Concrete	Cubic Yard	297.00
Steel (Reinforcing)	Pound	0.60
Sheet Piling	Square Foot	14.15
Excavation (Common)	Cubic Yard	2.40
Compacted Embankment Material Fill	Cubic Yard	6.85
Stripping	Cubic Yard	6.15
Clearing and Grubbing	Acre	3,023.
Topsoil and Seeding	Acre	3,239.
Inspection Trench Excavation	Cubic Yard	2.50
Semi-impervious fill	Cubic Yard	8.15
Backfill (structural)	Cubic Yard	6.85
Excavation (structural)	Cubic Yard	7.75
18-Inch Riprap with 6-Inch Bedding	Square Yard	29.35
Steel Sheet Pile Drop Structure PZ-27	Square Foot	17.30

Table A2 - Levee Unit Costs
Update to March 1981 Price Levels

Height of Levee (feet)	Base Width (feet)	(A) Clear and Grub (Base Width + 10)/43,560 (acre)	(B) Stripping (1.0 ft) (Base Width + 10 ft) (c.y. ÷ 27)	(C) Insp. Trench Excav. $4(h-1) + 2(h-1)^2$ (c.y. ÷ 27)	Semi-Imprv. core inc'l strip. $(h+1)^2 + 5(h+1)$ c.y. ÷ 27	(D) Semi-Imprv. Fill (col. 5+6) (c.y.)	Total Levee inc'l stripping (c.y.)	(E) Compacted Fill (col. 8-6) (c.y.)	(F) Topsoil $2h(2.69) + 20/43,560$ (acre)	Cost/L.F. Rounded (Dollars)
1	15	0.00057	0.93	0.00	0.518	0.518	1.39	0.872	0.00058	20.60
2	20	0.00069	1.11	0.222	0.888	1.111	2.22	1.332	0.00071	31.00
3	25	0.0008	1.30	0.593	1.333	1.926	3.24	1.907	0.00083	44.40
4	30	0.00092	1.48	1.111	1.851	2.962	4.44	2.589	0.00096	60.65
5, 23' Crest	48	0.00133	2.15	1.778	2.444	4.222	8.72	6.276	0.00140	104.50
5	35	0.00103	1.67	1.778	2.444	4.222	5.84	3.396	0.00108	79.95
6, 23' Crest	53	0.00145	2.33	2.59	3.111	5.701	10.77	7.659	0.00152	129.90
6	40	0.00115	1.85	2.59	3.111	5.701	7.40	4.289	0.00120	102.00
7, 23' Crest	58	0.00156	2.52	2.59	3.852	6.442	13.54	9.688	0.00165	151.75
7	45	0.00126	2.04	2.59	3.852	6.442	9.17	5.318	0.00133	117.00
8	50	0.00138	2.22	2.59	4.666	7.256	11.11	6.444	0.00145	133.15
9	55	0.00149	2.41	2.59	5.555	8.145	13.24	7.685	0.00158	153.80
10	60	0.00161	2.59	2.59	6.519	9.109	15.55	9.031	0.00170	169.70
10, 23' Crest	73	0.00191	3.07	2.59	6.519	9.109	20.36	13.845	0.00199	207.90
11	65	0.00172	2.78	2.59	7.555	10.145	18.06	10.505	0.00182	190.10
12	70	0.00184	2.96	2.59	8.666	11.256	20.74	12.074	0.00195	211.75
13	75	0.00195	3.15	2.59	9.852	12.442	23.61	13.758	0.00207	234.95
13, 23' Crest	88	0.00225	3.63	2.59	9.852	12.442	30.35	20.500	0.00236	286.30
14	80	0.00207	3.33	2.59	11.111	13.701	26.66	15.549	0.00220	259.20
15	85	0.00218	3.52	2.59	12.444	15.034	29.91	17.466	0.00232	285.05
16	90	0.00229	3.70	2.59	13.850	16.440	33.33	19.480	0.00244	312.70
17	95	0.00241	3.89	2.59	15.33	17.92	36.95	21.62	0.00256	341.35
18	100	0.00252	4.07	2.59	16.89	19.48	40.74	23.85	0.00268	371.15

Cost/L.F. = 2,800.00 (A) + 5.70 (B) + 2.30 (C) + 7.55 (D) + 6.35 (E) + 3,000.00 (F) + 1.14 (for Drainage Ditch)
3,023.00 + 6.15 + 2.50 + 8.15 + 6.85 + 3,000.00 + 1.23 (for Drainage Ditch)

Table A3 - Floodwall ("I" Wall) Unit Costs (50, 100, 500-Year)

Height (feet)	A (Acre) Clearing and Grubbing width + 20 ft.	B Stripping (1-foot Deep (c.y.) 11'X 1=11 sf/27	C Structural Excavation (c.y.)	D Concrete (c.y.) 1.17(h)/27	E Reinforcing Steel (lbs.) 110#/c.y.	F Topsoil & Seeding (acre)	G Sheet Piling (s.f.)	H Structural Backfill (cy) (B+C)-(0.297)	I Cost/L.F. (Dollars)
3	.00048	0.41	0.52	0.13	14.3	.00048	10.0	0.633	202.60
4	.00048	0.41	0.52	0.17	18.7	.00048	10.0	0.633	217.10
5	.00048	0.41	0.52	0.22	24.2	.00048	10.0	0.633	235.25
6	.00048	0.41	0.52	0.26	28.6	.00048	10.0	0.633	249.75
7	.00048	0.41	0.52	0.30	33.0	.00048	10.0	0.633	264.30
8	.00048	0.41	0.52	0.35	38.5	.00048	10.0	0.633	282.45
9	.00048	0.41	0.52	0.39	42.9	.00048	10.0	0.633	296.95
10	.00048	0.41	0.52	0.43	47.3	.00048	10.0	0.633	311.50
11	.00048	0.41	0.52	0.48	52.8	.00048	10.0	0.633	329.65
12	.00048	0.41	0.52	0.52	57.2	.00048	10.0	0.633	344.15
13	.00048	0.41	0.52	0.56	61.6	.00048	10.0	0.633	358.65
14	.00048	0.41	0.52	0.61	67.1	.00048	10.0	0.633	376.80
15	.00048	0.41	0.52	0.65	71.5	.00048	10.0	0.633	391.35
16	.00048	0.41	0.52	0.69	75.9	.00048	10.0	0.633	405.85

Cost/L.F. = (2,800 + 3,000)A + (5.70)B + (7.20)C + (275.00)D + (0.55)E + (13.10)G + (6.35)H
(3,023 + 3,239)A + (6.15)B + (7.75)C + (297.00)D + (0.60)E + (14.15)G + (6.85)H

Table A3 - Floodwall ("I" Wall) Unit Cost (SPF)

Height (Feet)	A Clearing & Grubbing with +20' (Acre)	B Stripping (1' Deep) (CY) 11'X1 = 11SF/27	C Structural Excavation (CY)	D Concrete (CY) 1.75 (H+3)/27	E Reinforcing Steel (Lbs.) 110#/CY	F Topsoil & Seeding (Acre)	G Sheet Piling (SF)	H Structural Backfill (CY) (B+C)-(0.297)	I Cost /LF Mar 81 Prices
3	.00048	.041	0.52	.39	42.9	.00048	20.0	0.633	436.15
4	.00048	.041	0.52	.45	49.5	.00048	20.0	0.633	457.95
5	.00048	.041	0.52	.52	57.2	.00048	20.0	0.633	483.35
6	.00048	.041	0.52	.58	63.8	.00048	20.0	0.633	505.15
7	.00048	.041	0.52	.65	71.5	.00048	20.0	0.633	530.55
8	.00048	.041	0.52	.71	78.0	.00048	20.0	0.633	552.35
9	.00048	.041	0.52	.78	85.8	.00048	20.0	0.633	577.75
10	.00048	.041	0.52	.84	92.4	.00048	20.0	0.633	599.50
11	.00048	.041	0.52	.91	100.1	.00048	20.0	0.633	624.95
12	.00048	.041	0.52	.97	106.7	.00048	20.0	0.633	646.70
13	.00048	.041	0.52	1.04	114.4	.00048	20.0	0.633	672.10
14	.00048	.041	0.52	1.10	121.1	.00048	20.0	0.633	693.90
15	.00048	.041	0.52	1.17	128.7	.00048	20.0	0.633	719.30
16	.00048	.041	0.52	1.23	135.3	.00048	20.0	0.633	741.10
17	.00048	.041	0.52	1.30	143.0	.00048	20.0	0.633	766.50
18	.00048	.041	0.52	1.36	149.6	.00048	20.0	0.633	788.30
19	.00048	.041	0.52	1.43	157.3	.00048	20.0	0.633	813.70
20	.00048	.041	0.52	1.49	164.0	.00048	20.0	0.666	835.55

Cost/LF = (3,023 + 3,239)A + (6.15)B + (2.75)C + (297.00)D + (0.60)E + (14.15)G + (6.85)H

= (3,023 + 3,239) (.00048) + 6.15 (.041) + 7.75 (.52) + (297)D + (0.60)E + (14.15) (20.0) + (6.85) (.633)

= 294.6 + 297D + .60E

with the values in the table were used to determine the unit cost of each section of levee. The unit costs are used to calculate the total construction costs of the levees along Irondequoit and Allen Creeks as presented in Tables A8, A12, A16, and A21 in this appendix.

A3.2 Floodwalls

A standard "I" wall composed of concrete and reinforced with sheet piling was designed. The steel sheet piling, 10 feet long, will be partially driven into the ground and capped with a reinforced concrete wall. Freeboard of 2 feet was added to the height of all floodwalls. A profile of a typical "I" wall is presented on Plate A2. The formula is presented at the bottom of Table A3 and the values in the table were used to determine the unit cost of each section of the floodwall. The unit costs are used to calculate the total construction costs of the floodwalls along Irondequoit Creek as presented in Tables A9, A13, A17, and A21 in this appendix.

A4. ASSOCIATED COSTS

A4.1 General

In this study, "associated" costs refer to the cost of additional work made necessary by an improvement plan. Since most of the associated costs are repeated among the various improvement alternatives, they are first derived independently and then inserted in the construction cost tabulations of each plan. Further explanations of unit and associated costs appear in the following paragraphs and tables.

A4.2 Interior Drainage

As the result of measures in Alternative B impeding the natural drainage to Irondequoit and Allen Creeks (130 Ac) interior drainage must be considered as part of the plan. As indicated on Plate A3, the study area was divided into four separate drainage areas. For the 50-, 100-, and 500-year levels of protection, the same design was used while the SPF level of protection requires a modification. The aspects of these designs are presented below.

Interior drainage (50; 100, 500-year, and SPF) (130 Ac)

Area 1 - one 27-inch culvert with a flap gate, sluice gate, and 4' x 4' drop inlet.

Area 2 - one 42-inch culvert with a flap gate, sluice gate, and 7' x 7' drop inlet.

Area 3 - one 4' x 5' box culvert with a flapgate, sluice gate, and 8' x 8' drop inlet.

Area 4 - 4' x 6' box culvert with a flapgate, sluice gate, and 15' x 15' drop inlet.

In each area, the culvert pipe and the manhole for the sluice gate will vary in length and height, respectively.

	Design Frequency	Pipe Length	M.H. Height
Area 1	50	74	11.6
	100	74	12.0
	500	74	13.0
	SPF	97	20.9
Area 2	50	51.5	15.3
	100	54	15.8
	500	59	16.8
	SPF	78.5	24.6
Area 3	50	52.5	7.4
	100	56.5	8.2
	500	67.5	10.4
	SPF	103.0	17.5
Area 4	50	103	7.9
	100	103	8.4
	500	103	9.1
	SPF	118	16.4

For Areas 2 and 4, an open ditch along the outside of the levees and floodwalls would be needed to convey the storm runoff to the collection areas. In Area 2, a small culvert would be needed under the Plaza Extension Road. In Area 4, a small culvert would be needed under Old Penfield Road.

A4.3 Land and Property Acquisition

The lands that will be occupied by the levees, floodwalls, erosion protection, and channelization will be permanently used for project purposes, therefore, permanent acquisition will be required. Maintenance easements will be part of the acquisition. No percentage of the land values was taken to reflect the acquisition of easements but rather full value was ascribed to the lands to be acquired.

The amount of land required for the 50-year, 100-year, and 500-year levels of protection for Alternative B will be 22 acres acquired in the study area. The estimate also included acquisition of Harney Printing Company, occupying a parcel on the right bank of Irondequoit Creek with a brick building (approximately 48' x 100') and an asphalt driveway and parking lot, and a 16' x 52' and 18' x 20' bunk houses in Camp Haccamo. The Harney

Printing Company will be eligible for relocation assistance under PL 91-646. The total cost estimate is as follows:

Industrial Land, 14 Acres	=	$ 700,000
Relocation Expenses	=	10,000
Commercial Land, 6 Acres	=	600,000
Residential Land, 2 Acres	=	10,000
Three Buildings	=	179,760
Cost of Acquisition	=	45,000
		$1,544,760

The amount of land required for the SPF level of protection for Alternative B will increase by 7.4 acres. Eight buildings will be acquired in the study area, a print shop and seven bunk houses in Camp Haccamo. The total cost estimate of real estate for the SPF design is as follows:

Additional 7.4 Acres of Commercial Land	=	$ 740,000
Five Additional Buildings	=	91,850
Previous Land and Buildings Estimate	=	1,499,760
Cost of Acquisition	=	45,000
		$2,376,610

All real estate estimates were prepared by the Realty Specialist stationed at the District Office. The estimates were coordinated with the Real Estate Office at the Division Office.

A4.4 New Pavement

Due to space limitation the levee, in Alternative B, will be constructed along the alignment of the private road to the Genesee Conservation League. The private road will be reconstructed along the 23-foot crest with two lanes and ramped down to existing pavement at either end. Also a portion of the road for the Brookhill Apartments would be relocated near Old Penfield Road. A cost breakdown is presented in Table A4 of the total new pavement quantities at all levels of protection.

A4.5 Utilities

The alignment of the proposed levees and proposed channelization, in Alternative B, would require the moving of 19 transmission poles. As proposed the levees are set back from the creek behind Panorama Plaza to create a flood plain. The sanitary sewer manholes in this area would have to be raised or floodproofed to prevent floodwater infiltration. In several other reaches the levee covers the alignment of the Monroe County Pure Water's interceptor. In these areas the sanitary manholes would be raised for maintenance access. The Monroe County Pure Water's chemical feed building located behind Panorama Plaza would be floodproofed. Since the building is all brick construction with no windows, the minimal cost would be covered in the contingencies.

Table A4 - New Pavement

Item	Quantity	Unit	Unit Cost	Cost
			$	$
1. Prepare and Roll Sub Base	4,000	s.y.	1.25	5,000
2. 4-inch Sub Base Course	4,000	s.y.	1.45	5,800
3. 4-inch Bituminous Base Course	4,000	s.y.	6.20	24,800
4. 2.5-inch Wearing Course	4,000	s.y.	3.95	15,800
Sub Total				51,400

Table A5 - Utility Relocation

Item	Quantity	Unit Cost	Cost
50, 100, and 500 Year		$	$
Transmission Poles	19	1,780	33,820
Feet of Raised Sanitary Sewer	41	60	2,460
Manholes			
Total			36,280
		approximately	36,300
SFS			
Transmission Poles	34	1,780	60,520
Feet of Raised Sanitary Sewer	50	60	3,000
Manholes			
Total			63,520
		approximately	63,500

A4.6 Channels and Erosion Protection

Irondequoit Creek and Allen Creek are subject to severe bank erosion due to the soil conditions and high flood velocities, as described in the Geotechnical Appendix. Riprap would be placed at several locations along Irondequoit Creek where erosion prevention would be critical. To place the 18-inch riprap with 6-inch bedding material, a portion of the channel would be excavated as indicated on Plate A1. A cost breakdown of channel and riprap costs are presented in Table A6.

A portion of Allen Creek would be realigned, as indicated on Plate A3, to improve the hydraulic flow characteristics. Also a three-foot drop structure is proposed for construction in Allen Creek. A cost breakdown of the required channelization, riprap placement, and drop structure construction costs are detailed on Table A7.

A4.7 Flood Warning System

A flood warning system is proposed to provide ample time for people to evacuate the Panorama Plaza area, though due to the hydrologic characteristics, insufficient time would be allowed to install floodproofing

measures. Precipitation and stream gages would be located upstream on Irondequoit Creek and Allen Creek. An alarm would sound at a local police station. An annual non-Federal maintenance cost ($1,000) is included for the telephone lines and gage maintenance.

A5. MAINTENANCE

The maintenance costs for the various levels of protection for Alternative B are presented as both Federal and non-Federal responsibiities. The Federal maintenance cost is a flat cost of $10,200/year, of which $300/year is for a Federal inspection of the project improvements and $9,900/year is for operation of the existing gages on Irondequoit Creek and Allen Creek. The non-Federal maintenance cost is estimated to be $\pm$ 1.5 percent of the first cost. The non-Federal maintenance cost includes debris removal, bank repair, erosion protection repair, floodwall repair, drop structure repair, maintenance of pump station, maintenance of vegetative planting, and maintenance of the flood warning system.

A6. SUMMARY

Alternative B was costed for the 50-, 100-, 500-year and SPF levels of protection. A summary of these construction and first costs, and average annual costs for each level of protection were grouped together to clarify the sequence for deriving the cost estimates. Engineering and Design, Supervision and Inspection, and overhead costs were calculated for the Federal construction costs. Contingencies were added to both the Federal and non-Federal construction costs.

The period of construction should be less than 2 years, therefore, no interest during construction was added to the first costs. Annual costs were based on an interest and amortization rate of 7-3/8 percent over a 50-year project life.

Table A6 - Channels and Riprap Costs
Update to March 1981 Price Levels
Irondequoit Creek

Item	Quantity	Unit	Unit Cost	Amount
			$	$
50-year Level of Protection				
Clearing & Grubbing	1.0	Ac	3,023.00	3,023
Excavation	3,200	cy	2.40	7,680
18-inch Riprap with				
6-inch Bedding	4,400	sy	29.35	129,140
Subtotal				139,843
100-year Level of Protection				
Clearing & Grubbing	1.0	Ac	3,023.00	3,023
Excavation	3,200	cy	2.40	7,680
18-inch Riprap with				
6-inch Bedding	4,500	sy	29.35	132,075
Subtotal				142,778
500-year Level of Protection				
Clearing & Grubbing	1.0	Ac	3,023.00	3,023
Excavation	3,200	cy	2.40	7,680
18-inch Riprap with				
6-inch Bedding	4,700	sy	29.35	137,945
Subtotal				148,648
SPF Level of Protection				
Clearing & Grubbing	4.0	Ac	3,023.00	12,092
Excavation	13,800	cy	2.40	33,120
18-inch Riprap with				
6-inch Bedding	38,000	sy	29.35	1,115,300
Subtotal				1,160,512

Table A7 - Channels and Riprap Costs
Allen Creek

Item	Quantity	Unit	Unit Cost	Amount
			$	$
50-year Level of Protection				
Clearing & Grubbing	1.3	Ac	3,023.00	3,930
Excavation	15,200	cy	2.40	36,480
Compacted Fill	2,000	cy	6.85	13,700
18-inch Riprap with 6-inch Bedding	8,100	sy	29.33	237,735
Steel Sheet Pile Drop Structure PZ-27	1,136	sf	17.30	19,653
Subtotal				311,498
100-year Level of Protection				
Clearing & Grubbing	1.3	Ac	3,023.00	3,930
Excavation	15,200	cy	2.40	36,480
Compacted Fill	2,000	cy	6.85	13,700
18-inch Riprap with 6-inch Bedding	8,200	sy	29.35	240,670
Steel Sheet Pile Drop Structure PZ-27	1,136	sf	17.30	19,653
Subtotal				314,433
500-year Level of Protection				
Clearing & Grubbing	1.3	Ac	3,023.00	3,930
Excavation	15,200	cy	2.40	36,480
Compacted Fill	2,000	cy	6.85	13,700
18-inch Riprap with 6-inch Bedding	8,400	sy	29.35	246,540
Steel Sheet Pile Drop Structure PZ-27	1,136	sf	17.30	19,653
Subtotal				320,303
SPF Level of Protection				
Clearing & Grubbing	2.4	Ac	3,023.00	7,255
Excavation	21,000	cy	2.40	50,400
Compacted Fill	2,800	cy	6.85	19,180
18-inch Riprap with 6-inch Bedding	11,400	sy	29.35	334,590
Steel Sheet Pile Drop Structure PZ-27	1,136	sf	17.30	19,653
Subtotal				431,078

Table A8 - Levee Construction Amounts - 50-Year
Irondequoit Creek

Item	Description	Quantity Measured Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 51+65 to 52+00 1.5 ft. high	40	LF	31.00	1,240
2	Sta. 52+00 to 53+00 3.5 ft. high	300	LF	60.65	18,195
3	Sta. 53+00 to 55+40 5.0 ft. high 23 ft. crest	200	LF	104.50	20,900
4	Sta. 55+40 to 59+50 5.3 ft. high 23 ft. crest	470	LF	104.50	49,115
5	Sta. 59+50 to 61+80 4.5 ft. high	200	LF	79.95	15,990
6	Sta. 61+80 to 61.90 2.0 ft. high	10	LF	31.00	310
7	Sta. 62+30 to 62.75 2.7 ft. high	60	LF	44.40	2,664
8	Sta. 62+75 to 63+00 8.8 ft. high	20	LF	150.80	3,016
9	Sta. 63+00 to 6_+30 9.8 ft. high	25	LF	169.70	4,242
10	Sta. 63+30 to 64+00 6.8 ft. high	80	LF	117.00	9,360
11	Sta. 64+00 to 69+60 6.4 ft. high	580	LF	102.00	59,160
12	Sta. 69+60 to 75+40 7.0 ft. high	230	LF	117.00	26,910
13	Sta. 75+40 to 77+15 7.1 ft. high	290	LF	117.00	33,930
14	Sta. 77+15 to 80+70 6.6 ft. high	170	LF	117.00	19,890
15	Sta. 80+70 to 86+42 9.7 ft. high	710	LF	169.70	120,487
16	Sta. 86+42 to 86+58 1.4 ft. high	25	LF	20.60	515
17	Sta. 87+48 to 87+65 2.5 ft. high	17	LF	44.40	755
18	Sta. 87+65 to 89+80 5.5 ft. high	330	LF	102.00	33,660
19	Sta. 89+80 to 90+00 5.5 ft. high Sta. 90+00 offsets	60	LF	102.00	6,120
20	190 ft. to 390 ft. 5.5 ft. high	200	LF	102.00	20,400
21	390 ft. to 420 ft. 4.5 ft. high	20	LF	79.95	1,599
22	410 ft. to 470 ft. 1.5 ft. high	60	LF	31.00	1,860
23	470 ft. to 510 ft. 0.5 ft. high	40	LF	20.60	824
24	750 ft. to 790 ft. 0.5 ft. high	40	LF	20.60	824
25	790 ft. to 840 ft. 1.0 ft. high	50	LF	20.60	1,030
26	840 ft. to 905 ft. 0.3 ft. high	65	LF	6.20	403
	Levee Subtotal				453,399

Table A8 - Levee Construction Amounts - 50-Year (Cont'd)
Allen Creek

Item	Description	Quantity Measured: Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 2+00 to 3+00 8.8 ft. high:	100	LF	150.80	15,080
2	Sta. 3+00 to 4+20 7.8 ft. high:	120	LF	133.15	15,978
3	Sta. 4+20 to 5+20 7.3 ft. high:	100	LF	117.00	11,700
4	Sta. 5+20 to 6+20 7.8 ft. high:	100	LF	129.00	12,900
5	Sta. 6+20 to 7+20 6.4 ft. high:	100	LF	102.00	10,200
6	Sta. 7+20 to 8+40 4.9 ft. high:	120	LF	79.95	9,594
7	Sta. 8+40 to 10+00 8.7 ft. high:	160	LF	150.80	24,128
8	Sta. 10+00 to 11+60 8.7 ft. high:	160	LF	150.80	24,128
9	Sta. 11+60 to 12+00 7.7 ft. high:	40	LF	133.15	5,326
10	Sta. 12+00 to 13+00 5.7 ft. high:	100	LF	102.00	10,200
11	Sta. 13+C0 to 13+90 2.7 ft. high:	90	LF	44.40	3,996
12	Sta. 13+90 to 14+00 0.1 ft. high:	10	LF	2.06	21
	Levee Subtotal				143,251

Table A9 - Floodwall ("I" Wall) Construction Amounts - 50-Year

Item	Description	Quantity Measured Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 71+50 - 71+60 13.8 ft. high:	10	LF	373.15	3,732
2	Sta. 71+60 - 72+00 11.8 ft. high:	60	LF	341.25	20,475
3	Sta. 72+00 - 72+50 9.8 ft. high:	50	LF	308.60	15,430
4	Sta. 72+50 - 73+40 8.8 ft. high:	90	LF	294.05	26,464
5	Sta. 73+40 - 74+30 9.3 ft. high:	90	LF	301.30	27,117
6	Sta. 79+30 - 74+50 9.8 ft. high:	20	LF	308.65	6,173
7	Sta. 74+70 - 74+90 9.6 ft. high:	20	LF	305.70	6,114
8	Sta. 74+90 - 75+40 10.1 ft. high:	55	LF	313.20	17,226
9	Sta. 75+40 - 77+40 10.6 ft. high:	190	LF	321.60	61,104
10	Sta. 77+40 - 80+00 9.7 ft. high:	270	LF	307.15	82,931
11	Sta. 80+00 - 84+00 8.2 ft. high:	385	LF	285.35	109,860
12	Sta. 84+00 - 85+60 6.3 ft. high:	100	LF	254.10	25,410
13	Sta. 85+60 - 86+50 4.3 ft. high:	80	LF	222.55	17,804
14	Sta. 86+50 - 86+70 3.0 ft. high:	40	LF	202.60	8,104
15	Flood Gates		LS		10,800
	I-Wall Subtotal				438,744

A10 - Construction and First Cost - Alternative B - 50-Year

Item	Amount
	$
Federal Costs	
Flood Warning System	25,000
Levees and Floodwalls (Table A8 & A9)	1,035,394
New Pavement (Table A4)	51,400
Channels (Table A6 & A7)	451,341
Interior Drainage	263,200
Subtotal	1,826,335
Contingencies @ 20 percent ±	365,665
Subtotal	2,192,000
Engineering and Design 20 percent ±	438,000
Supervision and Inspection (0.095)	208,000
Overhead	150,000
E & D (0.1900) = $83,000	
S & I (0.3200) = $67,000	
Total Federal Cost	2,988,000
Non-Federal Costs	
Lands and Damages (including contingencies)	1,544,760
Utility Relocations (Table A5)	36,300
Contingencies @ 20 percent ±	6,940
Total Non-Federal Cost	1,588,000
Total First Cost	4,576,000

Total Contractor's Earnings Plus Contingencies 2,192,000

Engineering and Design
$2,192,000 (0.20) 438,000

Supervision and Administration
Supervision and Inspection
$2,192,000 (0.095) = $208,000

Overhead
E & D $438,000 (0.19) = $83,000
S & I $208,000 (0.32) = $67,000 150,000

358,000

Table A11 - Average Annual Cost - 50-Year

Item	Amount
	$
Federal	
First Cost	2,988,000
Interest During Construction	0
	2,988,000
Annual Charges	
Interest (7-3/8 percent)	220,400
Amortization	6,500
Maintenance 1/	10,200
Subtotal	237,100
Non-Federal	
First Cost	1,588,000
Interest During Construction	0
	1,588,000
Annual Charges	
Interest (7-3/8 percent)	117,100
Amortization	3,400
Maintenance 2/	69,600
Subtotal	190,100
Total Annual Cost	427,200

1/ $300 inspection, $9,900 gage operation.
2/ Includes $1,000 for the flood warning system maintenance.

Table A12 - Levee Construction Amounts - 100-Year
Irondequoit Creek

Item	Description	Quantity Measured: Dist.	Unit	Unit Price $	Amount $
1	Sta. 51+65 to 52+00 2.0 ft. high	40	LF	31.00	1,240
2	Sta. 52+00 to 53+00 4.0 ft. high 23 ft. crest	300	LF	60.65	18,195
3	Sta. 53+00 to 55+40 5.5 ft. high 23 ft. crest	200	LF	129.90	25,980
4	Sta. 55+40 to 59+50 5.8 ft. high	470	LF	129.90	61,053
5	Sta. 59+50 to 61+80 5.0 ft. high	200	LF	79.95	15,990
6	Sta. 61+80 to 61+90 2.5 ft. high	10	LF	44.40	444
7	Sta. 62+30 to 62+75 3.2 ft. high	60	LF	44.40	2,664
8	Sta. 62+75 to 63+00 9.3 ft. high	20	LF	150.80	3,016
9	Sta. 63+00 to 63+30 10.3 ft. high	25	LF	169.70	4,242
10	Sta. 63+30 to 64+00 7.3 ft. high	80	LF	117.00	9,360
11	Sta. 64+00 to 69+60 6.9 ft. high	580	LF	117.00	67,860
12	Sta. 69+60 to 75+40 7.5 ft. high	230	LF	133.15	30,624
13	Sta. 75+40 to 77+15 7.6 ft. high	290	LF	133.15	38,614
14	Sta. 77+15 to 80+70 7.1 ft. high	170	LF	117.00	19,890
15	Sta. 80+70 to 86+42 10.2 ft. high	710	LF	169.70	120,487
16	Sta. 86+42 to 86+58 1.9 ft. high	25	LF	31.00	775
17	Sta. 87+48 to 87+65 3.0 ft. high	17	LF	44.40	755
18	Sta. 87+65 to 89+80 6.0 ft. high	330	LF	102.00	33,660
19	Sta. 89+80 to 90+00 6.0 ft. high Sta. 90+00 Offsets	60	LF	102.00	6,120
20	190 ft. to 390 ft. 6.0 ft. high	200	LF	102.00	20,400
21	390 ft. to 410 ft. 5.0 ft. high	20	LF	79.95	1,599
22	410 ft. to 470 ft. 2.0 ft. high	60	LF	31.00	1,860
23	470 ft. to 510 ft. 1.0 ft. high	40	LF	20.60	824
24	750 ft. to 790 ft. 1.0 ft. high	40	LF	20.60	824
25	790 ft. to 840 ft. 1.5 ft. high	50	LF	31.00	1,550
26	840 ft. to 905 ft. 0.8 ft. high	65	LF	20.60	1,339
	Levee Subtotal				489,365

Table A12 - Levee Construction Amounts - 100-Year (Cont'd)
Allen Creek

Item	Description	Quantity Measured Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 2+00 to 3+00 9.3 ft. high	100	LF	150.80	15,080
2	Sta. 3+00 to 4+20 8.3 ft. high	120	LF	133.15	15,978
3	Sta. 4+20 to 5+20 7.8 ft. high	100	LF	133.15	13,315
4	Sta. 5+20 to 6+20 8.3 ft. high	100	LF	133.15	13,315
5	Sta. 6+20 to 7+20 6.9 ft. high	100	LF	117.00	11,700
6	Sta. 7+20 to 8+40 5.4 ft. high	120	LF	79.95	9,594
7	Sta. 8+40 to 10+00 9.2 ft. high	160	LF	150.80	24,128
8	Sta. 10+00 to 11+60 9.2 ft. high	160	LF	150.80	24,128
9	Sta. 11+60 to 12+00 8.2 ft. high	40	LF	133.15	5,326
10	Sta. 12+00 to 13+00 6.2 ft. high	100	LF	102.00	10,200
11	Sta. 13+00 to 13+90 3.2 ft. high	90	LF	44.40	3,996
12	Sta. 13+90 to 14+00 0.6 ft. high	10	LF	20.60	206
	Levee Subtotal				146,966

Table A13 - Floodwall (I-Wall) Construction Amounts - 100-Year

Item	Description	Quantity Measured Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 71+50 - 71+60 14.3 ft. high	10	LF	381.15	3,812
2	Sta. 71+60 - 72+00 12.3 ft. high	60	LF	348.50	20,910
3	Sta. 72+00 - 72+50 10.3 ft. high	50	LF	316.55	15,828
4	Sta. 72+50 - 73+40 9.3 ft. high	90	LF	301.35	27,122
5	Sta. 73+40 - 74+30 9.8 ft. high	90	LF	308.65	27,778
6	Sta. 74+30 - 74+50 10.3 ft. high	20	LF	316.55	6,331
7	Sta. 74+70 - 74+90 10.1 ft. high	20	LF	313.20	6,264
8	Sta. 74+90 - 75+40 10.6 ft. high	55	LF	321.60	17,688
9	Sta. 75+40 - 77+40 11.1 ft. high	190	LF	331.10	62,909
10	Sta. 77+40 - 80+00 10.2 ft. high	270	LF	314.85	85,010
11	Sta. 80+00 - 84+00 8.7 ft. high	385	LF	292.60	112,651
12	Sta. 84+00 - 85+60 6.8 ft. high	100	LF	261.45	26,145
13	Sta. 85+60 - 86+50 4.8 ft. high	80	LF	231.65	18,532
14	Sta. 86+50 - 86+70 3.4 ft. high	40	LF	208.40	8,336
15	Flood Gates		LS		10,800
	I-Wall Subtotal				450,116

A14 - Construction and First Cost - Alternative B - 100-Year

Item	Amount
	$
Federal Costs	
Flood Warning System	25,000
Levees and Floodwalls (Table A12 & A13)	1,086,447
New Pavement (Table A4)	51,400
Channels (Table A6 & A7)	457,211
Interior Drainage	267,300
Subtotal	1,887,358
Contingencies @ 20 percent ±	377,642
Subtotal	2,265,000
Engineering and Design 20 percent ±	453,000
Supervision and Inspection (0.095)	213,000
Overhead	154,000
E & D (0.1900) = $86,000	
S & I (0.3200) = $68,000	
Total Federal Cost	3,085,000
Non-Federal Costs	
Lands and Damages (including contingencies)	1,544,760
Utility Relocations (Table A5)	36,300
Contingencies @ 20 percent ±	6,940
Total Non-Federal Cost	1,588,000
Total First Cost	4,673,000

Total Contractor's Earnings Plus Contingencies			2,265,000
Engineering and Design			
$2,265,000 (0.20)			453,000
Supervision and Administration			
Supervision and Inspection			
$2,265,000 (0.094)	=	$213,000	
Overhead			
E & D $453,000 (0.19) =	$86,000		
S & I $213,000 (0.32) =	68,000		
		$154,000	
			367,000

Table A15 - Average Annual Cost - 100-Year

Item	Amount
	$
Federal	
First Cost	3,085,000
Interest During Construction	0
	3,085,000
Annual Charges	
Interest (7-3/8 percent)	227,500
Amortization	6,700
Maintenance 1/	10,200
Subtotal	244,400
Non-Federal	
First Cost	1,588,000
Interest During Construction	0
	1,588,000
Annual Charges	
Interest (7-3/8 percent)	117,100
Amortization	3,400
Maintenance 2/	71,100
Subtotal	191,600
Total Annual Cost	436,000

1/ $300 inspection, $9,900 gage operation.
2/ Includes $1,000 for the flood warning system maintenance.

Table A16 - Levee Construction Amounts - 500-Year
Irondequoit Creek

Item	Description	Quantity Measured Dist.	Unit	Unit Price $	Amount $
1	Sta. 51+65 to 52+00 3.0 ft. high:	40	LF	44.40	1,776
2	Sta. 52+00 to 53+00 5.0 ft. high:	300	LF	79.95	23,985
3	Sta. 53+00 to 55+40 6.5 ft. high: 23 ft. crest	200	LF	151.75	30,350
4	Sta. 55+40 to 59+50 6.8 ft. high: 23 ft. crest	470	LF	151.75	71,322
5	Sta. 59+50 to 61+80 6.0 ft. high:	200	LF	102.00	20,400
6	Sta. 61+80 to 61+90 3.5 ft. high:	10	LF	60.65	606
7	Sta. 62+30 to 62+75 4.2 ft. high:	60	LF	60.65	3,639
8	Sta. 62+75 to 63+00 10.3 ft. high:	20	LF	169.70	3,394
9	Sta. 63+00 to 63+30 11.3 ft. high:	25	LF	190.10	4,752
10	Sta. 63+30 to 64+00 8.3 ft. high:	80	LF	133.15	10,652
11	Sta. 64+00 to 69+60 7.9 ft. high:	580	LF	133.15	77,227
12	Sta. 69+60 to 75+40 8.5 ft. high:	230	LF	150.80	34,684
13	Sta. 75+40 to 77+15 8.6 ft. high:	290	LF	133.15	38,614
14	Sta. 77+15 to 80+70 8.1 ft. high:	170	LF	133.15	22,636
15	Sta. 80+70 to 86+42 11.2 ft. high:	710	LF	190.10	134,971
16	Sta. 86+42 to 86+58 2.9 ft. high:	25	LF	44.40	1,110
17	Sta. 87+48 to 87+65 4.0 ft. high:	17	LF	60.65	1,031
18	Sta. 87+65 to 89+80 7.0 ft. high:	330	LF	117.00	38,610
19	Sta. 89+80 to 90+00 7.0 ft. high: Sta. 90+00 Offsets	60	LF	117.00	7,020
20	190 ft. to 390 ft. 7.0 ft. high:	200	LF	117.00	23,400
21	390 ft. to 410 ft. 6.0 ft. high:	20	LF	102.00	2,040
22	410 ft. to 470 ft. 3.0 ft. high:	60	LF	44.40	2,664
23	470 ft. to 510 ft. 2.0 ft. high:	40	LF	31.00	1,240
24	750 ft. to 790 ft. 2.0 ft. high:	40	LF	31.00	1,240
25	790 ft. to 840 ft. 2.5 ft. high:	50	LF	44.40	2,220
26	840 ft. to 905 ft. 1.8 ft. high:	65	LF	31.00	2,015
	Levee Subtotal				561,598

Table A16 - Levee Construction Amounts - 500-Year (Cont'd)
Allen Creek

Item	Description	Quantity Measured Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 2+00 to 3+00 10.3 ft. high	100	LF	169.70	16,970
2	Sta. 3+00 to 4+20 9.3 ft. high	120	LF	150.80	18,096
3	Sta. 4+20 to 5+20 8.8 ft. high	100	LF	150.80	15,080
4	Sta. 5+20 to 6+20 9.3 ft. high	100	LF	150.80	15,080
5	Sta. 6+20 to 7+20 7.9 ft. high	100	LF	133.15	13,315
6	Sta. 7+20 to 8+40 6.4 ft. high	120	LF	102.00	12,240
7	Sta. 8+40 to 10+00 10.2 ft. high	160	LF	169.70	27,152
8	Sta. 10+00 to 11+60 10.2 ft. high	160	LF	169.70	27,152
9	Sta. 11+60 to 12+00 9.2 ft. high	40	LF	150.80	6,032
10	Sta. 12+00 to 13+00 7.2 ft. high	100	LF	117.00	11,700
11	Sta. 13+00 to 13+90 4.2 ft. high	90	LF	60.65	5,458
12	Sta. 13+90 to 14+00 1.6 ft. high	10	LF	31.00	310
	Levee Subtotal				168,585

Table A17 - Floodwall (I-Wall) Construction Amounts - 500-Year

Item	Description	Quantity Measured Dist.	Unit	Unit Price	Amount
				$	$
1	Sta. 71+50 - 71+60 15.3 ft. high	10	LF	395.70	3,957
2	Sta. 71+60 - 72+00 13.3 ft. high	60	LF	364.10	21,846
3	Sta. 72+00 - 72+50 11.3 ft. high	50	LF	334.00	16,700
4	Sta. 72+50 - 73+40 10.3 ft. high	90	LF	316.55	28,490
5	Sta. 73+40 - 74+30 10.8 ft. high	90	LF	324.95	29,246
6	Sta. 74+30 - 74+50 11.3 ft. high	20	LF	334.00	6,680
7	Sta. 74+70 - 74+90 11.1 ft. high	20	LF	331.10	6,622
8	Sta. 74+90 - 75+40 11.6 ft. high	55	LF	352.85	19,407
9	Sta. 75+40 - 77+40 12.1 ft. high	190	LF	345.60	65,664
10	Sta. 77+40 - 80+00 11.2 ft. high	270	LF	332.55	89,788
11	Sta. 80+00 - 84+00 9.7 ft. high	385	LF	307.15	118,253
12	Sta. 84+00 - 85+60 7.8 ft. high	100	LF	278.80	27,880
13	Sta. 85+60 - 86+50 5.8 ft. high	80	LF	246.85	19,748
14	Sta. 86+50 - 86+70 4.4 ft. high	40	LF	224.40	8,976
15	Flood Gates		LS		10,800
	I-Wall Subtotal				474,056

A18 - Construction and First Cost - Alternative B - 500-Year

Item	Amount
	$
Federal Costs	
Floodwarning System	25,000
Levees and Floodwalls (Table A16 & A17)	1,204,240
New Pavement (Table A4)	51,400
Channels (Table A6 & A7)	468,951
Interior Drainage	283,200
Subtotal	2,032,791
Contingencies @ 20 percent ±	402,209
Subtotal	2,435,000
Engineering and Design 20 percent ±	485,000
Supervision and Inspection (0.093)	227,000
Overhead	161,000
E & D (0.1900) = $91,000	
S & I (0.3200) = $69,000	
Total Federal Cost	3,312,000
Non-Federal Costs	
Lands and Damages (including contingencies)	1,544,760
Utility Relocations (Table A5)	36,300
Contingencies @ 20 percent ±	6,940
Total Non-Federal Cost	1,588,000
Total First Cost	4,900,000

Total Contractor's Earnings Plus Contingencies 2,435,000

Engineering and Design
$2,435,000 (0.199) = 485,000

Supervision and Administration
Supervision and Inspection
$2,439,000 (0.093) = $227,000
Overhead
E & D $485,000 (0.19) = $92,000
S & I $227,000 (0.32) = $73,000
165,000
392,000

Table A19 - Average Annual Cost - 500-Year

Item	Amount
	$
Federal	
First Cost	3,312,000
Interest During Construction	0
	3,312,000
Annual Charges	
Interest (7-3/8 percent)	244,300
Amortization	7,200
Maintenance 1/	10,200
Subtotal	261,700
Non-Federal	
First Cost	1,588,000
Interest During Construction	0
	1,588,000
Annual Charges	
Interest (7-3/8 percent)	117,100
Amortization	3,400
Maintenance 2/	74,500
Subtotal	195,000
Total Annual Cost	456,700

1/ $300 inspection, $9,900 gage operation.
2/ Includes $1,000 for the flood warning system maintenance.

Table A20 - Levee Construction Amounts - SPF - Irondequoit Creek

Unit	Description	Quantity	Unit	Unit Price	Amount
	Levees	Meas. Dist.		$	$
1	Sta. 49+90 to 50+10 3.5 ft. high	25	LF	60.65	1,516
2	Sta. 50+10 to 53+58 10 ft. high	415	LF	169.70	70,426
3	Sta. 53+58 to 54+50 10 ft. high 23 ft. crest	210	LF	207.90	43,659
4	Sta. 54+70 to 56+20 13 ft. high 23 ft. crest	235	LF	286.30	67,280
5	Sta. 56+20 to 58+30 13 ft. high 23 ft. crest	340	LF	286.30	97,342
6	Sta. 58+30 to 60+95 15 ft. high 10 ft. crest	190	LF	285.05	54,160
7	Sta. 60+95 to 61+80 16 ft. high	85	LF	312.70	26,580
8	Sta. 62+35 to 71+65 15 ft. high	720	LF	285.05	205,236
9	Sta. 71+65 to 77+15 15 ft. high	540	LF	285.05	153,927
10	Sta. 79+30 to 86+80 16 ft. high	880	LF	312.70	275,176
11	Sta. 87+00 to 90+45 15 ft. high	345	LF	285.05	98,342
12	Sta. 90+45 to 91+40 16 ft. high	90	LF	312.70	28,143
13	Sta. 91+40 to 92+00 15 ft. high	70	LF	285.05	19,954
14	Sta. 92+00 to 92+20 17 ft. high	20	LF	341.35	6,827
15	Sta. 92+20 to 95+35 17 ft. high	305	LF	341.35	104,112
16	Sta. 95+35 to 100+50 15ft. high	510	LF	285.05	88,366
17	Sta. 100+50 to 100+70 11 ft. high	20	LF	190.10	3,802
18	Sta. 100+70 to 100+90 9 ft. high	20	LF	150.80	3,016
19	Sta. 100+90 to 101+006 6 ft. high	10	LF	102.00	1,020
20	Sta. 87+00 to 87+25 10 ft. high	25	LF	169.70	4,242
21	Sta. 87+25 to 90+70 15 ft. high	340	LF	285.05	96,917
					1,450,043

Table A20 - Levee Construction Amounts - SPF - Irondequoit Creek (Con'd)

Unit	Description	Quantity	Unit	Unit Price	Amount
	Levees	Meas. Dist.		$	$
22	Sta. 90+70 to 91+35 13 ft. high	70	LF	234.85	16,440
23	Sta. 91+35 to 95+75 8 ft. high	450	LF	133.15	59,918
24	Sta. 95+75 to 97+75 6 ft. high	200	LF	102.00	20,400
25	Sta. 97+75 to 98+20 11 ft. high	50	LF	190.10	9,505
26	Sta. 98+20 to 98+70 15 ft. high	40	LF	285.05	11,402
27	Sta. 98+70 to 100+00 11 ft. high	40	LF	190.10	7,604
28	Sta. 100+00 to 100+30 2 ft. high	30	LF	31.00	930
	Levees Subtotal				1,576,242

Levee Construction Amounts - SPF - Allen Creek

		Meas. Dist.		$	$
1	Sta. 1+50 to 2+95 18 ft. high	140	LF	371.15	51,961
2	Sta. 2+95 to 3+85 16 ft. high	100	LF	312.70	31,270
3	Sta. 3+85 to 6+85 18 ft. high	305	LF	371.15	113,201
4	Sta. 6+85 to 9+25 17 ft. high	315	LF	341.35	107,525
5	Sta. 9+25 to 10+20 12 ft. high	100	LF	211.75	21,175
6	Sta. 10+20 to 11+20 10 ft. high	100	LF	169.70	16,970
7	Sta. 11+20 to 12+10 8 ft. high	100	LF	133.15	13,315
8	Sta. 12+10 to 12+75 6 ft. high	60	LF	102.00	6,120
9	Sta. 12+25 to 13+25 4 ft. high	60	LF	60.65	3,639
10	Sta. 13+25 to 13+65 2 ft. high	40	LF	31.00	1,240
11	Sta. 13+65 to 13+75 5 ft. high	10	LF	20.60	206
	Levee Subtotal				366,622

Table A21 - Floodwall (I Wall) Construction Amounts - SPF

Unit	Description	Quantity Meas. Dist.	Unit	Unit Price $	Amount $
1	Sta. 70+65 to 71+40 11 ft. high	80	LF	624.95	49,996
2	Sta. 71+40 to 72+00 20 ft. high	70	LF	835.55	58,488
3	Sta. 72+00 to 73+00 17 ft. high	110	LF	766.50	84,315
4	Sta. 73+00 to 74+50 16 ft. high	150	LF	741.10	111,165
5	Sta. 74+70 to 74+90 15 ft. high	20	LF	719.30	14,386
6	Sta. 74+90 to 77+40 16 ft. high	240	LF	741.10	177,864
7	Sta. 77+40 to 81+15 16 ft. high	405	LF	741.10	300,146
8	Sta. 81+15 to 82+55 13 ft. high	300	LF	672.10	201,630
9	Sta. 82+55 to 83+75 11 ft. high	295	LF	624.95	184,360
10	Sta. 90+30 to 91+35 9 ft. high	100	LF	577.75	57,775
11	Sta. 91+35 to 94+30 8 ft. high	295	LF	552.35	162,943
	I Wall Subtotal				1,403,068

Table A22 - Route 441 Bridge Modifications - SPF Only -
Irondequoit Creek

Unit	Description	Quantity	Unit	Unit Price	Amount
	Retaining Walls			$	$
1	Excavation	240	CY	7.75	1,860
2	Backfill	80	CY	6.85	548
3	Re-Steel	57,500	LBS	0.60	34,500
4	Concrete	380	CY	297.00	112,860
	Retaining Walls Subtotal				149,768
	Curbing				
1	Over Bridge				
	a. Concrete	13	CY	297.00	3,861
	b. Reinforcement	1,430	LBS	0.60	858
	Subtotal				4,719
2	Off Bridge				
	a. Concrete	14	CY	297.00	4,158
	b. Reinforcement	1,540	LBS	0.60	924
	c. Excavation	65	CY	7.75	504
	d. Backfill	50	CY	6.85	342
	Subtotal				5,928
	Curbing Subtotal				10,647
	Total (Retaining Walls and Curbs)				160,415

Table A23 - Construction and First Cost - Alternate B - SPF

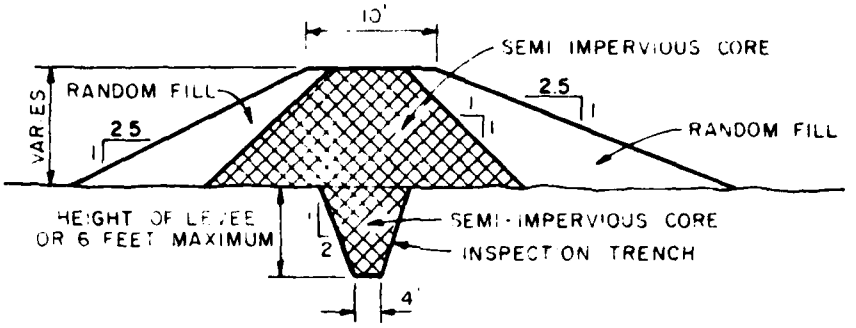
Item	Amount
Federal Costs	$
Flood Warning System	25,000
Demolition of Structures	18,800
Levees & Floodwalls (Table A20 and A21)	3,345,932
New Pavement Table A4)	51,400
Channel (Table A6 and A7)	1,591,590
Retaining Walls & Curbs Table A22)	160,415
Interior Drainage	364,400
Subtotal	5,557,537
Contingencies 20 percent ±	1,111,463
Subtotal	6,669,000
Engineering and Design 18 percent ±	1,200,000
Supervision and Inspection (0.080)	534,000
Overhead	399,000
E&D (0.1900) = 238,000	
S&I (0.3200) - 146,000	
Total Federal Cost	8,802,000
Non-Federal Costs	
Lands and Damages (including contingencies	2,376,610
Utility Relocations	63,500
Contingencies at 20 percent ±	12,890
Total Non-Federal Cost	2,453,000
Total First Cost	11,255,000

Total Contractor's Earnings Plus Contingencies		6,669,000
Engineering and Design		
$6,669,000 (0.18)	=	1,200,000
Supervision and Administration		
Supervision and Inspection		
$6,669,000 (0.08)	= $534,000	
Overhead		
E&D $1,200,000 (0.19) = $228,000		
S&I $534,000 (0.32) = 171,000		
	399,000	
		933,000

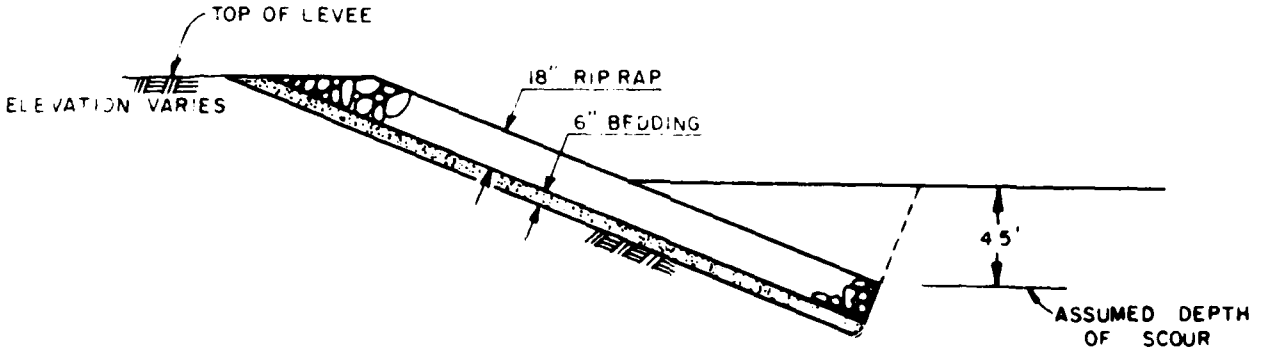
Table A24 - Average Annual Cost - SPF

Item	Amount
Federal	
First Cost	8,802,000
Interest During Construction	0
	8,802,000
Annual Charges	
Interest (7-3/8 percent)	649,100
Amortization	19,100
Maintenance 1/	10,200
Subtotal	678,400
Non-Federal	
First Cost	2,453,000
Interest During Construction	0
	2,453,000
Annual Charges	
Interest (7-3/8 percent)	180,900
Amortization	5,300
Maintenance 2/	169,800
Subtotal	356,000
Total Annual Cost	1,034,400

1/ $300 inspection, $9,900 gage operation.
2/ Includes $1,000 for the flood warning system maintenance.

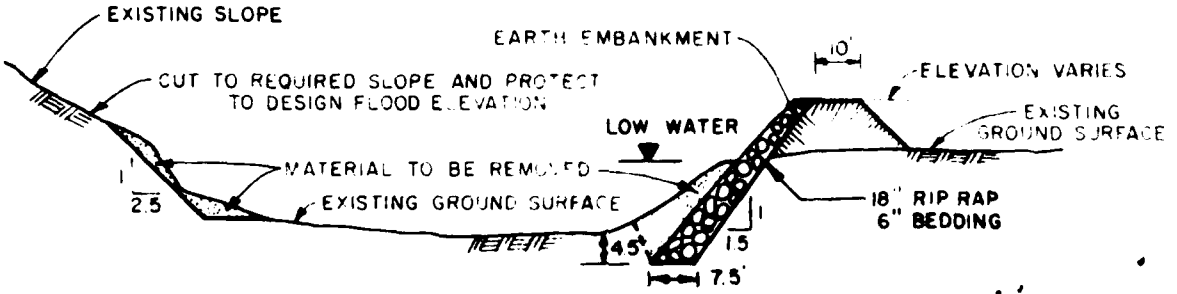


TYPICAL SECTION THROUGH LEVEE



TYPICAL LEVEE SECTION WITH RIP RAP

METHOD A
EM-1110-2-1601, APPENDIX III



TYPICAL SECTION THROUGH CHANNEL WITH LEVEE

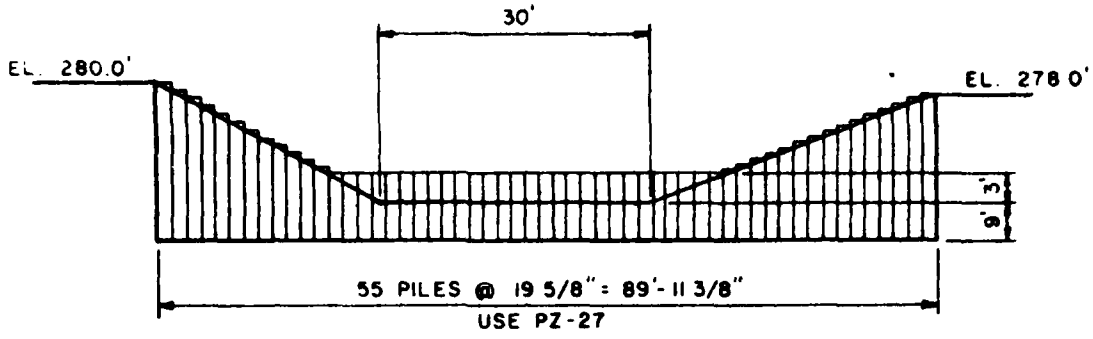
METHOD D
EM-1110-2-1601, APPENDIX III

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

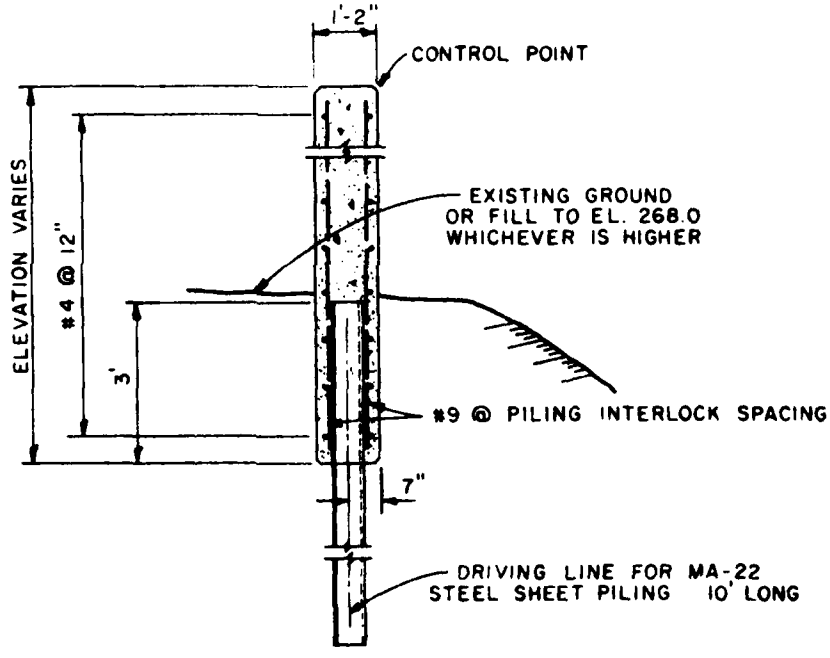
TYPICAL CROSS SECTIONS

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE A1



3' DROP STRUCTURE @ STA. 8+50 ALLEN CREEK



TYPICAL I-WALL (FLOODWALL)

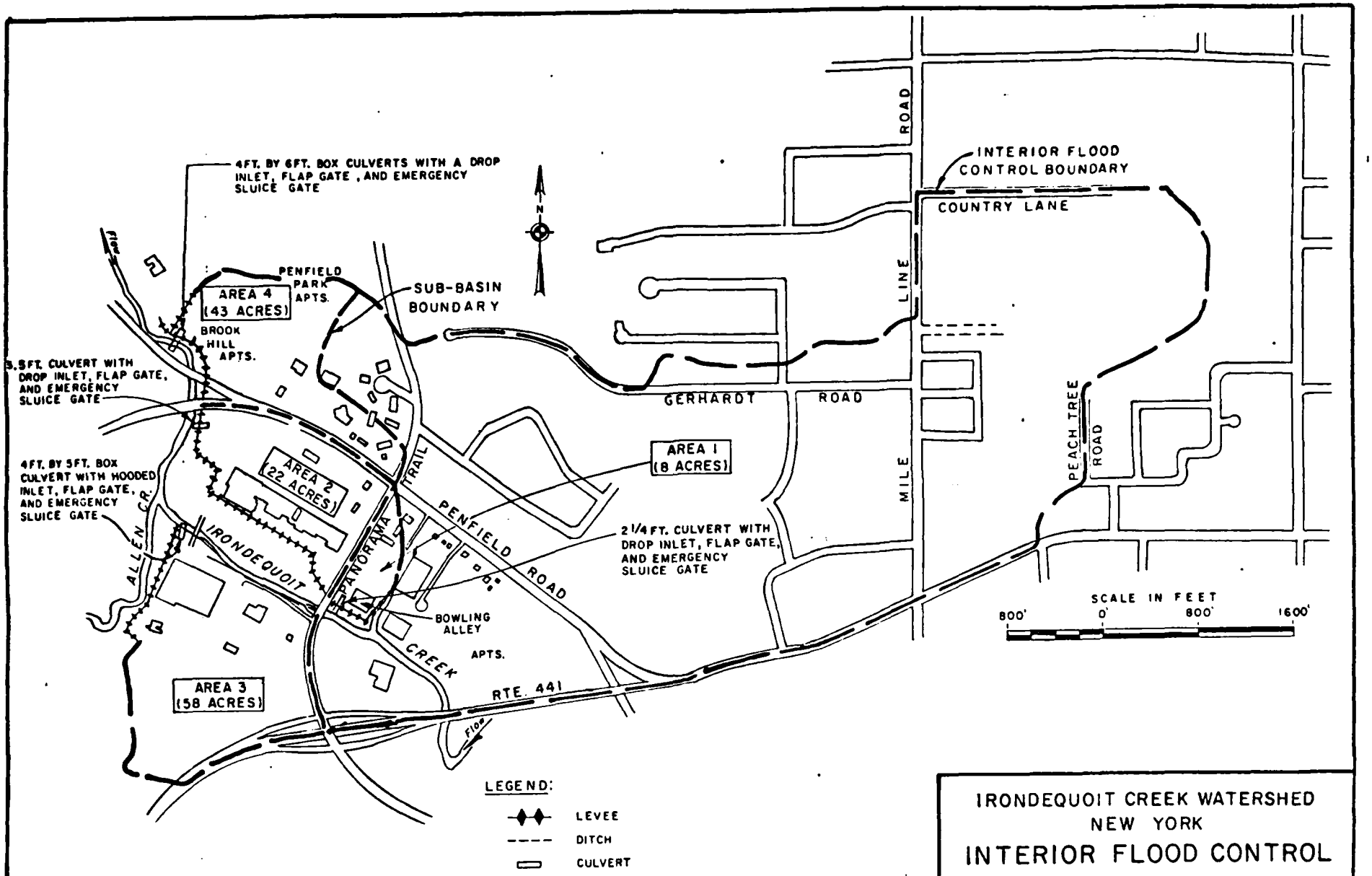
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

TYPICAL CROSS SECTIONS

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE A2



IRONDEQUOIT CREEK WATERSHED
NEW YORK

INTERIOR FLOOD CONTROL IRONDEQUOIT CREEK

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

PLATE A3

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX B
ECONOMIC EVALUATION

U. S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

APPENDIX B

ECONOMIC EVALUATION

TABLE OF CONTENTS

Paragraph	Description	Page
B1	THE AFFECTED AREA	B-1
B2	DETERMINATION OF FLOOD PLAIN CHARACTERISTICS	B-3
	a. Inherent Characteristics of a Flood Plain	B-3
	(1) Flooding	B-3
	(2) Natural and Beneficial Values	B-4
	(3) Transportation	B-5
	b. Physical Characteristics	B-5
	c. Available Services	B-6
	(1) Power	B-6
	(2) Water Supply	B-6
	(3) Sanitary Sewer Service	B-6
	d. Existing Activities	B-7
	(1) Residential	B-7
	(2) Commercial	B-7
	(3) Industrial	B-7
	(4) Public and Other	B-7
B3	PROJECTION OF LAND USE FOR WITH AND WITHOUT PROJECT CONDITIONS	B-9
B4	FLOOD DAMAGES AND BENEFITS	B-10
	a. Existing Conditions	B-10
	b. Flood Damage	B-11
	c. Future Conditions	B-12
	(1) Residential	B-12
	(2) Projection of Emergency Costs	B-15
	d. Total Benefits	B-15

TABLE OF CONTENTS (Cont'd)

Paragraph	Description	Page
	e. Measures of Economic Efficiency	B-22
	(1) Benefit/Cost Analysis	B-22
	(2) Undiscounted Payback Period	B-22
	(3) Discounted Payback Period	B-22
	f. Sensitivity Analysis	B-22

TABLES

Table No.	Description	Page
B1	Existing Land Use for Panorama Plaza and Vicinity, Current Conditions of Development	B-2
B2	Estimated Market Value of Damageable Property in the Project Area	B-8
B3	Estimated Average Annual Damages (September 1977 Price Levels)	B-13
B4	Estimated Average Annual Damages (February 1980 Price Levels)	B-14
B5	Projection of Existing Flood Damage by Decade with Affluence - Alternative Levels of Protection (February 1980 Price Levels)	B-16
B6	Projection of Residual Flood Damage by Decade with Affluence - Alternate Levels of Protection	B-17, 18
B7	Projection of Benefits by Decade with Affluence - Alternate Levels of Protection	B-19, 20
B8	Summary of Average Annual Benefits (February 1980 Price Levels)	B-21
B9	Summary of First Cost, Annual Cost, and Total Annual Benefits for Alternate Levels of Protection	B-24
B10	Comparison of Existing Average Annual Benefits and Annual Costs	B-25

TABLE OF CONTENTS (Cont'd)

PLATES

Plate No.	Description
B1	Illustration of Irondequoit Creek Watershed
B2	Land Use, Panorama Plaza Area
B3	Highway Network
B4	Areas Serviced by Pure Waters and Unsewered Areas
B5	Stage-Damage Curve, Reach I
B6	Stage-Damage Curve, Reach II
B7	Stage-Damage Curve, Reach III

ADDENDUM TO APPENDIX B
FLOOD DAMAGE SURVEY DATA

FACT SHEET

PROJECT INTEREST RATE	7-3/8 percent
PROJECT EVALUATION PERIOD	1985 - 2035
PRICE LEVEL	March 1981
CONDITIONS OF DEVELOPMENT	April 1979
PROJECT ECONOMISTS	Jack Carr, Economist Ray Waxmonsky, Economist Ron Guido, Chief, Economics Section

ALTERNATIVE DEGREES OF PROTECTION	50-YEAR	100-YEAR	500-YEAR	SPF
Average Annual Costs	427,200	436,000	456,700	1,034,400
Average Annual Benefits	630,810	678,180	743,190	764,040
Net Benefits	203,610	242,180	286,490	-270,360
B/C Ratios	1.48	1.56	1.63	.74

IRONDEQUOIT CREEK WATERSHED, NEW YORK

APPENDIX B
ECONOMIC EVALUATION

B1. THE AFFECTED AREA

B1.1 The Irondequoit Creek Watershed is roughly triangular in shape and located east and southeast of the city of Rochester, NY. It drains an area of 139.0 square miles in Monroe, Ontario, and Wayne Counties. The basin shown in Plate B1 is about 16.5 miles in length, north to south, and 12 miles in width. The watershed is bounded by Irondequoit Bay on the north, the city of Rochester on the northwest, and by various towns and villages in the remaining areas. The central portion of the watershed is traversed by the east-west New York State Barge Canal and the New York State Thruway. The drainage area of Irondequoit Creek downstream and upstream of Allen Creek is 130.9 and 102.9 square miles, respectively.

B1.2 The watershed is comprised of three main creeks, Irondequoit, Allen, and Thomas, as well as 40 smaller creeks and streams. Irondequoit Creek's headwaters arise in the town of West Bloomfield, Ontario County, at elevation 780 feet msl, and drops to an elevation of 245 feet above msl at its mouth, the south end of the Irondequoit Bay. The creek flows generally south to north, with its main stem almost 32 miles in length with gradients of 20 feet/mile above the Barge Canal and 11 feet/mile below it. Irondequoit Creek is joined by Allen Creek at 5.53 miles and Thomas Creek at 9.79 miles upstream of its mouth. Allen Creek originates in central Monroe County at an elevation of 525 feet above msl and crosses under the Barge Canal as it flows north, then east. It encompasses a drainage area of 31 square miles and empties into Irondequoit Creek at elevation 258. Thomas Creek arises at an elevation of 500 feet in eastern Monroe County, flowing south, then west, paralleling the Barge Canal, before draining 28 square miles and discharging to Irondequoit Creek at an elevation of 366 feet above msl.

B1.3 The only significant area of flooding along Irondequoit Creek resulting in damages occurs between Route 441 and the Old Penfield Bridge. This area, known as Panorama Plaza (see Plate B2), is a moderate-sized collection of commercial outlets with related facilities in and around it. These related facilities include a movie theater, bowling alley, supermarkets, fast food restaurants, automobile service stations, and other commercial outlets. Also, there are some apartments, small office buildings, and manufacturing structures. The flooding is directly related to Allen Creek's discharge to Irondequoit Creek and the resultant backwater effects upstream on each creek. The plaza, opposite of Allen Creek, is in a low, natural flood plain, immediately adjacent to the right bank of Irondequoit Creek. This area receives the brunt of the high creek stages. Due to its predominantly commercial and industrial nature, the damages of even a minor flood can be high. The analysis which follows will deal solely with the 150-acre Panorama Plaza Area which will be subsequently defined and delineated.

B1.4 The affected area of the proposed flood control project is the flood plain plus all other areas considered to be alternative sites for any

activity which might use the flood plain if it were protected. There is considerable commercial-industrial development within the flood hazard zone, although minor acreages of residential and vacant lands are also periodically inundated. There is no agricultural activity within the project limits.

B1.5 The affected area for each major category was determined by examining the present land use pattern within the study area. A summary of land use patterns within the project area is shown in Table B1 and Plate B2. Plate B1 illustrates the location of the Panorama Plaza area within the Irondequoit Creek Watershed and within the town of Penfield. The major categories of land use within the floodprone area includes residential, commercial, industrial, public and other. Flood outlines for the 500-year and SPF flood are shown on Plate 1 of the Main Report. The SPF flood outline is the boundary of the Panorama Plaza area designated in Table B1.

Table B1 - Existing Land Use for Panorama Plaza and Vicinity, Current Conditions of Development

Economic Activity	Area in Acres
Commercial	84
Manufacturing	24
Residential	23
Vacant	14
Parks and Recreation	5
Agriculture and Other	0
Total	150

B2. DETERMINATION OF FLOOD PLAIN CHARACTERISTICS

B2.1 Of essential importance in any physical planning effort is a map and tabulation of the present uses of land. Such information is needed in order to provide the basis for making projections of future land use needs, to identify significant characteristics of the community, and to point out significant land use problems and issues. Specifically, a land use inventory is designed to provide information on the location, extent, and type of each land use.

B2.2 An inventory of the physical and economic characteristics of the study area was undertaken to determine those features that make it attractive or unattractive for future land use demands.

a. Inherent Characteristics of a Flood Plain

B2.3 Those characteristics which make the flood plain attractive or unattractive to potential developers include: flooding; natural, and beneficial values including open space, recreation, wildlife, and wetlands; transportation, and other attributes.

(1) Flooding

B2.4 There is little definitive historical record of flood events for the Irondequoit Creek Watershed. This is most likely due to the lack of gauging records prior to 1959, and apparent rural, low-population density within the flood plains of the watershed prior to the 1950's. A chronology of known past floods is provided below.

May 1864 - This was the largest known flood to date. A heavy rain and subsequent overbank flows caused considerable damage to flour and saw mills adjacent to the creek in the Penfield area.

September 1912 - A flood resulted from a break in the Barge Canal at the crossing over Irondequoit Creek. The escaping canal water washed out about 500 feet of embankment and the Barge Canal was inoperable for over a month.

Spring 1934 - This flood was caused by a sudden thaw after a cold spell. Chunks of ice took out the Daisy Flour Mill dam in Penfield near Ellison Park, forcing them to change to diesel power.

31 March 1960 - This is the major recent flood event that has, at best, a sketchy historical record. It has been determined that in other local drainage basins, such as Black Creek and Oatka Creek, which are tributaries of the Genesee River in western Monroe County, and the Lower Genesee River basin, the March 1960 flood was approximately a 15-year event on Allen Creek. Considerable damage was caused in the Panorama Plaza area of Penfield.

May 1974 - Irondequoit Creek flooded as a result of thunderstorms which dropped from 3 inches to 4 inches of rain. The Panorama Plaza area of Penfield was hardest hit. The basements of a recently constructed apartment development were flooded to a depth of 6 to 7 feet. Property damage was very

high with numerous buildings and cars being flooded. This was a localized storm with the greatest rainfall occurring over the Allen Creek Watershed of Irondequoit Creek in northeast Monroe County. The May 1974 flood was approximately a 50-year event on Allen Creek.

October 1974 - A collapse in the bottom of the Barge Canal at the Interstate 490 overpass in the Bushnell Basin area caused severe local flooding with great property damage. A number of homes immediately downstream from the breach in the canal were completely destroyed from the sudden surge of water into the low-lying area. The flood profile at the nearby Interstate 490 and Pittsford-Palmyra Road bridges on Irondequoit Creek approximated that of the 100-year frequency flood event.

March 1976 - On 3 and 4 March 1976, about 0.7 inches of rain combined with 3 inches of snow on the ground to produce flooding along Irondequoit Creek. On 3 March 1976, the weather conditions were mixed, with heavy fog, thunderstorms, ice pellets, glaze and rain, and above freezing temperatures. On 4 March 1976, above freezing temperatures and heavy fog was prevalent. In the Panorama Plaza Area, the flooding was confined to parking lots and streets. No physical damage was reported.

A further discussion of flooding within the Irondequoit Creek Watershed can be found in the Hydrologic Engineering and Hydraulic Design Appendix to this report.

(2) Natural and Beneficial Values Including Open Space, Recreation, Wildlife, and Wetlands

B2.5 The area of the flood plain occupied by parkland and open space is delineated in Plate B2. Parks and recreation area comprise 5 acres in the study area as previously identified. Camp Haccamo, a day camp, is located adjacent to Allen Creek near the Sybron-Nagle buildings. The day camp is operated seasonally by several Rotary Clubs of Monroe County and serves handicapped children from the Monroe County area. Some of the facilities provided are a small lake, swimming pool, cabins, dining hall, picnic shelters, and playground. The Genesee Conservation League is a private recreational facility located north of Old Penfield Road adjacent to Irondequoit Creek. The private facility contains a clubhouse, picnic shelters, archery range, rifle range, and indoor and outdoor pistol ranges.

B2.6 Industrially zoned vacant land located behind the Panorama Plaza accounts for approximately 12 acres of the study area. The town of Penfield Parks and Recreation Department is currently in the planning stage to develop a town park in the open land behind Panorama Plaza. Most of the land has been pledged by the landowners for donation to the town for park development. The park will be constructed in the near future. The preliminary plans indicate two multipurpose fields, a baseball diamond, and a playground/picnic area. An additional 2 acres of vacant land is identified in the study area as located immediately north of New York Route 441 along Irondequoit Creek, and west of the Penwood Apartments. No wetland has been identified in the Panorama Plaza study area.

(3) Transportation

B2.7 The transportation system is part of the basic infrastructure around which a community grows. An important objective of community planning is to provide an efficient transportation system designed to serve the present and future needs of the community. The adequacy of the transportation system has influenced, and will continue to influence, development within the Panorama Plaza area. The transportation network determines the accessibility of the area and the efficiency of internal traffic movements, both of which are important factors in anticipating future development potential. Also, the integration of the various modes of transportation with emphasis on mass transit facilities is essential to a balanced transportation system.

B2.8 Transportation in the Rochester area is provided by an excellent transportation network that includes several limited-access, high-speed highways; several railroads; waterborne commerce facilities using Rochester Harbor, and the Erie Barge Canal; and three major airlines. More than 100 trucking companies serve the county area, and buslines provide passenger service between the city of Rochester and outlying towns. Plate 3 illustrates the system of major highways connecting the project area with the city of Rochester. Highways are the only means of transportation available within the Panorama Plaza area. It should be noted that regularly scheduled bus service is available between the Panorama Plaza area and the city of Rochester.

b. Physical Characteristics

B2.9 The existence of certain physical characteristics may preclude use by some activities likely to compete for vacant flood plain areas. One of the major physical constraints of vacant acreage within the Panorama Plaza flood plain is the relatively small size. The total land available (vacant) is only 14 acres as illustrated in Table B1. One parcel, comprised of 12 acres and located directly behind the Panorama Plaza, has been designated as a town park by the town of Penfield. The remaining 2-acre parcel of vacant land located northwest of the Penwood Apartments is identified on Plate B2.

B2.10 Irondequoit Creek's drainage area measures approximately 139 square miles and meanders through a generally narrow gorge about 150-200 feet wide between steep hills for most of its 32-mile length. Unique glacial geologic features such as kames and drumlins (rounded hills of glacial material) are also in the area, being more predominant in the southern end of the basin. The watershed is marked by two plains rising progressively above one another southward. Two prominent west tending escarpments mark the plain's boundaries. The soils which make possible the growing of fruits and vegetables and also provide pasture for dairying are a valuable resource here. Soils are formed through the interaction of climate, plant and animal life, parent material, topography, and time. The relative influence of each factor varies from place to place within the watershed. The geologic content of the basin varies significantly, but the creek bottoms are composed mainly of sandy or gravel-like soils or light, easily worked surface soils grading downward into sandy and gravel-like friable subsoils. The major inputs for the main tributaries are surface runoff and groundwater discharge (either as

springs or bank discharge). These are mainly controlled by amount and duration of precipitation. It appears that the groundwater table generally follows the topography of the area. The underlying bedrock surface is fairly impervious and thus controls the leakage of groundwater to deeper parts of the system. While there are some scattered lakes and ponds, the New York State Barge Canal and Mendon Ponds are the only inland bodies of water with any significant size.

c. Available Services

B2.11 A principal factor to be considered in planning for new development is the impact of existing services or facilities. Most activities require some or all of the following services: power, water, sanitary sewer service.

B2.12 The availability of such services serve to attract or deter future land use activities. Services available on or near the Panorama Plaza area and Irondequoit Creek flood plain are discussed and delineated in this section of the report.

(1) Power

B2.13 The normal low, dry weather flows and the flash flood flow characteristics of the creeks and streams in the watershed, and the general lack of steep stream slopes, make production of hydroelectric power economically impractical. During the 19th and 20th century, however, many small mills existed along the creek utilizing waterpower. Gas and electric is provided to Panorama Plaza area by Rochester Gas and Electric Company.

(2) Water Supply

B2.14 The domestic water supply in the southern rural areas of the watershed comes from deep wells in both rock and unconsolidated deposits. Wells are also the main source of water for the towns and villages, except those near Lake Ontario or those suburbs of Rochester that are served by the municipal water system. In many places, wells are not always adequate during prolonged dry periods. Also, the water in the area frequently contains sulfur, and high concentrations of salts, and is hard. The water supply for the city of Rochester comes from Hemlock Lake and other upland reservoirs, as well as directly from Lake Ontario. Much of the water for the suburbs of Rochester also comes from Lake Ontario via the rapidly expanding Monroe County Water Authority.

(3) Sanitary Sewer Service

B2.15 The Panorama Plaza area and surrounding area, which includes the towns of Pittsford, Penfield, and Perinton, is serviced by Monroe County Division of Pure Waters. Plate B4 illustrates areas serviced by pure waters and unsewered areas.

d. Existing Activities

B2.16 The land use in the Panorama Plaza portion of the flood plain includes residential, commercial, public and other, and industrial use. To further illustrate existing activities in the Panorama Plaza area, Table B2 shows market value of damageable property in the Panorama Plaza area. A further delineation of existing land use in the Panorama Plaza study area follows, and is also delineated in Plate B2. The study area is divided into three hydraulic reaches as delineated in Plate B2.

(1) Residential

B2.17 Residential activity in the project area consists primarily of the multifamily units of the Brook Hill and Penfield Park Apartments located in Reach No. 1 of the Panorama Plaza study area.

(2) Commercial

B2.18 Commercial activity in the Panorama Plaza area is concentrated in Reach No. 2 and consists of the retail stores of Panorama Plaza and surrounding development.

(3) Industrial

B2.19 Industrial development is concentrated in Reach No. 3 and consists of Sybron-Nagle Corporation, Winross Corporation, and Seneca Metal Corporation.

(4) Public and Other

B2.20 Public and other activity subject to flood damage is limited to Reach 2 of the study area. Public and other structures subject to damage include the U. S. Post Office, Monroe County License Bureau, pump station (Old Sewage Treatment Plant), and Rochester Gas and Electric transformer.

Table B2 - Estimated Market Value of Damageable Property (Structures) In The Project Area

Category	Units	Value
		$
Residential	200	4,000,000
Apartments	200	4,000,000
Commercial	44	7,799,290
Panorama Plaza	1	4,542,400
Other	43	3,256,890
Industrial	5	3,960,000
Public	1	46,400
Total	250	15,805,690

1978 Conditions of Development and 1977 Price Levels

Source: Reconnaissance Report by Buffalo District, Corps of Engineers

B3. PROJECTION OF LAND USE FOR WITH AND WITHOUT PROJECT CONDITIONS

B3.1 Given the existing characteristics of the flood plain and the remainder of the affected area, the Irondequoit Creek Watershed as shown in Plate B1, land use demand must be allocated to flood plain and nonflood plain lands, with and without each specific flood plain management plan.

B3.2 The allocation shall be based upon a comparison of three sets of factors. They are: the flood plain characteristics, the characteristics sought by potential occupants, and the availability of sought after characteristics within the Panorama Plaza area and within the towns of Pittsford, Penfield, Perinton, and Brighton which comprise the Irondequoit Creek Watershed.

B3.3 The principle of economic rationality shall be applied. That is, the flood plain will not be used unless it possesses characteristics which give it a significant economic advantage over all other available sites within the affected area. Since the original damage survey, an additional 4 acres have been developed for commercial purposes. Of the 14 acres vacant land remaining in the Panorama Plaza Study area, 12 acres have been designated primarily for a park, plus some land too small, with too steep slope and/or unaccessible. The remaining 2 acres of vacant land are assumed to be suitable for industrial/commercial development. The 12 acres designated for a park by the town of Penfield are located directly behind the Panorama Plaza. The two remaining vacant acres are located immediately north of Irondequoit Creek and New York Route 441 and directly west of the Penwood Apartments as identified in Plate B2. For the purpose of our analysis, it will be assumed that the remaining 2 acres will remain vacant. This is because: the site is too small for a typical suburban industrial development and/or a large commercial establishment; location is poor for a large commercial establishment; and development of the site will not generate significant additional damages if developed.

B3.4 The Panorama Plaza study area in the project area is very small, approximately 150 acres. Fourteen acres of the 150-acre study area are currently vacant. Twelve vacant acres have been designated for a town park and the remaining 2 acres will remain vacant as explained in the previous paragraph.

B3.5 For the purpose of this analysis, no future development of the flood plain in the study area is anticipated. This is because of the availability of more desirable alternative sites for development, and because the existing 150 acres which comprise the study area are considered fully developed as previously explained in this report. Therefore, residential, commercial, industrial land demand will have to be satisfied by areas outside the Panorama Plaza study area. Specifically, the towns of Pittsford, Penfield, and Perinton outside the study area are expected to satisfy the future land demand for residential, commercial, and industrial activity.

B4. FLOOD DAMAGES AND BENEFITS

B4.1 The previous section evaluated future flood plain land use, and indicated that no significant future change is expected. Therefore, the majority of flood damages and benefits would be borne by existing inhabitants of the flood plain. This study is based on the premise of no future development in the flood plain. Existing benefits are primarily inundation reduction benefits accruing to the commercial, industrial, public, and residential development in the Panorama Plaza area. Future benefits result from damage reduction to the increased content value of residential inhabitants of the Panorama Plaza study area.

a. Existing Conditions

B4.2 Flood Damage Reduction Benefit. Existing flood damages are the potential average annual dollar damages to activities affected by flooding at the time of the study. The inundation reduction benefit is the value of reducing flood losses to existing activities. This benefit is measured by subtracting the amount of residual average annual damages under improved conditions from average annual damages under existing conditions. Flood damages and benefits developed in this section reflect April 1979 conditions of development and September 1977 price levels. The Preliminary Feasibility Report considered a total of seven structural and nonstructural alternatives, all of which were subsequently eliminated, with the exception of Alternative B, which is carried over to the Final Feasibility study. This is a structural alternative that would provide flood control with levee, floodwall, and channelization improvements. This alternative was designed for varying levels of protection, using 50-, 100-, 500-year and Standard Project Flood (SPF) protection levels. These various levels of protection are evaluated in this analysis.

B4.3 Description of Damage Reaches. The flood plain has been divided into three damage reaches for economic evaluation purposes. Reach 1 is located downstream of the confluence of Irondequoit and Allen Creeks and represents a residential damage reach. Reach 2 represents damages of a public and commercial nature and is located upstream of the confluence of Irondequoit and Allen Creeks. Reach 3 represents damages to industrial activity and is located along Allen Creek. Plate B2 illustrates the three damage reaches in the Panorama Plaza study area. To facilitate the average annual damage calculation in this study, all damages in reaches 1 and 2 have been attributed to Irondequoit Creek. All damages in reach 3 have been attributed to Allen Creek.

B4.4 It must be noted here, that while the damages occurring in reaches 1 and 2 have been attributed to Irondequoit Creek in this analysis, the effect of Allen Creek is recognized. The structures located on the left bank of Irondequoit and the right bank of Allen at the junction of these two creeks have the potential to be affected by flood stages of either creek. It is realized that, due to the noncoincident frequencies of the two streams, Allen Creek is capable of having a more damaging flood than that of Irondequoit Creek due to its smaller channel capacity and independent drainage basin. The discharge on Allen Creek for the 100-year event has been

estimated to be 3,800 cfs while the same event for Irondequoit Creek is 5,000 cfs. Upstream of their confluence, the two watersheds can respond differently to a rainstorm and may be affected by independent events. At this level of study, the combined effects of flooding of Allen and Irondequoit Creeks is not considered.

B4.5 Damage Survey. Damage surveys performed by Buffalo District in 1977 were the basis of calculating existing damages. The damage survey is based upon personal interviews and field observation of activities in the flood plain area. Tables summarizing results of the damage survey are included as an addendum to this appendix.

b. Flood Damage.

B4.6 Methodology. The stage-damage relationship was established for the reaches for manufacturing, commercial, public, and residential damage categories. Damage estimates were obtained via personal interview with flood plain occupants. An index point was selected for each of the three damage reaches as a point at which changes in water surface elevations would be representative throughout the reach. The index point chosen for reach number 1 is located 100 feet downstream of the Old Penfield Road. The index point chosen for reach number 2 is located 1,000 feet downstream of Panorama Trail. The index point chosen for reach number 3 is located 700 feet upstream of the confluence of Allen and Irondequoit Creeks. Expected annual damage is the frequency weighted sum of damage for the full range of damaging flood events that can be viewed as what might be expected to occur in any present or future year. With the aid of HEC computer program, expected annual damages were computed for each input data year, the study year, the base year, and each decade year by first computing a damage-frequency relationship from discharge-frequency, stage-discharge (rating curve), and stage-damage curves developed by the Buffalo District for each plan, reach, and damage category.

B4.7 Stage-Damage Relationship. The expected damages at various stages were developed by Buffalo District's Hydraulic Engineering Section in December 1977. The damages are based on stages at the index points described in the previous paragraph. Plates B5, B6, and B7 illustrate graphically stage-damage relationships by reach and activity type.

B4.8 Discharge-frequency relationships for each reach were developed by the Buffalo District based on index points previously described. A discharge-frequency relationship for a reach of creek represents the percent chance that a certain magnitude of the creek flow be exceeded.

B4.9 Stage-Discharge (Rating Curve). Stage-discharge relationships for each reach based on index points previously described were developed by the Buffalo District. The stage-discharge relationship relates the stage or water surface elevation of a creek at a specific location to the flow of the creek at that location. One stage-discharge relationship was assumed representative of each reach. A description of the location of gauging stations on Allen and Irondequoit Creeks and Plates illustrating water surface profiles for both creeks can be found in the hydraulics and hydrology appendix.

B4.10 Existing Average Annual Damages, Existing Conditions. For each reach and activity type discharge-frequency curves and stage-discharge curves were used in conjunction with stage-damage curves to determine the damage-frequency relationship under existing conditions. Existing average annual damages derived from the damage-frequency relationship by reach and activity type are shown in Table B3 at September 1977 price levels and in Table B4 updated to March 1981 price levels. As illustrated, existing average annual damages amount to $759,430 at March 1981 price levels.

B4.11 Residual Average Annual Damages. Residual average annual damages have been computed for all plans of improvement. Discharge-frequency curves and stage-discharge curves reflecting improved conditions, were used in conjunction with stage-damage curves to determine the damage-frequency relationship for various plans of improvement. These damages by activity type and reach are shown in Table B3 at September 1977 price levels and in Table B4 updated to March 1981 price levels. It should be noted that there are no residual damages associated with the alternative providing standard project flood level of protection. The inundation reduction benefit by activity type and reach are also illustrated in Table B3 at September 1977 price levels and Table B4 updated to March 1981 price levels. The inundation reduction benefit associated with the 500-year level of protection at March 1981 price levels amounts to $738,650.

c. Future Conditions

B4.11 An evaluation of the potential for future growth in flood plain activity indicated that no change in flood plain land use is expected, as the flood plain is considered fully developed. However, future damages will rise based upon the increased value of contents of residential facilities within the flood plain. Future benefits have been evaluated for residential activities.

(1) Residential

B4.12 The value of residential contents is expected to increase as a result of rising regional per capita income. As more people have more money available for personal consumption, the value of their stock of personal property increases. This increase in value is a direct result of regional per capita income gains. The methodology used to calculate this residential affluence follows.

B4.13 OBERS Series E projections forecast constant dollar per capita income to grow from $5,400 in 1980 to $14,500 in 2020. This is largely attributed to a higher percentage of the population in the work force as the average age of the population increases and the entrance of more women in the work force. Therefore, per capita income will increase 2.685 times in 40 years. The 40th root of 2.685 is equal to 1.025. Therefore, annual compound growth rate is .025 (2.5 percent). It is assumed that residential content value growth rate is equal to regional per capita income growth rate.

B4.14 It was estimated that residential content value is currently 30 percent of structural value. Principles and Standards declares that the maximum value of contents that may be used for flood control evaluation is 75

Table B3 - Estimated Average Annual Damages
(September 1977 Price Levels)

Benefit Category by Property Type	Existing Conditions	Residual Damages Under Improved Conditions				Existing Inundation Reduction Benefit			
		50 years	100 years	500 years	SPF	50 years	100 years	500 years	SPF
	$	$	$	$	$	$	$	$	$
REACH 1									
Residential									
Contents	5,460	550	340	80	1/	4,910	5,120	5,380	5,460
Structure	7,540	760	480	120	1/	6,780	7,060	7,420	7,540
Total	13,000	1,310	820	200	1/	11,690	12,180	12,800	13,000
REACH 2									
Commercial									
Contents	130,900	33,760	23,500	5,900	1/	97,140	107,400	125,000	130,900
Structure-Other	125,300	28,350	19,370	4,860	1/	96,950	105,930	120,440	125,300
Total	256,200	62,110	42,870	10,760	1/	194,090	213,330	245,440	256,200
Public and Other	83,800	5,460	3,170	740	1/	78,340	80,630	83,060	83,800
Total	340,000	67,570	46,040	11,500	1/	272,430	293,960	328,500	340,000
REACH 3									
Industrial									
Content	100,620	13,800	7,620	1,680	1/	86,820	93,000	98,940	100,620
Structure-Other	96,680	13,250	7,330	1,620	1/	83,430	89,350	95,060	96,680
Total	197,300	27,050	14,950	3,300	1/	170,250	182,350	194,000	197,300
Total Damages	550,300	95,930	61,810	15,000	1/	454,370	488,490	535,300	550,300

1/ There are minimal residual damages with SPF level of protection.

Table B4 - Estimated Average Annual Damages
(March 1981 Price Levels)

Benefit Category by Property Type	Existing Conditions	Residual Damages Under Improved Conditions				Existing Inundation Reduction Benefit			
		50 years	100 years	500 years	SPF	50 years	100 years	500 years	SPF
	$	$	$	$	$	$	$	$	$
REACH 1									
Residential									
Contents	7,330	740	460	110	1/	6,590	6,870	7,220	7,330
Structure	9,800	990	620	160	1/	8,810	9,180	9,640	9,800
Total	17,130	1,730	1,080	270	1/	15,400	16,050	16,860	17,130
REACH 2									
Commercial									
Contents	191,240	49,320	34,330	8,620	1/	141,920	156,910	182,620	191,240
Structure	162,390	36,740	25,100	6,300	1/	125,650	137,290	156,090	162,390
Total	353,630	86,060	59,430	14,920	1/	267,570	294,200	338,710	353,630
Public and Other	115,560	7,530	4,370	1,020	1/	108,030	111,190	114,540	115,560
Total	469,190	93,590	63,800	15,940	1/	375,600	405,390	453,250	469,190
REACH 3									
Industrial									
Contents	147,810	20,270	11,190	2,470	1/	127,540	136,620	145,340	147,810
Structure	125,300	17,170	9,500	2,100	1/	108,130	115,800	123,200	125,300
Total	273,110	37,440	20,690	4,570	1/	235,670	252,420	268,540	273,110
Total Damages	759,430	132,760	85,570	20,780	1/	626,670	673,860	738,650	759,430

1/ There are minimal residual damages with SPF level of protection.

percent of structure value. Therefore, at 2.5 percent compound rate of growth, residential content value will increase from 30 percent to 75 percent of structural value in 37 years. This calculation is shown below:

$$(1+r)^n = X_t/X_i$$

$$n = \frac{\ln (Xt+/Xi)}{\ln (1 + r)}$$

$$n = \frac{\ln (.75/.30)}{\ln (1.025)}$$

$$n = \frac{.9163}{.025} = 37 \text{ years}$$

where n = number of years residential contents will increase in value
r = compound growth rate (2.5 percent)
X_t = ratio of content value to structural value in the terminal year of growth (75 percent)
X_i = ratio of content value to structural value in the initial year of growth (30 percent)

B4.15 A review of the damage survey indicated that 42 percent of total residential damage was attributed to residential contents. Tables B5 through B6 show projected growth of residential content damage (existing and residual) for 37 years from 1979 to 2016 (damages are based on 1979 conditions of development). Since 1985 is the project base year, it can be stated that residential content value and residential content damages and benefits will grow for 31 years referenced to economic base year 1985.

B4.16 Table B7 shows projected residential benefits over the 50-year project with 31 years of growth in content benefits (affluence) for each level of protection. Table B8 presents average annual residential affluence benefits which are the benefit attributable solely to increase residential content value over time. Affluence benefits attributed to the 500-year level of protection amount to $3,390.

(2) Projection of Emergency Costs

B4.17 Emergency costs encompass a wide variety of programs. Some, such as detour and evacuation, are primarily a function of occupancy of the flood plain, but not of the value of development in the flood plain. It should be noted that emergency costs are included in public and other damages as delineated in this report. A summary of detour and emergency costs can be found in the U.S. Army Corps of Engineers Appendices of Flood Damage Survey in the Panorama Plaza Area, September 1977.

d. Total Benefits

B4.18 A summary of existing and future average annual benefits for each scheme of improvement is illustrated in Table B8. As previously delineated, Reach 1 includes all residential damages and benefits; Reach 2 includes all

Table B5 - Projection of Existing Flood Damage by Decade with Affluence - Alternative Levels of Protection (March 1981 Price Levels)

Applicable Discount Rate 7-3/8 Percent

Property Type	Existing (1979)	1985	1995	2005	2015	2025	2035	Average Annual Equivalent
Residential								
Contents	7,330	8,500	10,880	13,930	17,830	18,280	18,280	11,940 1/
Structure	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800
Total	17,130	18,300	20,680	23,730	27,630	28,080	28,080	21,740
Commercial	353,630	353,630	353,630	353,630	353,630	353,630	353,630	353,630
Public and Other	115,560	115,560	115,560	115,560	115,560	115,560	115,560	115,560
Industrial	273,110	273,110	273,110	273,110	273,110	273,110	273,110	273,110
Total	759,430	760,600	762,980	766,030	769,930	770,380	770,380	764,040

1/ 50-Year project, 31 years compound growth at 7-3/8 percent (.3517) referenced to economic base year 1985.

Table B6 - Projection of Residual Flood Damage Under Improved Conditions by Decade with Affluence - Alternative Levels of Protection (March 1981 Price Levels)

Applicable Discount Rate 7-3/8 Percent

50-Year Level of Protection	Existing March (1979)	1985	1995	2005	2015	2025	2035	Average Annual Equivalent
Residential								
Contents	740	860	1,100	1,410	1,800	1,850	1,850	1,210 1/
Structure	990	990	990	990	990	990	990	990
Total	1,730	1,850	2,090	2,400	2,700	2,840	2,840	2,200
Commercial	86,060	86,060	86,060	86,060	86,060	86,060	86,060	86,060
Public and Other	7,530	7,530	7,530	7,530	7,530	7,530	7,530	7,530
Industrial	37,440	37,440	37,440	37,440	37,440	37,440	37,440	37,440
Total	132,760	132,880	133,120	133,430	133,730	133,870	133,870	133,230

100-Year Level of Protection								
Residential								
Contents	460	530	680	870	1,120	1,150	1,150	750 1/
Structure	620	620	620	620	620	620	620	620
Total	1,080	1,150	1,300	1,490	1,740	1,770	1,770	1,370
Commercial	59,430	59,430	59,430	59,430	59,430	59,430	59,430	59,430
Public and Other	4,370	4,370	4,370	4,370	4,370	4,370	4,370	4,370
Industrial	20,690	20,690	20,690	20,690	20,690	20,690	20,690	20,690
Total	85,570	85,640	85,790	85,980	86,230	86,260	86,260	85,860

1/ 50-year project, 31 years compound growth at 7-3/8 percent (.3517) referenced to economic base year 1985.

Table B6 - Projection of Residual Flood Damage Under Improved Conditions by Decade with Affluence - Alternative Levels of Protection (March 1981 Price Levels) 1/ (Cont'd)

500-Year Level of Protection	Existing March (1979)	1985	1995	2005	2015	2025	2035	Average Annual Equivalent
Residential								
Contents	110	130	160	210	270	270	270	180 2/
Structure	160	160	160	160	160	160	160	160
Total	270	290	320	370	430	430	430	340
Commercial	14,920	14,920	14,920	14,920	14,920	14,920	14,920	14,920
Public and Other	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020
Industrial	4,570	4,570	4,570	4,570	4,570	4,570	4,570	4,570
Total	20,780	20,800	20,830	20,880	20,880	20,880	20,880	20,850

1/ There are no residual damages associated with SPF level of protection.

2/ 50-year project, 31 years compound growth at 7-3/8 percent (.3517) referenced to economic base year 1985.

Table B7 - Projection of Benefits by Decade with Affluence -
Alternative Levels of Protection (March 1981 Price Levels)

Appropriate Discount Rate 7-3/8 Percent

50-Year Level of Protection	Existing (1979)	1985	1995	2005	2015	2025	2035	Average Annual Equivalent
Residential								
Contents	6,590	7,640	9,780	12,520	16,030	16,430	16,430	10,730 1/
Structure	8,810	8,810	8,810	8,810	8,810	8,810	8,810	8,810
Total	15,400	16,450	18,590	21,330	24,840	25,240	25,240	19,540
Commercial	267,570	267,570	267,570	267,570	267,570	267,570	267,570	267,570
Public and Other	108,030	108,030	108,030	108,030	108,030	108,030	108,030	108,030
Industrial	235,670	235,670	235,670	235,670	235,670	235,670	235,670	235,670
Total	626,670	627,720	629,860	632,600	636,110	636,510	636,510	630,810

100-Year Level of Protection								
Residential								
Contents	6,870	7,970	10,200	13,060	16,710	17,130	17,130	11,190 1/
Structure	9,180	9,180	9,180	9,180	9,180	9,180	9,180	9,180
Total	16,050	17,150	19,380	22,240	25,890	26,310	26,310	20,370
Commercial	294,200	294,200	294,200	294,200	294,200	294,200	294,200	294,200
Public and Other	111,190	111,190	111,190	111,190	111,190	111,190	111,190	111,190
Industrial	252,420	252,420	252,420	252,420	252,420	252,420	252,420	252,420
Total	673,860	674,960	677,190	680,050	683,700	684,120	684,120	678,180

1/ 50-year project, 31 years compound growth at 7-3/8 percent (.3517) referenced to economic base year 1985.

Table B7 - Projection of Benefits by Decade with Affluence -
Alternative Levels of Protection (March 1981 Price Levels) 1/ (Cont'd)

Appropriate Discount Rate 7-3/8 Percent

500-Year Level of Protection	Existing March (1979)	1985	1995	2005	2015	2025	2035	Average Annual Equivalent
Residential								
Contents	7,220	8,370	10,720	13,720	17,560	18,000	18,000	11,760 1/
Structure	9,640	9,640	9,640	9,640	9,640	9,640	9,640	9,640
Total	16,860	18,010	20,360	23,360	27,200	27,640	27,640	21,400
Commercial	338,710	338,710	338,710	338,710	338,710	338,710	338,710	338,710
Public and Other	114,540	114,540	114,540	114,540	114,540	114,540	114,540	114,540
Industrial	268,540	268,540	268,540	268,540	268,540	268,540	268,540	268,540
Total	738,650	739,800	742,150	745,150	748,990	749,430	749,430	743,190

SPF Level of Protection								
Residential								
Contents	7,330	8,500	10,880	13,930	17,830	18,280	18,280	11,940 1/
Structure	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800
Total	17,130	18,300	20,680	23,730	27,630	28,080	28,080	21,740
Commercial	353,630	353,630	353,630	353,630	353,630	353,630	353,630	353,630
Public and Other	115,560	115,560	115,560	115,560	115,560	115,560	115,560	115,560
Industrial	273,110	273,110	273,110	273,110	273,110	273,110	273,110	273,110
Total	759,430	760,600	762,980	766,030	769,930	770,380	770,380	764,040

1/ 50-year project, 31 years compound growth at 7-3/8 percent (.3517) referenced to economic base year 1985.

Table B8 - Summary of Average Annual Benefits
(March 1981 Price Levels)

	Degrees of Protection			
	50-Year	100-Year	500-Year	SPF
	$	$	$	$
REACH 1				
Residential				
Inundation Reduction	16,450	17,150	18,010	18,300
Affluence	3,090	3,220	3,390	3,440
Total	19,540	20,370	21,400	21,740
REACH 2				
Commercial				
Inundation Reduction	267,570	294,200	338,710	353,630
Public and Other	108,030	111,190	114,540	115,560
Total	375,600	405,390	453,250	469,190
REACH 3				
Industrial				
Inundation Reduction	235,670	252,420	268,540	273,110
Total	630,810	678,180	743,190	764,040

commercial and public damages and benefits; and Reach 3 includes all industrial damages and benefits.

e. Economic Efficiency

(1) Benefit/Cost Analysis

B4.19 Table B9 presents a summary of first cost, annual cost, and annual benefits for 50-year, 100-year, 500-year, and SPF protection. The average annual benefits are compared with the average annual costs amortized across the 50-year project evaluation period. Average annual costs for the 500-year level of protection amount to $456,700.

As illustrated in Table B9, the highest B/C ratio is for 500-year level of protection. This B/C ratio (1.63) is greater than 1.0 and therefore is an economically feasible plan. It should be noted, as illustrated in Table B9, that the 500-year degree of protection shows greatest net benefits, $286,490. (Total Average Annual Benefits - Total Average Annual Costs = Net Benefits). Since the 500-year plan yields the highest net benefits it is to be considered the most favored plan.

(2) Undiscounted Payback Period

B4.20 An analysis of undiscounted payback period was conducted. Payback is the project year in which undiscounted annual benefits first exceed annual charges. It was found that the alternatives providing 100 and 500-year levels of protection all have payback periods of 7 years; while the alternative providing 50-year level of protection has a payback of 8 years, and the alternarive providing SPF protection has a payback period of 19 years. The results of the payback analysis are summarized in Table B9.

(3) Discounted Payback Period

B4.21 Discounted payback period is the project year in which discounted annual benefits first exceed discounted annual charges. An analysis of discounted payback period was conducted, the results of which are summarized in Table B9. As illustrated, the 500-year level of protection exhibits the lowest payback period and, thus, is to be considered the most favored plan based on the discounted payback measure of economic efficiency.

f. Sensitivity Analysis.

B4.22 According to Principles and Standards, sensitivity analysis is a necessary feature of any good multivariate analysis. The planner cannot be satisfied with the definition of a plan that is optimal for a specific set of conditions if the plan is particularly sensitive to changes in the model.

B4.23 In this analysis, increases in future residential damages have been based on increase in value of residential contents over time.

B4.24 The sensitivity analysis is conducted under the alternate assumption that there is no increase in the average value of residential contents over time. Based on this alternate assumption and as shown in Table B10, the 50-year, 100-year, 500-year levels of protection all are justifiable plans with benefit/cost ratios greater than unity. The 500 year plan has maximum net benefits and, thus, remains the most favored alternative under this alternate assumption.

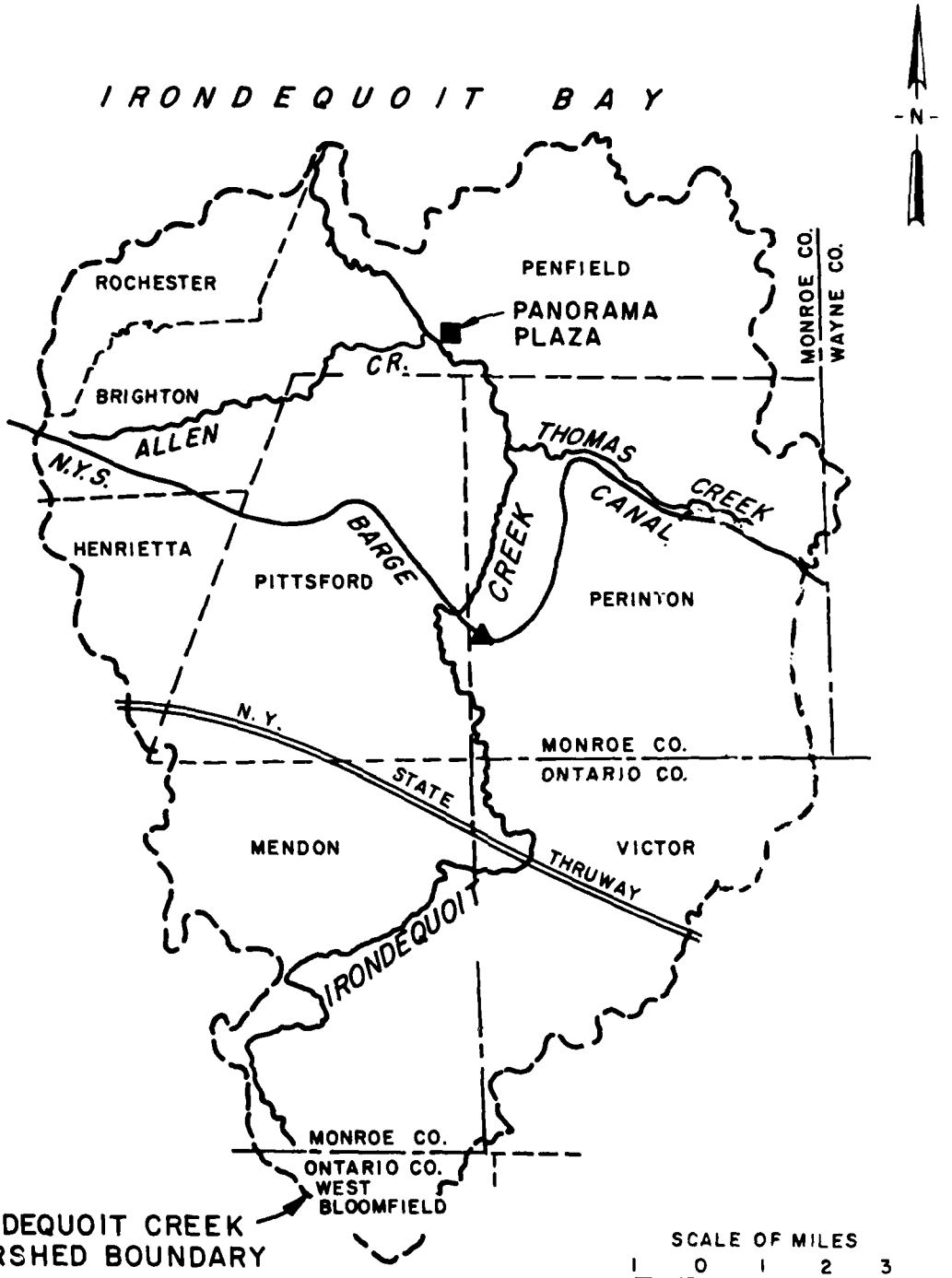
Table B9 - Summary of First Cost and Annual Benefits for Alternative Levels of Protection
(March 1981 Price Levels - 7-3/8 Percent Interest Rate)

Degree of Protection	Total Project First Cost	Interest During Construction	Total Project Investment Cost	Investment Cost Amortized Over 50-Year Project Life	Annual Operation and Maintenance	Total Average Annual Costs	Total Average Annual Benefits	Average Annual Net Benefits	B/C Ratio	Undiscounted Payback Period	Discounted Payback Period
50-Year	4,576,000	0	4,576,000	347,400	79,800	427,200	630,810	203,610	1.477	8 years	11 years
100-Year	4,673,000	0	4,673,000	354,700	81,300	436,000	678,180	242,180	1.555	7 years	10 years
500-Year	4,900,000	0	4,900,000	372,000	84,700	456,700	743,190	286,490	1.627	7 years	9 years
SPF	11,255,000	0	11,255,000	854,400	180,000	1,034,400	764,040	-270,360	.739	19 years	1/

1/ Discounted payback period for the 50-year evaluation period is greater than 50-year evaluation period.

Table B10 - Comparison of Existing Average Annual Benefits and Average Annual Costs (March 1981 Price Levels)

Level of Protection	Existing Average Annual Benefits	Average Annual Costs	Net Benefits	B/C Ratio
50-Year	627,720	427,200	200,520	1.469
100-Year	674,960	436,000	238,960	1.548
500-Year	739,800	456,700	283,100	1.619
SPF	760,600	1,034,400	-273,800	.735



COMPOSITION OF WATERSHED

MONROE CO. : 120 SQ MILES 87%

ONTARIO CO. : 17 SQ. MILES 12%

WAYNE CO. : 2 SQ. MILES 1%

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

ILLUSTRATION OF IRONDEQUOIT CREEK WATERSHED

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE B1

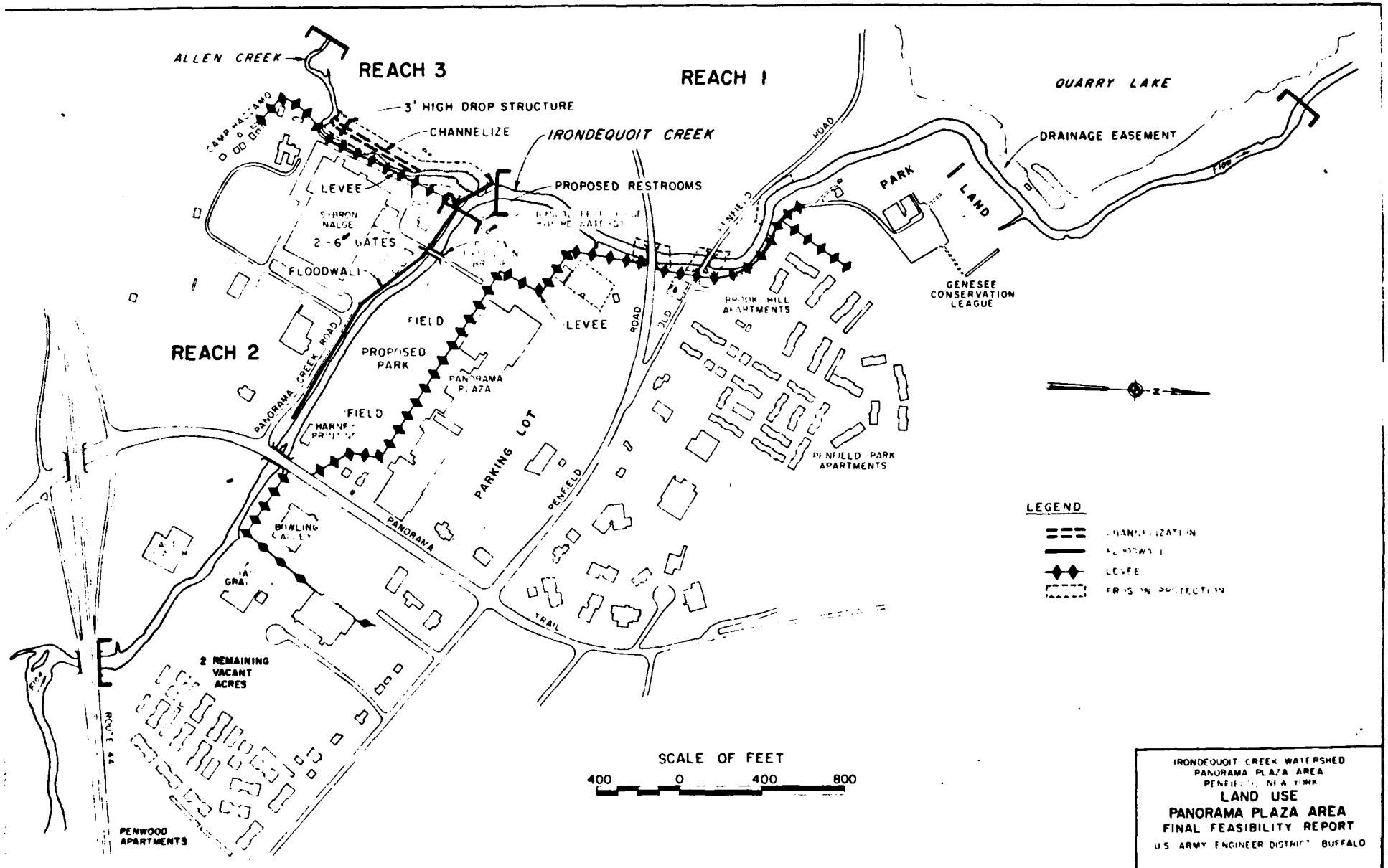
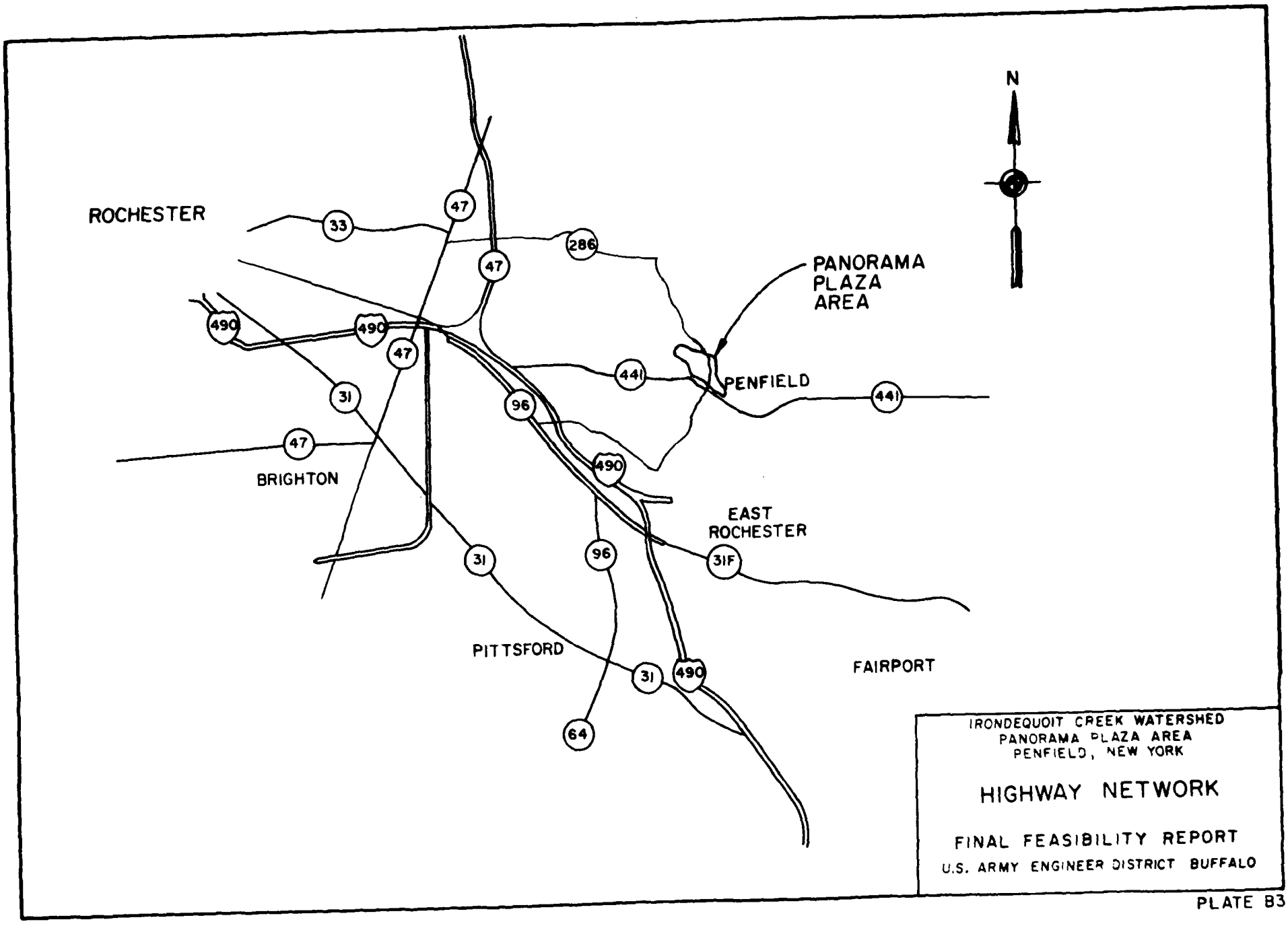

ALLEN CREEK
REACH 3
REACH 1
REACH 2
3' HIGH DROP STRUCTURE
CHANNELIZE
IRONDEQUOIT CREEK
PROPOSED RESTROOMS
LEVEE
2 - 6' GATES
FLOODWALL
FIELD
PROPOSED PARK
PANORAMA PLAZA
PARKING LOT
PANORAMA CREEK ROAD
PENFIELD ROAD
PANORAMA TRAIL
BOWLING ALLEY
2 REMAINING VACANT ACRES
PENWOOD APARTMENTS
ROUTE 441
BROOK HILL APARTMENTS
PENFIELD PARK APARTMENTS
QUARRY LAKE
DRAINAGE EASEMENT
PARK LAND
GENESEE CONSERVATION LEAGUE
LEGEND
LEVEE
SCALE OF FEET
400 0 400 800
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
LAND USE
PANORAMA PLAZA AREA
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B2

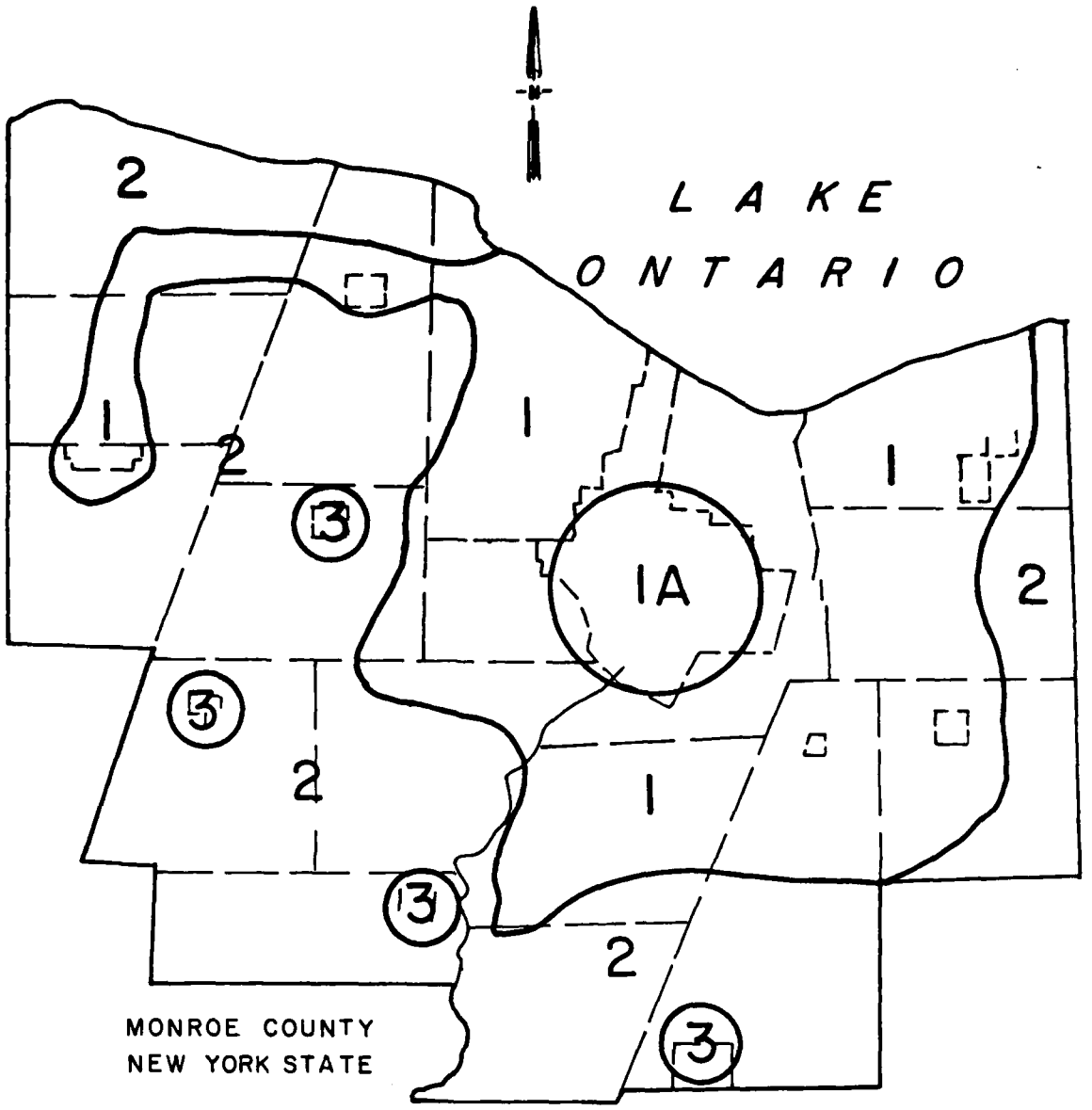


IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

HIGHWAY NETWORK

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B3



LEGEND:

AREA 1 - SERVED BY EXISTING OR APPROVED PURE WATERS AND WEBSTER SEWERS

AREA 1A - CITY OF ROCHESTER

AREA 2 - UNSEWERED AREA

AREA 3 - MUNICIPAL SEWER AREA

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

AREAS SERVICED BY PURE WATERS AND UNSEWERED AREAS

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B4

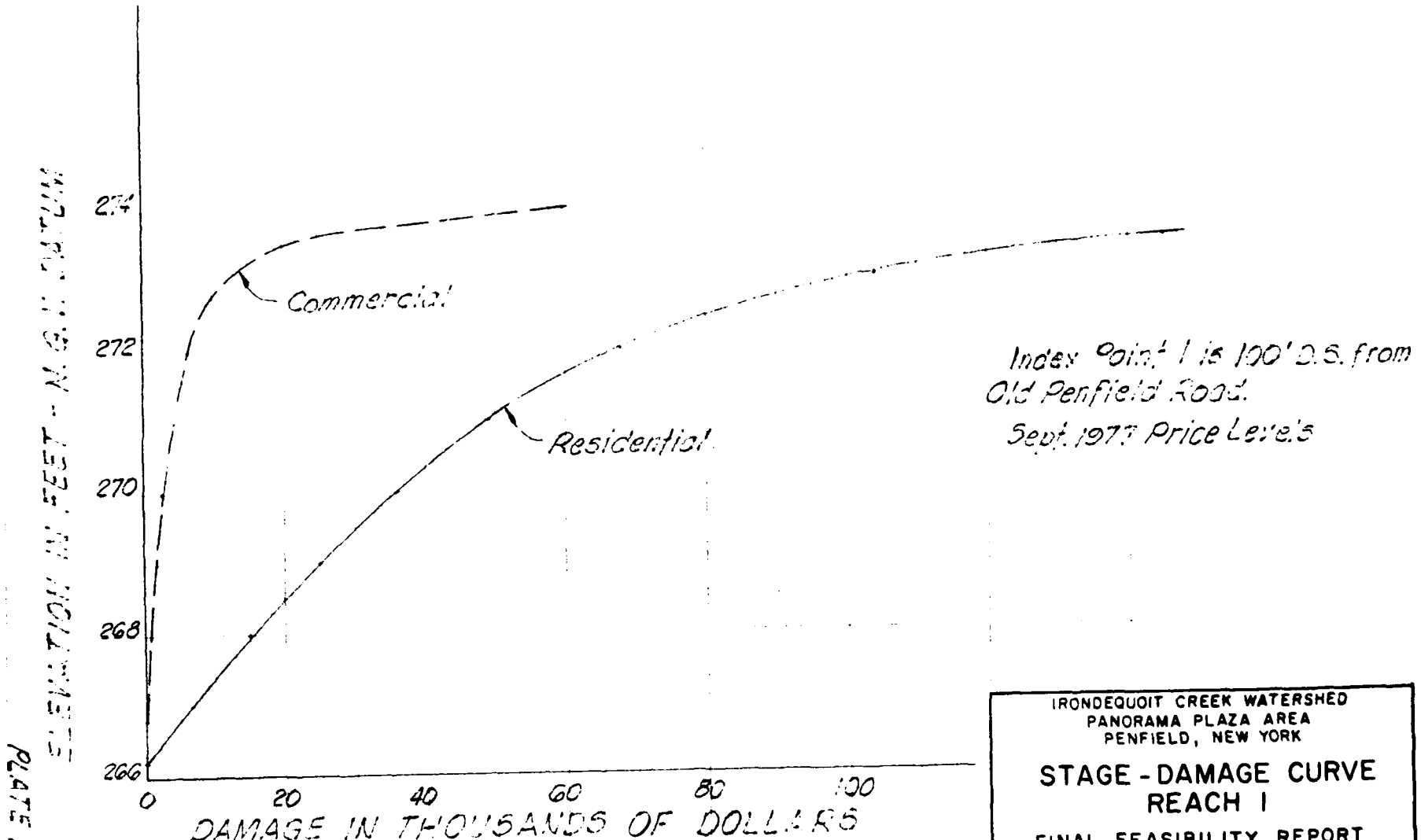


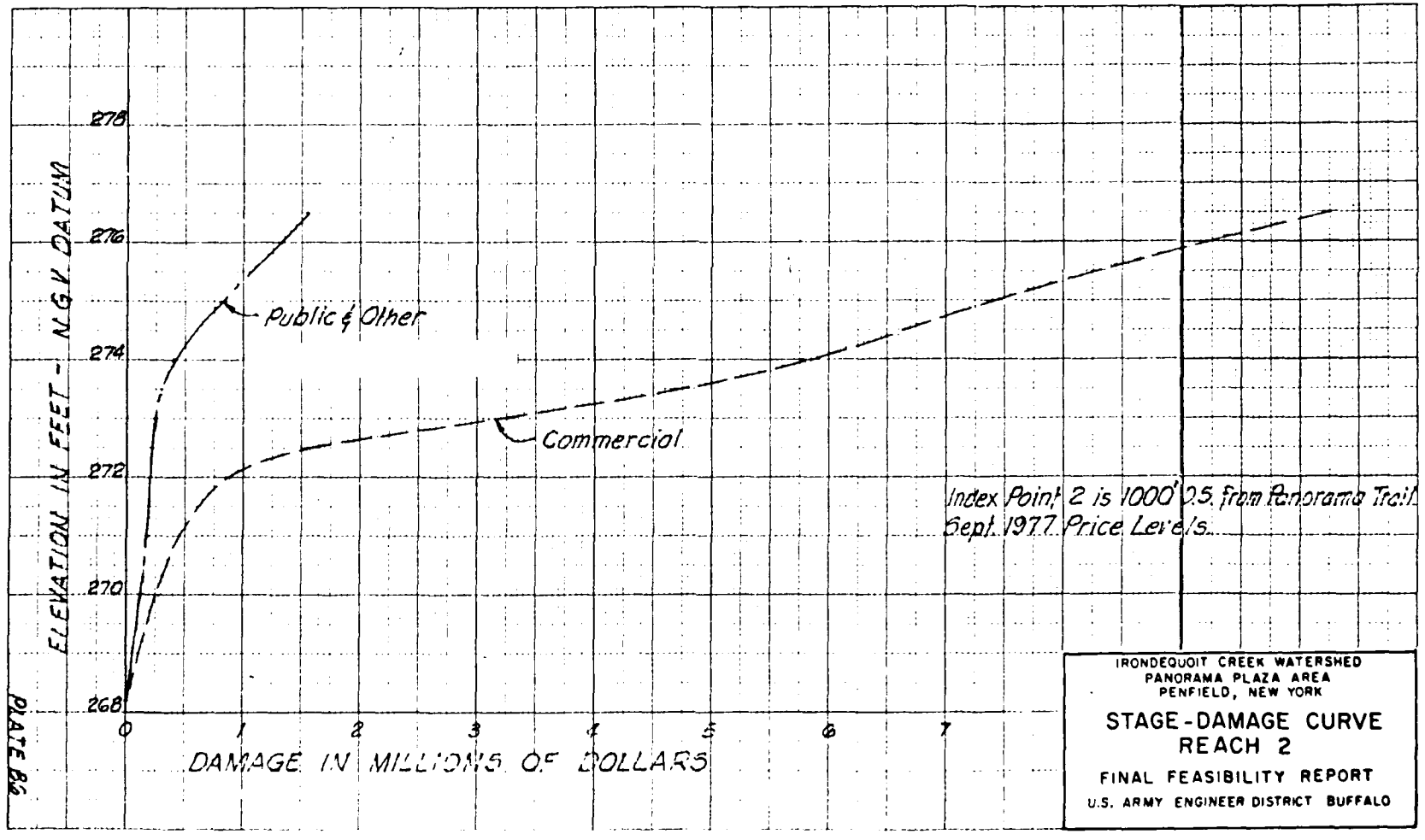
PLATE 35

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

STAGE - DAMAGE CURVE REACH 1

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO


ELEVATION IN FEET - N.G.V. DATUM
278
276
274
272
270
268
0
1
2
3
4
5
6
7
DAMAGE IN MILLIONS OF DOLLARS
Public & Other
Commercial
Index Point 2 is 1000' O.S. from Panorama Trail
Sept. 1977 Price Levels.
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
STAGE-DAMAGE CURVE
REACH 2
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
PLATE B6

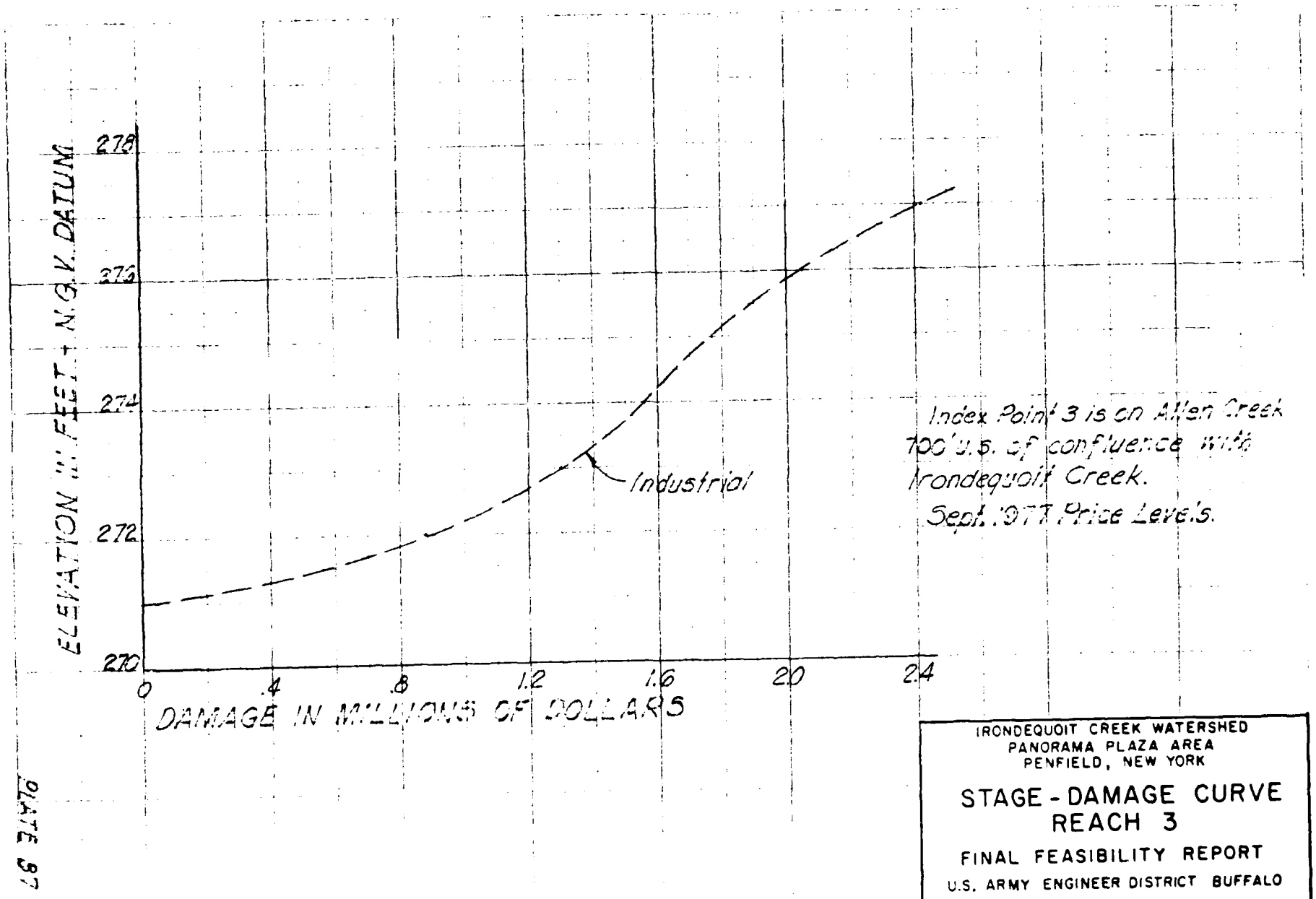


PLATE 87

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

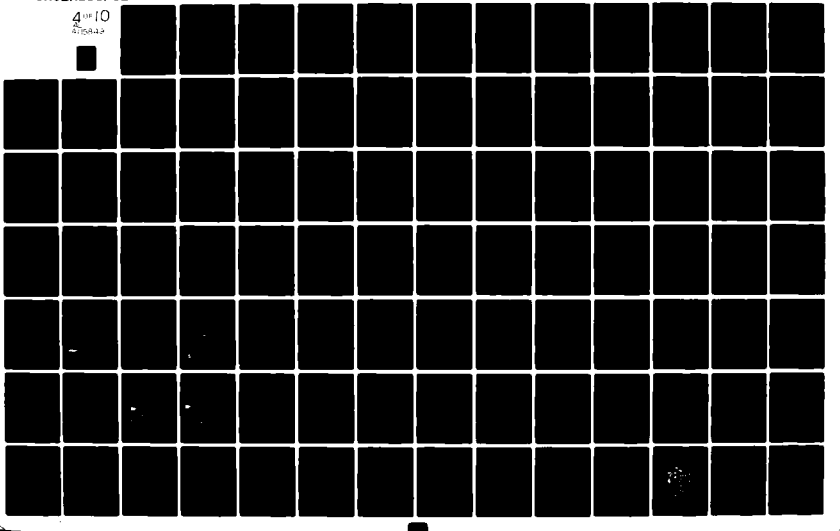
STAGE - DAMAGE CURVE REACH 3

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL



ADDENDUM TO APPENDIX B

SEPTEMBER 1977 FLOOD DAMAGE SURVEY DATA

U. S. ARMY ENGINEER DISTRICT, BUFFALO

INDUSTRIAL AND COMMERCIAL DAMAGE

INTERVIEW NUMBER	BUSINESS NAME	SQUARE FOOTAGE	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
1	Carvel	1,000	270.25	64,000	85,300	103,400	117,500
2	Arnold Palmer	300	267.0	6,200	7,200	8,400	11,300
3	Let's Play Baseball	0	267.50	3,700	6,450	7,600	7,700
4	J. M. Fields	60,000	271		527,900	1,334,000	1,353,000
5	Atties Young Fashions	2,300	271.6		33,200	40,800	44,400
6	Panorama Fashions	2,500	271.7		43,200	55,800	58,900
7	Macey's Fashion Fabrics	2,200	271.6		20,700	26,500	38,400
8	Central Trust Bank	2,300	271.6		28,200	44,300	60,400
9	National Auto	5,000	271.6		39,800	167,900	181,000
10	Sherman-Williams Paints	2,400	272		6,200	18,300	72,400
11	Shed House	2,000	272		11,700	40,500	65,900
12	Salad Bowl Restaurant	3,000	272		4,100	86,400	93,700
13	Fanny Farmer	1,000	272		3,900	9,000	12,100
14	Jenny Shoe Repair	530	272		6,150	20,100	22,000
15	Barber Shop	400	272		15,600	21,800	23,800

INDUSTRIAL AND COMMERCIAL DAMAGE (Cont'd)

INTERVIEW NUMBER	BUSINESS NAME	SQUARE FOOTAGE	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE			
				271.0	273.0	275.0	277.0
16	Panorama Sports	4,800	272		20,200	22,800	48,800
17	Penfield Flower Shop	-	272		6,200	15,800	90,200
18	Laundromat	5,000	272		39,300	41,400	44,500
19	Liquor Store	2,000	272		42,200	67,800	85,400
20	Colony	1,400	272		27,200	81,000	113,900
21	J. D.'s Fork and Glass	1,500	272		23,300	100,800	134,400
22	Woolworth	20,000	272		64,300	405,400	621,500
23	1/2 Price Book Store	5,520	272		5,600	15,500	16,100
24	Peanut Shoppe	1,000	272		16,000	34,000	46,000
25	Radio Shack	1,500	272		9,900	42,000	101,000
26	Present Company	10,000	272		89,300	307,400	660,500
27	Tower	10,000	271.6		70,800	109,900	131,000
28	Key Drugs	7,000	272		53,200	113,300	228,400
29	Community Savings Bank	5,500	272		52,300	113,400	234,500
30	Hess Gas	200	270		16,100	31,200	36,800
31	Carrol's Restaurant	1,000	273			38,400	159,500

INDUSTRIAL AND COMMERCIAL DAMAGE (Cont'd)

INTERVIEW NUMBER	BUSINESS NAME	SQUARE FOOTAGE	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
32	Panorama Theater	10,000	269	116,200	143,300	167,400	181,500
33	Flower City Beauty Salon	1,500	272		4,100	10,200	28,800
34	Phelp's Glass Shop	2,200	271.6		13,200	47,800	80,400
35	Star Market	29,500	272		111,000	300,300	423,000
36	Wink Photo	500	271.81		4,300	6,650	8,900
37-1	Camp Haccamo Lake	5,000	265.0	218,500	223,500	228,500	238,500
37-2	Camp Haccamo Webster Club	500	275				12,600
37-3	Camp Haccamo Cabin #8	500	276				6,500
37-4	Camp Haccamo Wood Frame Shed	500	268.5	2,400	5,750	6,100	6,400
38	Tops Market	35,000	276.85				21,000
39	Panorama Bowling	31,000	272.5		200,500	296,600	375,000
40	Panorama Car Wash	2,000	274.5				26,800
41	M&W Warehouse/Showroom	2,000	275.68				191,500
42	Kitchens by Donahue	14,000	270	6,500	57,400	133,100	153,800
43	CVS Pharmacy	8,000	276.50				6,900
44	Rudnicks Furniture	3,600	270	14,100	31,700	40,300	53,900

INDUSTRIAL AND COMMERCIAL DAMAGE (Cont'd)

INTERVIEW NUMBER	BUSINESS NAME	SQUARE FOOTAGE	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
45	Harney Printing	4,800	271.7		79,300	143,400	224,000
46	Dime Bank	10,000	272		49,500	71,000	109,000
47	Monroe Contractors	5,000	270	11,300	33,600	58,000	111,500
48	A. D. Data Corp.	100,000	270		2,000	3,500	5,500
49	Seneca Metal	6,000	270	10,800	52,500	258,400	557,000
50	Winross, Inc.	12,500	270	1,300	1,002,000	1,002,600	1,003,200
51	Kentucky Fried Chicken	-	272		4,300	140,800	191,500
52	Lilac Laundry	1,000	270	4,000	35,500	37,500	40,000
53	Arco Gas Station	600	273			4,900	12,000
54	Beauty Rama	1,000	273			19,200	42,300
55	H&L Blumenfeld	800	270	7,400	11,600	15,900	40,700
56	Davin-Jorgensen	5,700	271		116,500	237,500	295,800
57	Dutch Boy Paints	2,800	273			90,700	113,300
58	Leary's Cleantown	2,500	269	311,000	320,500	330,500	339,500
59	Big "M" Stolts	21,500	271		209,600	465,800	833,000
60	Citi Bank, Penfield Rd.	1,500	275				7,500

INDUSTRIAL AND COMMERCIAL DAMAGE (Cont'd)

INTERVIEW NUMBER	BUSINESS NAME	SQUARE FOOTAGE	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
61	Raymonds Hair	600	273			6,050	10,300
62	Morts Farms Market	1,500	269	1,600	4,400	9,050	13,400
63	Perkins Swim Club	22,000	270.5	33,500	42,000	60,500	76,500
64	Skin & Scuba Dive Hut	600	268	1,850	5,500	11,200	23,200
65	Genesee Conservation	16,000	270	8,950	122,300	526,900	531,000
66	Monroe Contractors	3,600	273			300,300	564,300
67	Data General Corp.	3,000	274			24,600	66,700
68	The Nash Engr. Co.	800	274			3,100	6,700
69	Robert Kidd Agency	1,300	274			5,600	26,200
70	Pios W. Yorio, M.D.	800	274			7,750	40,500
71	Building #2	100,000	273			8,100	11,200
72	Pediatrics at 675 P. Trail	9,100 41,000	273			231,000	400,000
73	Reynolds & Reynolds	100,000	272		42,500	129,000	259,500
74	Sybro Naige	190,000	271		936,000	1,427,000	2,105,000
75	Benderson	-	269.5	10,000	20,000	40,000	50,000
105	Edie Adams Cut & Curl	2,100	273			15,500	46,000
Total				833,300	5,253,850	10,437,200	14,884,200

ADDENDUM TO APPENDIX B

SEPTEMBER 1977 FLOOD DAMAGE SURVEY DATA

U. S. ARMY ENGINEER DISTRICT, BUFFALO

RESIDENTIAL DAMAGE

INTERVIEW NUMBER	RESIDENTIAL	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
76	#12, 14, 16 Brookhill Apts. (18 units)	272		126,000	167,400	194,400
77	#19, 21, 23 Brookhill Apts. (18 units)	273			142,200	174,600
78	#7, 9, 11 Brookhill Apts (18 units)	272		115,200	150,300	243,000
79	#18, 20, 22 Brookhill Apts. (18 units)	272		122,400	159,300	252,000
80	#3, 5 Brookhill Apts. (18 units)	271		138,500	181,800	252,000
81	#13, 15, 17 Brookhill Apts. (18 units)	272		117,000	157,700	207,000
82	#3-23 Penfield Apts. (6 units)	270	36,300	45,300	74,400	74,400
83	#4-40 Penfield Apts. (10 units)	270	40,500	75,500	124,000	124,000
84	#37-69 Penfield Apts. (9 units)	270	18,000	59,400	105,300	107,100

RESIDENTIAL DAMAGE (Cont'd)

INTERVIEW NUMBER	RESIDENTIAL	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
85	#44-72 Penfield Apts. (8 units)	272		32,400	68,000	97,600
86	#73-101 Penfield Apts. (8 units)	270	30,800	59,600	110,400	112,000
87	#105 Penfield Apts. (1 unit)	272		2,850	8,750	14,000
88	#109 Penfield Apts. (1 unit)	273			6,050	14,000
89	#113 Penfield Apts. (1 unit)	275				8,000
90	#117 Penfield Apts. (1 unit)	275				7,050
91	#218, 222 Penfield Apts. (2 units)	271		9,100	18,600	26,000
92	#211, 215 Penfield Apts. (2 units)	273			4,400	15,100
93	#226, 262 Penfield Apts. (10 units)	271		42,500	87,500	107,000
94	#226, 286 Penfield Apts. (6 units)	271		25,500	52,500	64,200
95	Garage Units Penfield (3 units)		600	1,200	1,800	2,400

RESIDENTIAL DAMAGE (Cont'd)

INTERVIEW NUMBER	RESIDENTIAL	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
96	1610 Penfield Road (1 unit)	269	8,500	9,100	11,100	12,200
97	1659 Penfield Road (Ha. & Gar. vacant)	273.50			200	200
98	Brookhill Pool	270	2,000	3,400	6,200	13,500
99	#60, 62 Pennwood Apts.	276.6	ZERO DAMAGE AT 4' OF WATER			
Total			136,700	984,950	1,637,900	2,121,750

ADDENDUM TO APPENDIX B

SEPTEMBER 1977 FLOOD DAMAGE SURVEY DATA

U. S. ARMY ENGINEER DISTRICT, BUFFALO

PUBLIC UTILITIES DAMAGE

INTERVIEW NUMBER	BUSINESS NAME	SQUARE FOOTAGE	ZERO DAMAGE EVALUATION	AMOUNT OF DAMAGE 271.0	273.0	275.0	277.0
100	U. S. Post Office	1,500	272.2	-	12,500	48,300	73,800
101	Co. of Monroe License Bureau	3,000	273	-	-	14,300	19,300
102	Old Sewage Treatment Plant	-	270	12,500	14,500	17,500	19,500
103	Rochester Gas & Electric	-	270	33,680	36,780	374,460	374,460
104	Rochester Gas & Electric	-	267	33,680	36,780	374,460	374,460
Total				79,860	100,560	830,020	861,520

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX C
HYDROLOGIC ENGINEERING AND HYDRAULIC DESIGN

U. S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX C
HYDROLOGIC ENGINEERING AND HYDRAULIC DESIGN

TABLE OF CONTENTS

SECTION 1 - HYDROLOGIC ENGINEERING

Paragraph	Subject	Page
C1.1	BASIN DESCRIPTION	C-1
C1.1.1	General	C-1
C1.1.2	Climatology	C-2
C1.2	HISTORICAL FLOODS	C-3
C1.2.1	General	C-3
C1.2.2	Notable Storms	C-3
C1.2.3	Irondequoit Creek Watershed	C-4
C1.2.4	Irondequoit Creek	C-4
C1.2.5	Thomas Creek	C-8
C1.2.6	Allen Creek	C-8
C1.2.7	Other Unnamed Tributaries	C-8
C1.3	MAJOR FLOODPRONE AREAS	C-8
C1.3.1	General	C-8
C1.3.2	Ellison Park	C-9
C1.3.3	Panorama Plaza	C-9
C1.3.4	Bushnell Basin	C-9
C1.3.5	Future Floods	C-10
C1.4	GAGING STATIONS	C-10
C1.4.1	Stream Gages	C-10
C1.4.2	Precipitation Gages	C-17
C1.5	RAINFALL-RUNOFF ANALYSIS	C-17
C1.5.1	General	C-17
C1.5.2	Allen Creek	C-18
C1.5.3	Irondequoit Creek	C-18
C1.6	FLOOD PROBABILITY	C-20
C1.6.1	Regional Studies	C-20
C1.6.2	Discharge-Frequency Curves at Gages	C-20
C1.6.3	Discharge-Frequency Curves in Project Area	C-23
C1.6.4	Recommended Discharge-Frequency Curves	C-25
C1.7	STANDARD PROJECT FLOOD	C-25
C1.8	DIFFERENCES FROM PREVIOUS PUBLISHED REPORTS	C-26

TABLE OF CONTENTS (CONT'D)

SECTION 1 - HYDROLOGIC ENGINEERING (CONT'D)

Paragraph	Subject	Page
C1.9	URBANIZATION	C-28
C1.10	DAMAGE REACHES AND INDEX POINTS	C-28
C1.11	RATING CURVES FOR EXISTING CONDITIONS	C-28
C1.12	RATING CURVES FOR IMPROVED CONDITIONS	C-29
C1.13	STAGE-FREQUENCY CURVES, EXISTING CONDITIONS	C-30
C1.14	STAGE-FREQUENCY CURVES, IMPROVED CONDITIONS	C-30
C1.15	FUTURE STUDIES REQUIRED DUE TO SENSITIVITY ANALYSIS	C-30
	SECTION 2 - HYDRAULIC DESIGN	
C2.1	GENERAL	C-32
C2.2	DESIGN DISCHARGES	C-32
C2.3	CHANNEL DESIGN	C-32
C2.4	BANK PROTECTION	C-32
C2.5	SELECTED PLAN	C-33
	SECTION 3 - INTERIOR FLOOD CONTROL	
C3.1	GENERAL	C-34
C3.2	DRAINAGE AREA	C-34
C3.2.1	General	C-34
C3.2.2	Area 1	C-34
C3.2.3	Area 2	C-34
C3.2.4	Area 3	C-34
C3.2.5	Area 4	C-34

TABLE OF CONTENTS (CONT'D)

SECTION 3 - INTERIOR FLOOD CONTROL (CONT'D)

Paragraph	Subject	Page
C3.3.1	Unit Hydrograph and Loss Rate Parameters	C-34
C3.3.2	Interior Flood Hydrographs	C-35
C3.4	STAGE-DAMAGE CURVES	C-36
C3.5	INTERIOR FLOOD CONTROL ALTERNATIVES	C-36
C3.5.1	General	C-36
C3.5.2	Area 1	C-37
C3.5.3	Area 2	C-37
C3.5.4	Area 3	C-37
C3.5.5	Area 4	C-37
C3.6	PONDING AREAS	C-38
C3.7	STAGE-FREQUENCY CURVES	C-38
C3.7.1	Existing Conditions	C-38
C3.7.2	Improved Conditions	C-38
C3.7.3	Benefits and Costs	C-38

TABLES

Number	Title	Page
C1	Drainage Area	C-2
C2	Damage Areas in Irondequoit Creek Basin	C-5
C3	Irondequoit Creek Basin Gaging Station Information	C-12
C4	Annual Peak Discharge	C-12
C5	Partial Duration Discharges - Allen Creek	C-14
C6	Partial Duration Discharges - Irondequoit Creek at Gage	C-16

TABLE OF CONTENTS (CONT'D)

TABLES (CONT'D)

Number		Page
C7	USGS Gaging Stations Around the Irondequoit Creek Watershed	C-21
C8	March 1955, March 1956, and June 1972 Storms	C-23
C9	Comparison of 100-Year Peak Discharges	C-27
C10	Comparison of SPF Peak Discharges	C-27
C11	Irondequoit Creek Flow Distribution - Existing Conditions	C-29
C12	Allen Creek Discharge-Frequency	C-30

FIGURES

Number	Title	Page
C1	May 1974 Flood Hydrograph - Allen Creek	C-40
C2	Unit Hydrograph - Allen Creek	C-41
C3	May 1974 Flood Hydrograph - Irondequoit Creek	C-42
C4	Unit Hydrograph - Irondequoit Creek	C-43
C5	Mean Annual Discharge	C-44
C6	Mean Annual Discharge	C-45
C7	Standard Deviation	C-46
C8	Duration Skew	C-47
C9	Discharge-Frequency Curves - Irondequoit Creek at Gage	C-48
C10	Discharge-Frequency Curves - Allen Creek at Gage	C-49
C11	Peak Discharge vs. Drainage Areas	C-50
C12	Discharge-Frequency Curves - Irondequoit Creek Just Downstream of Allen Creek	C-51

TABLE OF CONTENTS (CONT'D)

FIGURES (CONT'D)

Number	Title	Page
C13	Discharge-Frequency Curve - Allen Creek at Confluence With Irondequoit Creek	C-52
C14	Discharge-Frequency Curve - Irondequoit Creek Just Upstream of Confluence With Allen Creek	C-53
C15	Discharge-Frequency Curve - Irondequoit Creek Just Downstream of Confluence With Allen Creek	C-54
C16	Standard Project Flood - Irondequoit Creek	C-55
C17	Standard Project Flood - Allen Creek	C-56
C18	Water Surface Profiles - Irondequoit Creek	C-57
C19	Water Surface Profiles - Allen Creek	C-58
C20	Stage-Discharge Curves - Reach 1	C-59
C21	Stage-Discharge Curves - Reach 2	C-60
C22	Stage-Discharge Curves - Reach 3	C-61
C23	Stage-Frequency Curves - Reach 1	C-62
C24	Stage-Frequency Curves - Reach 2	C-63
C25	Stage-Frequency Curves - Reach 3	C-64
C26	Stage-Damage Curve - Area 1	C-65
C27	Stage-Damage Curve - Area 2	C-66
C28	Stage-Damage Curve - Area 3	C-67
C29	Stage-Damage Curve - Area 4	C-68
C30	Area-Capacity Curve - Area 1	C-69
C31	Area-Capacity Curve - Area 2	C-70
C32	Area-Capacity Curve - Area 3	C-71
C33	Area-Capacity Curve - Area 4	C-72
C34	Stage-Frequency Curves - Area 1	C-73

TABLE OF CONTENTS (CONT'D)

FIGURES (CONT'D)

Number	Title	Page
C35	Stage-Frequency Curves - Area 2	C-74
C36	Stage-Frequency Curves - Area 3	C-75
C37	Stage-Frequency Curves - Area 4	C-76

PLATES

Number	Title	
C1	Basin Map	C-77
C2	Damage Areas	C-78
C3	Regional Gaging Stations	C-79
C4	Interior Flood Control	C-80
C5	Ponding Areas	C-81

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX C
HYDROLOGIC ENGINEERING AND HYDRAULIC DESIGN

SECTION 1 - HYDROLOGIC ENGINEERING

C1.1 BASIN DESCRIPTION

C1.1.1 General.

The Irondequoit Creek Watershed is roughly triangular in shape and located east and southeast of the city of Rochester, NY. It drains an area of 139 square miles in Monroe, Ontario, and Wayne Counties. Approximately 8.5 square miles drains directly into the New York State Barge Canal, which runs east and west through the basin. The New York State Thruway also runs east-west through the basin.

Irondequoit Creek runs generally north for a total distance of 32 miles. The watershed is approximately 16.5 miles in length and 12 miles in width. Irondequoit Creek rises in Ontario County at an elevation of 780 feet (NGVD) and discharges into Irondequoit Bay at the elevation of Lake Ontario, whose long-term mean is 244.7 feet (IGLD). Irondequoit Creek's gradient is 20 feet/mile upstream of the Barge Canal and 11 feet/mile downstream of the Barge Canal. Plate C1 depicts the Irondequoit Creek Watershed. Table C1 lists drainage areas for the various tributaries and main stem of Irondequoit Creek.

Allen and Thomas Creeks are the major tributaries, of approximately 40, which drain into Irondequoit Creek. Allen Creek originates in central Monroe County at an elevation of 525 feet (NGVD), flows north and crosses under the Barge Canal, then changes direction to travel east until it meets Irondequoit Creek at stream mile 5.53 (distance along Irondequoit Creek upstream from its mouth at Irondequoit Bay) and elevation 258 feet (NGVD). The Allen Creek Watershed measures 31 square miles and has a stream gradient of 29 feet/mile. Thomas Creek rises at elevation 500 feet (NGVD) in eastern Monroe County. Thomas Creek flows south until it reaches the vicinity of the Barge Canal where it turns west paralleling the Barge Canal to meet Irondequoit Creek at stream mile 9.79 and elevation 366 feet. The Thomas Creek Watershed has a drainage area of 28 square miles. Thomas Creek has a stream gradient of 7.4 feet/mile for the southerly flowing portion of this creek, and a stream gradient of 14.5 feet/mile for the portion that parallels the Barge Canal.

Table C1 - Drainage Area

Station	Area (sq. mi.)
Upstream Barge Canal on Irondequoit Creek	51.3
Thomas Creek	27.8
Local Area Between Thomas Creek and Barge Canal	8.5
Downstream Thomas Creek on Irondequoit Creek	87.6[1/]
Irondequoit Creek at Gage	92.8[1/]
Irondequoit Creek Upstream Allen Creek	97.4[1/]
Allen Creek at Gage	30.1[2/]
Allen Creek at Mouth	31.1[2/]
Irondequoit Creek Downstream Allen Creek	128.5[3/]
Irondequoit Creek at Mouth	139[3/]

1/ Flow from 5.0 sq. mi. not contributing.
2/ Flow from 3.5 sq. mi. not contributing.
3/ Flow from 8.5 sq. mi. not contributing.

C1.1.2 Climatology.

There is a first-order weather station located at the Rochester-Monroe County Airport, an hourly precipitation gage at East Bloomfield, and two daily precipitation gages: one at Honeoye Falls, and one at Macedon, all are in New York State. The gage at Honeoye Falls was abandoned in July 1974, and the gage at Macedon was abandoned in December 1978. The approximate locations of these precipitation gages are shown on Plate C1.

Records for the Rochester gage have been kept since 1872 for temperature, 1829 for precipitation, and 1941 for snowfall. The extremes for this period are: temperature - a high of 100°F and a low of -19°F; precipitation - a maximum monthly of 9.70 inches and a minimum monthly of 0.22 inches. The maximum monthly snowfall was 64.8 inches. For the period of record of 1940 through 1979, normal annual and monthly values of precipitation, snowfall, and temperature were obtained for the Rochester gage. The 40-year normal annual precipitation is 32.63 inches. The monthly averages range from a low of 2.39 inches in February to a high of 3.08 inches in June. The 40-year normal annual snowfall is 89.1 inches. The maximum monthly average snowfall

is 22.9 inches, occurring in January. The 40-year normal annual temperature is 47.8 degrees, with July being the warmest month (71.3°F) and February the coldest month (24.4°F).

C1.2 HISTORICAL FLOODS

C1.2.1 General.

Floods can be a result of excessive overland runoff to the main stream of Irondequoit Creek or its tributaries. Three causes of excessive runoff are: (1) large amounts of rainfall over an extended time; (2) combinations of moderate rainfall and snowmelt in spring; and (3) localized thunderstorms. The physical characteristics of the watershed vary considerably making it prone to various flooding problems. Other factors contributing to floods include natural obstructions, such as vegetation along banks and channels; and man-made obstructions, such as bridges or unmaintained or undersized culverts.

C1.2.2 Notable Storms.

There is little definitive historical record of flood events for the Irondequoit Creek Watershed. This is due to the lack of gaging records prior to 1959, and a low rural population density within the flood plains of the watershed prior to the 1950's. Subsequent paragraphs provide a brief description of known past floods.

May 1864 - This is estimated to be the largest known flood to date. A heavy rain and subsequent overbank flows caused considerable damage to flour and saw mills adjacent to the creek in the Penfield area.

September 1912 - A flood resulted from a break in the Barge Canal at the crossing over Irondequoit Creek. The escaping canal water washed out about 500 feet of embankment and the Barge Canal was inoperable for over a month.

Spring 1934 - This flood was caused by a sudden thaw after a cold spell. Chunks of ice took out the Daisy Flour Mill Dam in Penfield near Ellison Park, forcing its owners to change to diesel power.

31 March 1960 - This is the major recent flood for which a somewhat definitive though sketchy historical record exists. It has been determined that in nearby drainage basins, such as Black Creek and Oatka Creek, which are tributaries of the Genesee River in western Monroe County, and the lower Genesee River basin, the March 1960 flood was approximately a 20- to 25-year event. Considerable damage was caused in the Panorama Plaza area of Penfield. In April 1968, a preliminary flood damage survey was made for the Irondequoit Creek Basin based on the 1960 flood. Flood damages for the basin were estimated at $350,000 based on 1968 price levels. High water marks and flood outlines were also estimated and recorded.

May 1974 - Irondequoit Creek flooded as a result of thunderstorms which dropped from 3 to 4 inches of rain. The Panorama Plaza area of Penfield was hardest hit. The basements of a recently constructed apartment development

were flooded to a depth of 6 to 7 feet. Property damage was very high with numerous buildings and cars flooded. This was a localized storm with the greatest rainfall occurring over the watershed of Allen Creek, tributary to Irondequoit Creek in northeast Monroe County.

October 1974 - A collapse in the bottom of the Barge Canal at the Interstate 490 overpass in the Bushnell Basin area caused severe local flooding with great property damage. A number of homes immediately downstream from the breach in the canal were completely destroyed by the sudden surge of water into the low-lying area. The flood profile at the nearby Interstate 490 and Pittsford-Palmyra Road bridges over on Irondequoit Creek approximated computed for a 100-year frequency flood event. Because the flood wave was attenuated significantly due to valley storage, there was no flooding in the Panorama area.

March 1976 - On 3 and 4 March 1976, about 0.7 inches of rain combined with 3 inches of snow on the ground produced flooding along Irondequoit Creek. On 3 March 1976, the weather conditions were mixed with heavy fog, thunderstorms, ice pellets, glaze and rain, with above freezing temperatures. On 4 March 1976, above freezing temperature and heavy fog was prevalent. In the Panorama Plaza area, the flooding was confined to parking lots and streets. No physical damage was reported.

C1.2.3 Irondequoit Creek Watershed.

The Irondequoit Creek watershed is subject to annual flooding of varying degrees in many scattered areas. Plate C2 shows 20 scattered floodprone areas of probable concern in the watershed. Table C2 lists the damage areas and provides a brief description of the area. The 20 major areas of potential flood damage in the Irondequoit Creek watershed were surveyed in 1968 by Buffalo District personnel. The potential floodprone areas were further investigated during interviews with area officials and residents over the years since 1968.

C1.2.4 Irondequoit Creek.

A large proportion of the 20 floodprone areas in the Irondequoit Creek watershed are along the main branch of Irondequoit Creek. They are areas 1, 2, 12, 13, 15, 16, 17, 18, 19, and part of area 9. Of these, area 1 is a county park known as Ellison Park, and area 2 is highly urbanized and includes a large, highly damageable plaza called Panorama Plaza. The other floodprone areas along the main branch are mainly residential or rural with varying potential flood damage conditions and population densities. All areas, however, have experienced flooding to some degree. Plates detailing flooded area maps and water surface profiles for Irondequoit Creek were developed in a Corps Flood Plain Information Report dated February 1975. All areas are briefly described below with more extensive detail of the major areas beginning with Section C1.3.

Table C2 - Damage Areas in Irondequoit Creek Basin

Area No.	Description
1	Ellison Park - Towns of Brighton and Penfield Irondequoit Creek meanders through the park and inundates large areas of the park yearly in the spring. Physical damages are minimal the only structures are a few small park structures and three or four homes which could be evacuated or floodproofed.
2	Panorama Plaza - Town of Penfield The 1960 flood caused considerable overland flooding in the plaza area with intermediate damage. Because of increased development since this, future floods greater than the 1960 flood could cause excessive damage to the plaza and adjacent Brook Hill apartments.
3	Residential Area - Town of Brighton The reports of flooding in this area, along a tributary to Allen Creek, have become more prevalent in recent years due to increased development. Physical damages are minimal and do not justify a Federal project. The few homes in the area could be floodproofed.
4	Golf Course - Town of Pittsford Allen Creek tributary with low banks runs through the golf course, periodically causing considerable overland flooding which results in landscape damage. The homes on the west end of Country Club Drive experience periodic basement flooding which could be prevented by floodproofing.
5	Residential Area - Town of Brighton The Stonybrook Road area had considerable damage in 1960, including damage to driveway bridges caused by overbank flooding of Allen Creek. Floodproofing could reduce damages in the area. Major structural protection measures are not recommended.
6	Residential Area - Town of Pittsford This area is on a tributary to Allen Creek. The area has been flooded many times, however, the damage costs have been minimal for homeowners. The inadequately sized Penn Central R.R. culvert is a restriction to large flows.

Table C2 - Damage Areas in Irondequoit Creek Basin (Cont'd)

Area No.	Description
7	Undeveloped Area - Town of Perinton
	The land adjacent to Thomas Creek is low and is floodprone. However, the lack of development nullifies any need for any immediate flood protection measures.
8	Railroad and Undeveloped Area - Town of Perinton
	This area encompasses a railroad complex and a low swampy area between the railroad and the Erie Canal. The area along Thomas Creek is largely undeveloped and there is no significant flood damage. Clearing and snagging is recommended in the area.
9	Residential Area - Town of Perinton
	A school, a small manufacturing firm, and a few homes along Midvale Drive are susceptible to flooding at the confluence of Thomas Creek into Irondequoit Creek. No major flooding has occurred in recent years. Minor channelization and floodproofing of the structures could improve conditions.
10	Residential Area - Towns of Pittsford and Perinton
	Minor flooding occurs, caused primarily by inadequate culverts. The tributary to Irondequoit Creek is so small that Federal investigation would be unwarranted due to the lack of economic justification.
11	Residential Area - Town of Henrietta
	Minor flooding problems due to Allen Creek have occurred in the area, mainly because of inadequate drainage ditches, and also domestic sewer backups. The town of Henrietta corrected most of the drainage ditch problems.
12	Residential Area - Town of Perinton
	Most of the development in this area is on high ground with little incidence of flooding. There is some unrepaired bank damage along the creek from a previous flood caused when the Barge Canal failed.
13	Residential Area - Town of Pittsford
	Some minor flooding has occurred in the area but the main problem is bank erosion caused from backups at the Barge Canal culvert.

Table C2 - Damage Areas in Irondequoit Creek Basin (Cont'd)

Area No.	Description
14	Residential Area - Town of Perinton There is minimal development in an area tributary to White Brook. There has not been any damage reported in recent years.
15	Powder Mill Park - Town of Perinton Flooding of Irondequoit Creek occurs occasionally in this area, but does not result in any damage other than cleanup expenses. This is an area of wise flood plain usage.
16	Farmland - Towns of Mendon and Victor Flooding occurs almost every spring. However, the area, along Irondequoit Creek, is very rural in nature and has minimal flood damage.
17	Residential Area - Town of Mendon This area has frequently been damaged by minor floods. The causes of the flooding are an inadequate channel, ice jams, and debris. Relief could be obtained through clearing, snagging, and channelization.
18	Farmland and Undeveloped Area - Town of Mendon There are only a few structures near the flood plain of Irondequoit Creek and flood damage is minimal. A Federal project would be difficult to justify.
19	Residential Area - Town of Victor There are possibly only two structures that would possibly be affected by flooding, and damage would be minimal along a tributary to Irondequoit Creek.
20	Residential Area - Town of Penfield A ditch tributary to Thomas Creek creates some flooding problems, but these are not serious enough to warrant further investigation.

C1.2.5 Thomas Creek.

The major areas of potential flood damage along Thomas Creek, as investigated during the District's April 1968 damage survey are areas 7, 8, 9, and 20, shown on Plate C2. There has been little or no previous flood damage reported in these four areas. However, because of recent residential development in areas 9 and 20, a number of homes are now potentially susceptible to flood damage. There is little additional definitive information concerning these potential flood damage areas, due to the small size and isolated nature of the damage areas.

C1.2.6 Allen Creek.

The major areas of potential flood damage along Allen Creek, as surveyed in April 1968, are a portion of area 2, and areas 3, 4, 5, 6, and 11, as shown on Plate C2. All of the areas, except area 4, are residential, with high population densities.

C1.2.7 Other Unnamed Tributaries.

Areas 10 and 14 are also areas of potential flood damage that exist along other minor tributaries to the Irondequoit Creek. Both areas experienced minor or no damage during the March 1960 flood. However, these areas have experienced development in recent years, and the potential for some flood damage now exists.

C1.3 MAJOR FLOODPRONE AREAS

C1.3.1 General.

The 20 damage areas have been investigated numerous times since they were first surveyed in 1968 and later described in the Irondequoit Creek Plan of Study, dated September 1976. Flood problems in Ellison Park (area 1), Panorama Plaza (area 2), and Bushnell Basin (area 13), have been well documented in the past. As noted previously, Ellison Park, a part of the Monroe County Park system, receives little economic damage, the major flood effects being restricted use during flood conditions. Panorama Plaza has had severe flood damage events in 1964 and 1974, with occasional incidences of minor property damage over the years due to flooding. Bushnell Basin has experienced severe erosion and minor flooding problems in the vicinity of the Barge Canal culverts. The 17 remaining floodprone areas have either had their problems corrected or have been identified by municipal officials as sustaining no economic damages outside of isolated, occasional problems such as flooded basements. These 17 floodprone areas have only minor damages and do not have sufficient flood control or erosion protection benefits to warrant a structural Federal project. A nonstructural basin-wide plan is presented in the Main Report. The following areas were considered to warrant further Federal investigation.

C1.3.2 Ellison Park.

Ellison Park (area 1 on Plate C2) is located in the towns of Penfield and Brighton, and is maintained by the Monroe County Park System. The park currently contains four homes and one business, with no record of serious flooding. The parkland serves as a flood plain with very little property damage, even though there is bank overtopping every spring. Since the park serves as a nonstructural solution to the flood problem, it is recommended that no further investigation be made by the Corps of Engineers.

C1.3.3 Panorama Plaza.

Panorama Plaza (area 2 on Plate C2), shown on Plate C3 is located in the town of Penfield. This area lies in the lower region of the Irondequoit Creek basin at the confluence of Allen Creek and is vulnerable to periodic flooding. Most of the damage by the most recent floods since 1960 has been centered in the Panorama Plaza area.

Development in the Panorama Plaza area includes numerous supermarkets, a movie theater, fast food restaurants, automobile service stations, and other commercial establishments. The Brook Hill and Penfield Park apartment buildings are just downstream of the plaza, with several homes and small office buildings nearby. The left bank property holds an automobile dealership, the Sybron/Nalge Corporation, and several light manufacturing structures. The Flood Damage Survey of 1977, which was prepared by the Buffalo District, shows that a total of 76 commercial businesses, 24 residential structures, and five public utilities would be affected by a 4.0 percent chance flood.

Directly behind Panorama Plaza is an access bridge over Irondequoit Creek, which provides a connecting link between the plaza and the industrial area on the left bank. The access bridge culverts are inadequate for channel capacity flow as determined during hydraulic investigations. The bridges on Old Penfield Road and Plaza Extension Road appear to hinder high discharges. Both bridges were analyzed for possible removal.

C1.3.4 Bushnell Basin.

Bushnell Basin (area 13 on Plate C2) is located in the town of Pittsford. Irondequoit Creek passes under the Barge Canal through two 9' X 12' box culverts. There is a significant reduction of flow through the culvert creating a dam effect and causing water to pond against the high embankment of the Barge Canal on the upstream side of the crossing. The additional head thus created further increases the already high velocities in the culvert.

Extensive erosion occurs just downstream of the culvert due to the high velocities from the culverts both at low and high flood stages. A flooding problem is caused by debris jams near the creek bend above the culvert and at the culvert.

Conversations with local residents revealed that flows in the creek cause bank full stages yearly. Localized flooding occurs, but creates little physical damage to the homes in the area. The eroded streambank could be protected by installation of a riprap or gabion revetment and the water velocity could be controlled by construction of a stilling basin downstream of the culverts under the canal. A debris retention structure, properly maintained upstream of the culverts, would also be worthwhile.

The Corps of Engineers has no authority to provide funding for protection of erosion areas on private property. The Corps can only provide planning assistance and technical information to aid in the development and implementation of flood and erosion control measures. Therefore, structural alternatives for the Bushnell Basin area were not considered for further study in this report.

C1.3.5 Future Floods.

Floods of the same or larger magnitude as those that have previously occurred could also occur in the future. Larger floods have been experienced in the past on streams with characteristics similar to those found in the study area. Combinations of rainfall and runoff to those causing these floods could also occur in the study area. Discussion of the future floods in this FFR have been designated as the Intermediate Regional Flood (IRF) and the Standard Project Flood (SPF). The Intermediate Regional Flood is by definition a flood which is likely to be exceeded on the average of once every 100 years or has a 1.0 percent chance of exceedence in any year. It is important to note that while on a long-term basis the frequency of exceedence or the occurrence averages out to once per 100 years. Floods of this magnitude can be exceeded in any given year or even in consecutive years and within any given time interval. The magnitude of the Standard Project Flood is based upon an appraisal of the flows expected to develop due to coincidence of the most critical climatic conditions that are considered reasonably characteristic of the study area. The Standard Project Flood will occur less frequently, but will be more severe than the Intermediate Regional Flood.

C1.4 GAGING STATIONS

C1.4.1 Stream Gages.

There are presently two continuous recording stream gaging stations in the Irondequoit Creek watershed. Two other stage gages, both on Irondequoit Creek, were discontinued in 1972. These stage gages were located on the Thornell Road Bridge near Pittsford and on the State Highway 96 culvert at Bushnell Basin. The location of these four gages can be found on Plate C1. The two existing gaging stations are on Irondequoit Creek (Station No. 0423207) and Allen Creek (Station No. 04232050). The Irondequoit Creek gage is located in East Rochester, NY, just upstream from the Linden Street Bridge. The gage was established in August 1973. Average flow for 6 years of record is 109 ft^3/sec, which is equivalent to 16 inches of runoff a year. The maximum discharge recorded at the Irondequoit Creek gage was 1,480

ft^3/sec on October 1974. The minimum flow was 23 ft^3/sec on 9, 10, and 11 September 1975. The Allen Creek gage is located near Rochester, NY, about 1 mile upstream from the confluence with Irondequoit Creek. The Allen Creek gage was established in November 1959. Average flow for 19 years of record is 34.0 ft^3/sec, which is equivalent to 15.3 inches of runoff per year. The maximum discharge of record was 3,280 ft^3/sec on 17 May 1974, and the minimum daily discharge was 1.7 ft^3/sec on 24 January 1963.

Information regarding these stations can be found in Table C3. Peak discharges can be found on Table C4. Partial duration flows can be found on Tables C5 and C6.

Table C3 - Irondequoit Creek Basin Gaging Station Information

Creek	Location and Type	Miles Upstream of Creek's Mouth	Drainage Area Square Mile	Period of Record
Irondequoit	Pittsford CS[1]	15.25	41.9	1962-1972
Irondequoit	Bushnell Basin CS[1]	13.30	50.3	1962-1972
Irondequoit	Linden Avenue R[2]	7.88	92.8[3]	1973-Present
Allen	Corbetts Glen R[2]	1.14	30.1[4]	1959-Present

1/ CS - Crest-Stage Gage
2/ R - Continuous Stage Recording Gage
3/ Flow from 5.0 square miles noncontributing
4/ Flow from 3.5 square miles noncontributing

Table C4 - Annual Peak Discharge

Date	Peak Annual Discharge in CFS[1]				
	Iron. Ck. Pittsford[2]	Iron. Ck. Bushnell Basin[2]	Iron. Ck. Linden Ave.[3] Q & Gage Ht.(ft)	Allen Ck. Corbett's Glen[3] Q & Gage Ht.(ft.)	
3/30/60	-	-	-	2,100	6.06
2/26/61	-	-	-	890	4.25
3/12/62	1,440	1,250	-	782	4.07
3/17/63	1,040	1,150	-	1,050	4.51
3/15/64	-	476	-	481	3.48
2/8/65	432	-	-	320	3.32
2/11/66	832	518	-	-	
2/13/66	-	-	-	492	4.21
5/11/67	-	-	-	576	4.33
1/30/68	612	318	-	775	4.60

Table C4 - Annual Peak Discharge (Cont'd)

Date	Peak Annual Discharge in CFS[1]					
	Iron. Ck. Pittsford[2]	Iron. Ck. Bushnell Basin[2]	Iron. Ck. Linden Ave.[3] Q & Gage Ht.(ft)		Allen Ck. Corbett's Glen[3] Q & Gage Ht.(ft.)	
4/19/69	960	895	-		790	4.62
12/11/69	750	895	-		715	4.52
3/15/71	-	-	-		874	4.73
1/23/72	1,080	-	-		-	
6/23/72	-	1,200	-		900	4.82
3/17/73	-	-	-		1,080	4.98
5/17/74	-	-	1,340	15.39	3,280	7.42
8/29/74[4]	-	-	1,480	15.64	-	
6/16/75	-	-	-		670	4.43
3/4/76	-	-	1,020	14.73	-	
4/25/76	-	-	-		1,170	5.09
4/25/77	-	-	494	13.48	-	
9/25/77	-	-	-		774	4.58
3/21/78	-	-	-		890	4.74
3/22/78	-	-	842	14.35	-	
9/14/79	-	-	-		935	4.80
3/5/79	-	-	1,350	15.35	-	

1/ USGS water year is October to September.
2/ Information taken from the 1975 Flood Plain Information Report for Irondequoit Creek.
3/ From USGS Water Resources Data for New York.
4/ Barge Canal failed at Bushnell's Basin.

Table C5 - Partial Duration Discharges[1/]
Allen Creek

Date/Time	Discharge (cfs)	Date/Time	Discharge (cfs)
3/30/1960 (0815)	2,100	6/23/1972 (0715)	900
2/26/1961 (0330)	890	11/9/1972 (0730)	578
3/12/1962 (1630)	782	11/26/1972 (1545)	502
3/17/1963 (1900)	1,050	12/6/1972 (1330)	497
3/15/1964 (0545)	481	3/4/1973 (1915)	566
2/13/1966 (2300)	492	3/14/1973 (1645)	486
5/11/1967 (2100)	576	3/17/1973 (1515)	1,080
10/19/1967 (0415)	670	4/5/1973 (0130)	729
11/23/1967 (0845)	597	11/15/1973 (1830)	480
1/30/1968 (0930)	775	12/27/1973 (0545)	436
8/24/1968 (1030)	541	2/22/1974 (1600)	750
11/16/1968 (0330)	466	5/17/1974 (0600)	3,280
11/29/1968 (0130)	506	6/16/1975 (0745)	670
12/4/1968 (1245)	534	2/13/1976 (1830)	482
1/31/1969 (0315)	472	3/4/1976 (1430)	959
4/19/1969 (0745)	790	4/25/1976 (1900)	1,170
6/3/1969 (0230)	604	5/20/1976 (0430)	816
12/11/1969 (0515)	715	6/12/1976 (0900)	788
2/2/1970 (2200)	478	8/13/1976 (0945)	1,070
4/2/1970 (1545)	555	10/21/1976 (0415)	606
8/30/1970 (2315)	452	3/13/1977 (0915)	504
2/27/1971 (1815)	685	9/25/1977 (0315)	744
3/15/1971 (1730)	874	12/15/1977 (0200)	774
8/23/1971 (0345)	611	12/18/1977 (2245)	533

Table C5 - Partial Duration Discharges[1/] (Cont'd)
Allen Creek

Date/Time	Discharge (cfs)
3/14/1978 (2400)	581
3/21/1978 (2000)	889
9/18/1978 (2345)	515
1/1/1979 (1945)	533
3/4/1979 (2200)	919
9/14/1979 (1545)	935

[1/] Flows above a base of 450 cfs.

Table C6 - Partial Duration Discharges[1/]
Irondequoit Creek at Gage

Date/Time	Discharge (cfs)
5/17/1974 (0900)	1,340
10/29/1974 (1900)	1,480
1/30/1975 (0030)	574
2/25/1975 (0915)	775
2/19/1976 (1015)	662
3/4/1976 (1445)	1,020
4/16/1976 (0615)	584
4/26/1976 (1745)	658
5/20/1976 (1030)	670
12/15/1977 (NA)[2/]	720
3/16/1978 (0630)	665
3/22/1978 (1715)	842
1/2/1979 (2015)	571
3/5/1979 (2130)	1,350
9/14/1979 (1530)	575

1/ Flows above a base of 570 cfs.

2/ Not available, recorder inoperative, assume same time as Allen Creek

C1.4.2 Precipitation Gages.

As mentioned in paragraph C1.1.2, there are four precipitation gages located in the vicinity of the Irondequoit Creek Watershed. Listed below are the total precipitation amounts for some of the more notable storms in the basin.

a. 20-25 June 1972 storm (Tropical Storm Agnes):

Honeoye Falls	-	4.92 inches
Macedon	-	4.20 inches
Rochester	-	4.01 inches
East Bloomfield	-	4.97 inches

b. 16-17 May 1974 storm:

Honeoye Falls	-	No Report
Macedon	-	2.95 inches
Rochester	-	3.85 inches
East Bloomfield	-	1.16 inches

c. 17-20 May 1976 storm:

Honeoye Falls	-	Abandoned
Macedon	-	3.26 inches
Rochester	-	1.1 inches
East Bloomfield	-	No Report

d. 13-14 September 1979 storm (Tropical Storm Frederick):

Honeoye Falls	-	Abandoned
Macedon	-	Abandoned
Rochester	-	3.54 inches
East Bloomfield	-	2.69 inches

C1.5 RAINFALL-RUNOFF ANALYSIS

C1.5.1 General.

In all water resource studies, it is of prime importance to understand the hydrologic responses of a watershed to precipitation and snowmelt. Basic hydrologic parameters used to describe these relationships are time-area curves, routing coefficients, loss rate coefficients, and unit hydrographs and their characterizing parameters. This section of the report will deal with the development of these hydrologic parameters. As detailed later in this appendix, these parameters will be used to determine the Standard Project Flood for both Allen and Irondequoit Creeks, and the discharge-frequency curve for Irondequoit Creek and Allen Creek.

C1.5.2 Allen Creek.

The unit hydrograph and loss rate parameters for Allen Creek at the gage were developed using the May 1974 storm flood hydrograph and rainfall pattern with the optimization routine of computer program HEC-1 (723-X6-L2010) developed by the Hydrologic Engineering Center of the Corps of Engineers, Davis, CA. The May 1974 storm flood hydrograph and rainfall pattern can be found on Figure C1. The final results of the unit hydrograph and loss rate parameter studies are as follows using the parameter titles as defined by the computer program.

a. Clarks coefficients for unit hydrograph:

TC = 7.18
R = 13.24

b. Loss rate coefficients:

STRKR = .08
ERAIN = .46
DLTKR = .41
RTIOL = 3.34

An explanation of the loss rate coefficients can be found in the user manual for the HEC-1 program. An explanation of Clark's coefficients for unit hydrograph can be found in any standard text on hydrology.

For Allen Creek, no routing coefficients were needed due to the closeness of the gaging station to the confluence with Irondequoit Creek. Because of the common shape of the standard time-area curve used in the HEC-1 program, it was assumed to be valid for the Allen Creek Watershed. The unit hydrograph for Allen Creek can be seen on Figure C2.

C1.5.3 Irondequoit Creek.

Because of apparent more complex hydrologic responses for Irondequoit Creek, calculation of the unit hydrograph and loss rate parameters for Irondequoit Creek was not as easy as for Allen Creek. Various storms were analyzed, with no consistent results obtained for the loss rate parameters. The final values of the unit hydrograph parameters were taken from the optimization of the May 1974 storm data. The final values of the loss rate parameters were obtained by manipulating the loss rates from the May 1976 storm data to reproduce the May 1974 flood hydrograph. The final results of the unit hydrograph and loss rate parameters studies are as follows:

a. Clarks coefficients for unit hydrograph

TC = 8
R = 26

b. Loss rate coefficients:

STRKR = .30
DLTKR = .83
RTIOL = 1.87
ERAIN = .44

The Irondequoit Creek Watershed is rural in nature, while the Allen Creek Watershed is highly urbanized, thus accounting for the differences in loss rates between the two watersheds.

The May 1974 flood on Irondequoit Creek can be found on Figure C3, and the unit hydrograph can be found on Figure C4. The computer model HEC-1 was used to analysis the various storms. The time-area curve used in the HEC-1 program was assumed to be valid for the Irondequoit Creek watershed.

The value of TC (8 hours) was felt to be a good value after comparing it to the value of TC (TC = 9.0) calculated by the optimization of May 1976 discharge hydrograph (peak = 670 cfs). The value of TC compared reasonably with the value of TC determined by a regional analysis of TC and R done for the Tonawanda Creek Study (1980) (TC = 8.4). The value of R (26) is reasonable because it was found to be the R calculated in the May 1974 (R = 26) and May 1976 discharge hydrograph (26.5) and close to the September 1979 value (20.03).

The value of TC and R used for Irondequoit Creek at the gage are the same values used in the Preliminary Feasibility Report dated July 1979. Only the May 1974 discharge hydrograph (Figure C3) is presented for graphical purposes.

The routing coefficients used for the FFR had been previously developed in the PFR. The Irondequoit Creek watershed was divided into five areas for routing purposes. These areas are:

Area 1 - Upstream of Barge Canal.
Area 2 - From Barge Canal to Upstream of Thomas Creek.
Area 3 - Thomas Creek.
Area 4 - From Thomas Creek to gage on Irondequoit Creek.
Area 5 - From gage to upstream of Allen Creek.

Hydrographs at the upstream side of the Barge Canal were routed through the Barge Canal using a Modified Puls Routing. Routing from the Barge Canal to Thomas Creek was by the Muskingum method. Local flood hydrographs were added at the confluence of Thomas and Irondequoit Creeks. From Thomas Creek to gage, and from gage to upstream of confluence of Allen and Irondequoit, the Muskingum method of routing was used. For the three routing reaches between the Barge Canal and Allen Creek, the Muskingum routing coefficients K = 2 hr and X = 0.1 were used.

The reliability of these routing coefficients are questionable due to the lack of proper data to calibrate the routing coefficients. The routing reaches were originally developed to analyse possible reservoir plans in the upstream reaches of Irondequoit Creek. These reservoir studies were abandoned early in the PFR as being unfeasible. The routing coefficients were developed by routing unit hydrographs through the various reaches to match the unit hydrograph at the gage. Since the unit hydrograph for the reaches were based on the unit hydrograph developed at the gage, there is no need to use the system model in the FFR.

C.1.6 FLOOD PROBABILITY

C1.6.1 Regional Studies.

Streamflow data through water year 1977, for the gaging stations listed in Table C7, were used in a regional frequency study. The locations of these stations can be found on Plate C3. The regional study was undertaken to determine the statistical parameters of mean annual discharge (Qm), standard deviation (s), and skew coefficient (g) for each of the gaging stations. The values of Qm, s, and g were determined using a Log Pearson Type III analysis for each gaging station. Regression analyses were then performed to determine the relationships between drainage area and Qm, s, and g. The results of these studies can be found on Figures C5, C6, C7, and C8. The regional frequency study was taken from the Tonawanda Creek Flood Management Study, dated 1980.

The peak discharge for any frequency can then be calculated by using the formula Log Q peak = Qm + KS, where Qm is the log of Qm, K is a function of the skew (g) and the frequency, and S is the log of the standard deviation(S). Value of K for a given value of g are determined using standardized tables from Water Resources Council Bulletin 17A.

C1.6.2 Discharge-Frequency Curves at Gages.

Discharge-frequency curves were developed for Irondequoit and Allen Creeks at the gages. Various techniques, such as rainfall-runoff analysis, Log Pearson Type III analysis, and regional analyses were used to determine the best discharge-frequency curves for the two creeks.

A discharge-frequency curve for Irondequoit Creek using the rainfall runoff method at the gage was developed using Technical Paper No. 40 (TP-40), "Rainfall Frequency Atlas of the United States, etc." and the unit hydrograph and loss rate parameters discussed in paragraph C1.5.3. A discharge-frequency curve using a regional analysis was also developed using the methodology described in paragraph C1.6.1. The coefficients used for the Log Pearson Type III equations are:

a. Qm = 3.301

b. K = .163

c. g = -.12

Table C7 - USGS Gaging Stations Around the Irondequoit Creek Watershed

Gaging Stations	DA	Period of Record
Little Tonawanda at Linden (04216500)	22.1	1912-1968
		1978-present
Cayuga Creek near Lancaster (04215000)	94.9	1938-1968
		1971-present
Cazenovia Creek at Ebenezer (04215500)	134.0	1940-present
Buffalo Creek at Gardenville (04214500)	144.0	1938-present
Cattaraugus Creek at Gowanda (04213500)	432.0	1939-present
Oatka Creek at Warsaw (04230380)	41.9	1963-present
Ellicott Creek near Williamsville (04218518)	72.4 77.6	1955-1972 1/ 1972-present
Tonawanda Creek at Batavia (04211000)	171.0	1929-1944 2/
		1944-present
Tonawanda Creek at Alabama (04217500)	231.0	1922-1955 3/
		1955-present
Tonawanda Creek at Rapids (04218000)	351.0	1955-1965
		1978-present
Genesee River at Jones Bridge (04227500)	1,419	1910-present 4/
Genesee River at Rochester (04232000)	2,457	1909-present 4/

1/ Gage moved to U. S. Sheridan Drive.
2/ City of Batavia gage during period indicated.
3/ NYS Department of Public Works gage during period indicated.
4/ Only flow data prior to Mt. Morris dam was used.

These two discharge-frequency curves for Irondequoit Creek at the gage can be found on Figure C9. The expected probability curve was developed assuming 20 years of record (amount of record for TPO-40 rainfall). The rainfall-runoff curve was modified to more closely follow the slope of the regional study curve.

One discharge-frequency curve for Allen Creek was developed using a Log Pearson Type III analysis. The Allen Creek watershed has experienced rapid urbanization of the northern part of the watershed which could would lead to discontinuities in the discharge data. Therefore, the discharge data was divided into two periods; 1960 through 1979, and 1969 through 1979. This assumes that the years of changing urbanization can be separated from the years of stability. The peak discharge data for the periods 1960 through 1979, and 1969 through 1979 were analyzed using Bulletin 17A Criteria (Bulletin 17A - Guidelines for Determining Flood-Flow Frequency by the United States Water Resources Council, June 1977). The results of these analyses are found on Figure C10.

Another discharge-frequency curve was developed using the rainfall runoff method. This curve was developed using Technical Paper No. 25 (TP-25), "Rainfall Intensity - Duration-Frequency Curves, Etc." and the unit hydrograph and loss rate parameters for the Allen Creek gage discussed in paragraph C1.5.2. This curve can be found on Figure C10.

An option within the new version of HEC-1 allows for computer calculation of the temporal distribution of precipitation. Total rainfall and excess for Allen Creek and Irondequoit Creek are as follows:

Return Interval	Allen Creek		Irondequoit	
	Rainfall*	Excess*	Rainfall*	Excess*
2 years	1.54	1.02	1.90	.51
5 years	2.35	1.73	2.80	.90
10 years	2.88	2.21	3.35	1.35
25 years	3.13	2.47	3.83	1.67
50 years	3.58	2.90	4.14	1.78
100 years	4.02	3.30	4.23	2.04

* Inches in 24 hours.

TP-25 presents point rainfall intensity-duration-frequency curves for the 203 National Weather Service first order stations in the U. S.; one of those being the station at Rochester, NY. TP-40 is a rainfall-frequency atlas developed from data for first order weather stations, total rainfall stations (24-hour stations), and nonrecording data stations. The rainfall data from these stations was used to develop generalized isohyetals for the United States for given conditions of frequency and duration.

Rainfall patterns developed using TP-25 should be used in areas where first order stations can be used to represent the aerial and temporal distribution of rainfall over a watershed, such as the Allen Creek Watershed. Rainfall patterns developed using TP-40 should be used in areas not represented by first order stations, such as the Irondequoit Creek Watershed.

C1.6.3 Discharge-Frequency Curves in Project Area.

Since the area of study for this report is located downstream from both the Irondequoit and Allen Creek gages, the discharge-frequency curves at each of these gages must be transposed and modified to determine downstream discharge-frequency relationships. To do this, the equation $Q_2/Q_1 = (DA2/DA1)^n$ was used. Q_1 and DA1 are the discharge and drainage area at the gage, and Q_2 and DA2 are the discharge and drainage area for the point downstream from the gage. The value of "n" was calculated by plotting discharge vs. drainage area on log-log paper and computing the slope -(n) (Figure C11).

Figure C11 was developed using data from three storms for various creeks and streams in the western New York area. These storms are the March 1956 storm, the March 1955 storm, and the June 1972 storm. The data used for Figure C11 can be found on Table C8. A value for "n" of .9 was adopted.

Table C8 - March 1955, March 1956, and June 1972 Storms

Gaging Station	Drainage Area (acres)	March 1955 cfs	March 1956 cfs	June 1972 cfs
Cattaraugus	432	19,400	34,600	25,300
Cayuga	93.3	7,900	8,700	-
Cazenovia	134	13,500	13,000	12,300
Little Tonawanda	22	2,460	2,700	-
Buffalo	144	13,000	13,000	12,000
Canasaruga	153	3,990	4,500	9,600
Allen	30.1	-	-	900

Using this equation and the discharge-frequency curves discussed in paragraph C1.6.2, the discharge-frequency curve was determined for Allen Creek at a point just upstream of the confluence of Irondequoit and Allen Creeks. The discharge-frequency curve on Irondequoit Creek at a point just upstream of the confluence of Allen and Irondequoit Creeks was also determined. These curves are shown on Figures C13 and C14, respectively.

Three distinct discharge-frequency curves were developed for the point just downstream from the confluence of Allen Creek on Irondequoit Creek. One curve was developed using the regional studies (paragraph C1.6.1). Another curve was developed using the rainfall-runoff discharge frequency curve (paragraph C1.6.2) of Irondequoit Creek at the gage and moving it downstream by the peak discharge area method discussed in paragraph C1.6.3 and modified to more closely follow the slope of the regional study curve. The final curve was developed using the Allen Creek discharge-frequency curve and two

hydrological events: the May 1974 event and the September 1979 event. For these two events, (the peaks coincidental) the peaks were added together to form two points, that were plotted according to the frequency of the Allen Creek event. These two points were then connected by a straight line to form the discharge-frequency curve at this point.

In June of 1980, there was another major event on Allen Creek in which the timing of the peak on Allen was coincidental with the peak on Irondequoit (at the gages). This event was plotted in the same manner as were the May 1974 and September 1979 events. As can be seen on Figure C12, this event plots very well with the other two events. All discharges given are the values determined at the gages. These discharges were moved downstream using the peak discharge-area method described in Section C1.6.3. The June 1980 event is as follows:

a. Allen Creek

Peak - 1,590 cfs
Time - 8 June 1980 (0600)

b. Irondequoit Creek

Peak - 795 cfs
Time - 8 June 1980 (0730)

These three discharge-frequency curves can be found as Figure C12. The peaks were observed on:

May 1974

Allen - 6:00 a.m. on 17 May 1974
Irondequoit - 9:00 a.m. on 17 May 1974

September 1979

Allen - 4:00 p.m. on 14 September 1979
Irondequoit - 4:00 p.m. on 14 September 1979

The peaks were:

May 1974

Allen - 3,280 cfs
Irondequoit - 1,340 cfs

September 1979

Allen - 935 cfs
Irondequoit - 575 cfs

C1.6.4 Recommended Discharge-Frequency Curves.

The recommended discharge-frequency curves for Allen Creek at the confluence (IP #3) and Irondequoit Creek just upstream (IP #2) and downstream (IP #1) of the confluence are found on Figures C13, C14, and C15, respectively.

The recommended Allen Creek discharge-frequency curve, Figure C13, is the curve developed by the rainfall runoff method (paragraph C1.6.2), Figure C10, and moved downstream. This curve was selected over the Log Pearson Type III curves because of the uncertainty of using the split sample to determine a discharge-frequency curve. Also, the unit hydrographs and loss rate parameters used are indicative of those you would expect from an urbanized area such as Allen Creek.

The discharge-frequency curve for Irondequoit Creek upstream of the confluence with Allen, Figure C14, is the rainfall runoff curve at the gage (paragraph C1.6.2), Figure C9, moved downstream. This curve was selected over the regional curve because it uses unit hydrograph and loss rate parameters which are indicative of the watershed. The lower part of the curve from a 10-year event and lower was reformulated by smoothing the curve to be more closely parallel with the regional frequency discharge curve.

The rainfall-runoff curve, Figure C12, was selected as the recommended discharge-frequency for Irondequoit Creek just downstream from the confluence of Allen (IP #1). This curve is reproduced on Figure C15. This curve was selected because the recommended discharge-frequency curves for Irondequoit and Allen just upstream of the confluence (IP #2 and #3) were constructed in the same manner. In addition, the curve plots between the other two discharge-frequency curves for this point. The discharge-frequency curve created by using the Allen Creek discharge frequency curve is on the low side, considering the drainage areas (31.3 vs 128 square miles). The regional frequency curve is on the high side, because it represents watersheds which have higher amounts of runoff per given unit of rainfall than that indicated by Irondequoit Creek.

Confidence limits were calculated for Allen Creek (IP #3) using the Log Pearson Type III analysis of the peak flows for this period 1969 to 1979. Confidence limits were not developed for index IP #1 and #2 on Irondequoit Creek.

C1.7 STANDARD PROJECT FLOOD

Standard Project Flood (SPF) estimates were prepared for Allen Creek at the mouth and for Irondequoit Creek at the points just upstream and downstream of the confluence with Allen Creek. The SPF is a hypothetical storm based on "the most severe meteorologic conditions considered reasonably characteristic of the geographic region involved."

The SPF was calculated using the SPF options of the HEC-1 computer model. The unit hydrographs for Irondequoit and Allen Creeks at the gages were used,

along with the loss rate coefficients for Allen Creek. Since the loss rate coefficients for Allen Creek allow larger amounts of runoff than those for Irondequoit Creek, it was decided to use the Allen Creek loss rates throughout the watershed. The SPF index was calculated using the guidelines established in Civil Engineer Bulletin No. 52-B (EM 1110-2-1141). This index is the amount of standard project storm rainfall that will fall over a 200 square mile watershed in 24 hours. Using the SPF option in the computer program, the total computed rainfall for Irondequoit Creek was 10.80 inches, with the runoff being 9.24 inches. The total computed rainfall for Allen Creek was 11.01 inches, and the runoff was 9.45 inches.

The SPF hydrograph was calculated at the gage on Irondequoit Creek, routed to the confluence of Irondequoit Creek and Allen Creek where the local SPF hydrograph between Allen Creek and the gage on Irondequoit Creek was added on. The SPF hydrograph for Allen Creek is then added. This procedure gives the peak SPF discharges for the points on Irondequoit Creek. Because of the relatively small increases in drainage area and the conservative procedures used in centering the SPS rainfall over Allen Creek, the peak SPF discharge for Allen Creek was calculated at the gage and translated with no modification to the mouth of Allen Creek. The use of the routing criteria to route the SPF hydrograph at the gage on Irondequoit to the confluence of Allen and Irondequoit was felt to be justified in the case of the SPF. A SPF peak discharge just upstream of the confluence of Allen and Irondequoit Creeks on Irondequoit Creek was calculated using the peak discharge - drainage area method described in Section C1.6.3 and compared favorable with the recommended value (15,600 vs 15,300). For this reason it was felt that the adapted method was the best way to calculate the SPF hydrographs. The peak SPF discharges are as follows:

a. Irondequoit Creek at gage - 15,000 cfs

b. Irondequoit Creek upstream of Allen Creek - 15,300 cfs

c. Irondequoit Creek downstream of Allen Creek - 21,900 cfs

d. Allen Creek at gage - 7,700 cfs

The SPF hydrographs for Irondequoit Creek upstream and downstream of Allen Creek can be found on Figure C16. The SPF hydrograph for Allen Creek can be found on Figure C17.

C1.8 DIFFERENCES FROM PREVIOUS PUBLISHED REPORTS

There have been changes or modifications in hydrology for the Final Feasibility Report (FFR) from the Preliminary Feasibility Report (PFR) and the Flood Plain Information Report (FPI). The largest modification is in the discharge-frequency curves. Below (Tables C9 and C10) is the comparison of the peak 100-year and SPF discharges for various points on Allen and Irondequoit Creeks. There has been a drop in the values for the peak discharges from the PFR to FFR. These changes are a result of a more intensive analysis of historic gage records, regional analysis, and rainfall runoff studies.

Other modifications include a new unit hydrograph and loss rate parameters for Allen Creek. The USGS had modified the rating curve used to convert the stage hydrograph to discharge hydrograph at the gage for the May 1974 event. This modification had the effect of lowering the discharge values from those of the discharge hydrograph used in the PFR. The optimization of the May 1974 event on Allen using the modified discharge hydrograph yield the new parameters.

The loss rate parameters used on Irondequoit Creek were changed. The values used in the PFR were the loss rate parameters from Allen Creek (May 1974). These loss rates were not indicative of the losses calculated in the Irondequoit Creek Watershed. The new loss rate parameters were developed using the procedures outlined in Section C1.5.3.

Table C9 - Comparison of 100-Year Peak Discharges (in cfs)

	FPI 1/	PFR 2/	FFR 3/
Irondequoit Creek at Gage	6,600 4/	-	4,300
Irondequoit Creek Just Upstream of Confluence with Allen Creek	7,300	4,800	4,400
Irondequoit Creek Just Downstream of Confluence with Allen Creek	9,000	8,100	5,300
Allen Creek Just Upstream of Confluence with Irondequoit Creek	-	3,400	3,300

1/ Flood Plain Information Report.
2/ Preliminary Feasibility Report
3/ Final Feasibility Report
4/ Value for point just downstream of Thomas Creek.

Table C10 - Comparison of SPF Peak Discharges (in cfs)

	FPI 1/	PFR 2/	FFR 3/
Irondequoit Creek at Gage	15,800 4/	-	15,000
Irondequoit Creek Just Upstream of Confluence with Allen Creek	17,600	13,300	15,300
Irondequoit Creek Just Downstream of Confluence with Allen Creek	24,200	22,900	21,900
Allen Creek Just Upstream of Confluence with Irondequoit Creek	-	9,600	7,700

1/ Flood Plain Information Report.
2/ Preliminary Feasibility Report
3/ Final Feasibility Report
4/ Value for point just downstream of Thomas Creek.

C1.9 URBANIZATION

The discharge-frequency curves for IP #1, IP #2, and IP #3 will be constant over the planning period. The discharge-frequency curve for Allen Creek (IP #3) was developed using unit hydrograph and loss rate parameters which are indicative of a highly urbanized area. The discharge-frequency curves for Irondequoit Creek (IP #1 and IP #2) are unlikely to change due to the large percentage of agricultural land upstream of the New York State Barge Canal.

C1.10 DAMAGE REACHES AND INDEX POINTS

The location of index points and limits of the damage reaches are shown on Plates 1 and B2. The damage reaches were selected so that areas flooded from the same source and affected similarly by flooding and by the considered plan of improvement would be in the same reach. The index point for each reach was selected as a point at which changes in water surface elevations would be representative throughout the reach. The location of the index points, a brief description of the damage reaches, and the discharges and stages for various frequencies are given in Appendix B. Stage-damage curves at the index points are shown on Plates B5, B6, and B7.

C1.11 RATING CURVES FOR EXISTING CONDITIONS

Stage-discharge curves for existing conditions are required at each index point for use in determining the average annual damages. These stage-discharge relationships at the index points were derived from backwater computations performed using computer program 723-X6-L202A, HEC-2, "Water Surface Profiles" developed by the Hydrologic Engineering Center in Davis, CA. Backwater computations were performed on Irondequoit Creek for discharges ranging from 1,650 cfs to 21,900 cfs. Backwater computations were taken from Station 0+00, which is about 4,000 feet downstream of the project limit, upstream to Station 100+50 (Route 441 Bridge). Critical depth was assumed at Station 43+80, the lower project limit. This rating curve was used for starting water surface elevations for discharges selected for the backwater computations through the project reaches. Discharges were varied along the creek within the project reaches because of the increased inflow at the Allen Creek confluence and also because some flood water escapes over the right bank at about Station 92+65 and enter the creek at Station 55+40.

Backwater computations for discharges ranging from 1,040 cfs to 6,600 cfs were also performed on Allen Creek from its mouth to Station 13+70. Starting water surface elevations for these computations were obtained from the backwater rating curve developed at Irondequoit Creek Station 69+60, the confluence with Allen Creek. Table C11 shows frequencies and discharges used in the backwater computation for Irondequoit Creek. Table C12 shows the coincident Allen Creek and Irondequoit Creek discharges used in computing water surface profiles in Allen Creek. Manning's roughness coefficients ("n") for channel and overbank areas were assumed at 0.03 to 0.05 and 0.03 to 0.08, respectively. Roughness coefficients were varied according to channel degree of conditions, brush in overbank areas, presence of parking areas, depth of flows, and other factors. Expansion and contraction coefficients

used in these computations are 0.4 to 0.5 and 0.2 to 0.4, respectively. The water surface profiles under existing conditions are shown on Figures C18 and C19 for design and SPF flows.

Water surface stages were plotted versus discharges at each index point. Smooth curves were then drawn through these points to complete the rating curves for existing conditions. These stage-discharge curves are shown on Figures C20 through C22. Figure C22 shows the effect of stages from Irondequoit Creek on the stages of Allen Creek for flows greater than 3,500 cfs. Stage on Allen Creek increases sharply and reaches a maximum for a discharge of 6,600 cfs when the coincident SPF discharge of 21,900 cfs occurs in Irondequoit Creek.

Table C11 - Irondequoit Creek Flow Distribution - Existing Conditions

Return Frequency	Discharge CFS					
	Below Sta. 55.40	55.40 to Allen	Allen to 92.65	Above Sta. 92.65	55.40 to 92.65 1/	Allen Creek 2/
2	2,100	2,100	1,800	1,800	0	300
5	2,900	2,900	2,500	2,500	0	400
10	3,500	3,500	2,950	2,950	0	650
50	4,800	4,710	3,890	3,980	90	820
100	5,300	5,120	4,220	4,400	180	900
500	6,600	6,180	4,980	5,400	420	1,200
SPF	21,900	15,400	8,800	15,300	6,500	6,600

1/ Escaped sheet flow around plaza.
2/ Coincident with Irondequoit Creek.

C1.12 RATING CURVES FOR IMPROVED CONDITIONS

Water surface profiles for improved conditions with channels, levees, and floodwalls for 500-year protection were computed. Manning's roughness coefficients are the same as for existing conditions except in the downstream portion where a value of 0.03 was used for riprapped channel in Irondequoit Creek and 0.035 for riprapped channel in Allen Creek. The water surface profiles under improved conditions are shown on Figures C18 and C19 for design and SPF flows. Stage-discharge curves for the improved conditions at the index points are shown on Figures C20 through C22. Channel improvements and levees would have no significant effect on the SPF stages.

Table C12 - Allen Creek Discharge-Frequency

Allen Creek		
Return Frequency	Discharge cfs	Irondequoit Creek 1/
2	1,070	2,108
5	1,600	2,320
10	2,000	2,530
50	2,900	4,050
100	3,300	4,780
500	4,300	6,480
	6,600	21,900
SPF	7,000	21,300

1/ Coincident with Allen Creek

C1.13 STAGE-FREQUENCY CURVES, EXISTING CONDITIONS

Stage-frequency curves for the index points were developed from the existing conditions discharge-frequency curves and stage-discharge curves. The existing conditions stage-frequency curves for three index points are shown on Figures C23 through C25.

C1.14 STAGE-FREQUENCY CURVES, IMPROVED CONDITIONS

Stage-frequency curves for improved conditions were derived from the improved conditions stage-frequency and stage-discharge curves at three index points. The improved conditions stage-frequency curves are shown on Figures C23 through C25. Figures C24 shows that the stages for improved conditions would be higher than those existing for rare floods because of the levee improvements. However, for frequent floods, the flow would be within the channel and the downstream improvements would reduce the stages, resulting in a lower stage for improved conditions than for existing conditions.

C1.15 FURTHER STUDIES REQUIRED DUE TO SENSITIVITY ANALYSIS

The recommended alternative was re-evaluated using the 500-year discharge (7,700 cfs at IP No. 1, 5,600 cfs at IP No. 2) developed by the regional discharge-frequency method discussed in Section C1.6.1. The purpose of this procedure was to explore the sensitivity of the recommended plan. Preliminary results indicate that for the 7,700 cfs Plan, the levee-floodwall system along Irondequoit Creek and the floodwall-channel improvement along Allen Creek would have to be larger than for the recommended plan, although

it would be smaller than for the SPF protection plan. For example: to handle the required discharges, the levee and floodwall along Irondequoit Creek would have to be approximately 1/2 to 1-1/2 feet higher than the recommended plan (depending upon location along the creek).

These alterations necessitated by using a different discharge-frequency curve, would increase the cost of the project, but the additional cost would be partially offset by an increase in benefits. The recommended plan, with a B/C ratio of 1.63 and net average annual benefits of $286,500, can absorb approximately 1.9 million dollars in additional cost before the B/C ratio goes below unity. This calculation does not account for the increased average annual benefits due to use of a higher discharge-frequency curve. Thus, the preliminary results of the sensitivity analysis indicate that the B/C ratio would remain positive, even if the alternative frequency-curve and project features were used.

To insure the proper design, the Buffalo District recommends the continued operation of the three gaging stations in the vicinity of the proposed project. These gages are the Allen Creek gage, the Irondequoit Creek gage at Linden, and a recently installed (USGS) gage downstream from the confluence of Allen and Irondequoit Creeks. These gages would be funded under the Corps General Coverage category of the Cooperative Stream Gaging Program. The data collected between pre- and post-authorization study phases will be used to refine estimates of discharges and corresponding frequencies during Phase I GDM studies. This will result in the most reasonable basis for final design of the levee heights in the project area. Two of the three stations are required for continued operation after construction is completed to monitor project performance and to assess project benefits yearly. Funding for these gages after construction of the project will be provided under the Corps O&M category of Inspection of Completed Projects.

SECTION 2 - HYDRAULIC DESIGN

C2.1 GENERAL

Structural improvements considered for the reduction of flood damages in the vicinity of the confluence to Irondequoit and Allen Creeks consist of channelization, levees, floodwalls, and drop structures. Plate 1 of the Main Report shows a plan view of the considered improvements.

C2.2 DESIGN DISCHARGES

The design discharges for the considered plans of improvement were selected to provide the highest degree of protection and involved some of the following considerations:

a. Provision of an adequate degree of protection for the type and degree of development in the flooded area;

b. Maintenance of maximum capacity available through the existing structures without extensive alterations or replacement;

c. Preservation of the natural environment where feasible;

d. Maximization of benefits from considered improvements;

e. Consistency with good flood plain management practices, particularly those associated with the National Flood Insurance Program.

Discharges with 50-, 100-, 500-year, and SPF exceedence intervals were considered for the different alternatives.

The design discharges selected for the considered plans of improvement were: 4,300 cfs for Allen Creek, 6,600 cfs for Irondequoit Creek downstream of the Allen Creek confluence, and 5,400 cfs for Irondequoit Creek upstream of the Allen Creek confluence. These discharges have an exceedence interval of approximately once in 500 years.

C2.3 CHANNEL DESIGN

Channel improvements were designed for reaches about 900 feet long on Allen Creek and about 1,250 feet long at the downstream end of the project on Irondequoit Creek. Channel grades were established from backwater computations made in accordance with instructions contained in EM 1110-2-1409 "Backwater Curves in River Channels." Manning's roughness and energy loss coefficients used in the backwater computations are given in paragraph C1.5.2 and C1.5.3. Channel sections were designed with a trapezoidal cross section having side slopes 1 vertical on 2.5 horizontal.

C2.4 BANK PROTECTION

Bank protection would be provided upstream and downstream of bridges, on the outside of sharp channel bends, and at locations where the average

velocities would exceed the allowable channel velocities. The detailed description and criteria used in designing bank protection are described in Section C1.12 and in Appendix E.

C2.5 SELECTED PLAN

Several different plans of improvements were considered for the flood control measures on Irondequoit and Allen Creeks. Separate plans were designed to provide protection from floods with 50-, 100-, 500-year, exceedence and for the SPF for the area in the vicinity of the Allen and Irondequoit Creek confluence. The details of the selected plan presented in the Main Report are summarized in the following paragraph.

The selected plan would provide a 500-year protection in the project area. The design discharge is 6,600 cfs for Irondequoit Creek and 4,300 cfs for Allen Creek. Channel improvements such as deepening and widening of the existing creek would be required for about 900 feet of Allen Creek and for Irondequoit Creek between Stations 48+38 and 60+95. The remaining reach of Irondequoit Creek would be kept natural for fish habitation considerations. The levees and floodwalls would be set back as far as possible from the channel. Stream velocities would range from 3.5 to 4.0 feet/second in Irondequoit Creek and 4.0 to 7.0 feet/second in Allen Creek. However, the average velocities would be increased in the vicinity of bridges, constricted sections, and bends. These areas would be protected with riprap. The channel bottom of Allen Creek would be deepened and a 3-foot trapezoidal drop structure would be included at the upstream end to bring the channel bottom to natural level and to bring the flow to existing conditions. Since the velocities would be low and the levees set back, a 2-foot freeboard was used in all levee designs.

SECTION 3 - INTERIOR FLOOD CONTROL

C3.1 GENERAL

For alternatives such as floodwalls or levees, the runoff from the drainage area immediately adjacent to the structures would be blocked from entering the stream and pond behind the structure. To mitigate this situation, interior flood control structures must be designed. These structures vary from a single application to a combination of culverts, ponding areas, and pumps.

C3.2 DRAINAGE AREA

C3.2.1 General.

The drainage area adjacent to the recommended levees and floodwall was divided into four distinct areas. These areas were delineated by the natural runoff patterns for the area behind the line of protection. These four areas are shown on Plate C4.

C3.2.2 Area 1.

Area 1 is defined as the 8-acre area that contributes runoff behind the line of protection around the bowling alley located just upstream from the Panorama Trail Bridge on the right bank of Irondequoit Creek.

C3.2.3 Area 2.

Area 2 is defined as the 22-acre area that contributes runoff adjacent to the line of protection along the right bank of Irondequoit Creek from Penfield Road to Panorama Road.

C3.2.4 Area 3.

Area 3 is defined as the 58-acre area that contributes runoff adjacent to the line of protection on Allen Creek and along the left bank of Irondequoit Creek from Allen Creek to Panorama Trail.

C3.2.5 Area 4.

Area 4 is defined as the 42-acre area that contributes runoff adjacent to the line of protection along the right bank of Irondequoit Creek downstream from the Penfield Road Bridge.

C3.3 RAINFALL-RUNOFF ANALYSIS

C3.3.1 Unit Hydrograph and Loss Rate Parameters.

Clarks TC and R unit hydrograph coefficients were developed for each of the four areas by first calculating TC and the 100-year peak discharge using the Soil Conservation Service's Technical Release No. 55, "Urban Hydrology for Small Watersheds." Clarks R coefficient was then developed

by assuming an initial value of R to compute a peak discharge using HEC-1. R was then adjusted until the 100-year peak discharge calculated using HEC-1, matched the peak discharge obtained from TR-55. This was done for all four areas and the results are:

1. Area 1, TC = 0.17, R = 0.40
2. Area 2, TC = 0.34, R = 0.50
3. Area 3, TC = 0.26, R = 0.50
4. Area 4, TC = 0.12, R = 0.35

The loss rates calculated from the May 1974 storm on Allen Creek were used to calculate the losses for the four drainage areas. These loss rates are described in Section C1.5.2.

C3.3.2 Interior Flood Hydrographs.

Seven rainfall events were developed using TP-25 rainfall-intensity curves for the Rochester, NY, precipitation gage. These events have return intervals of 2, 5, 10, 25, 50, 100, and 500 years. In addition, a Standard Project Storm was developed using the guidelines established in Civil Engineer Bulletin No. 52-B (EM-1110-2-1141). The total 3-hour rainfall and runoff amounts for each of these eight events are as follows:

Event	Rainfall (inches)	Runoff (inches)
2	1.08	0.88
5	1.67	1.43
10	2.07	1.82
25	2.54	2.27
50	2.84	2.57
100	3.29	3.00
500	4.14	3.82
SPF	5.64	5.25

Very little additional rainfall fell after 3 hours, thus the rainfall analyses were done for the critical 3 hours of rainfall to save on computations.

The interior flood control hydrographs for the four areas were developed using the TC and R unit hydrograph coefficients and loss rates described in Section C3.3.1, the TP-25 and SPF rainfall values discussed above, and the computer program HEC-1. The time-area curve and rainfall pattern were developed by options within the HEC-1 computer program.

The peak inflow discharges calculated for each area and their return interval are as follows:

Return Interval	Area 1	Area 2	Area 3	Area 4
2	6	16	49	48
5	10	25	76	74
10	13	32	98	96
25	15	38	116	112
50	17	45	136	131
100	20	51	154	149
500	25	64	194	187
SPF	25	65	200	189

C3.4 STAGE-DAMAGE CURVES

Stage-damage curves were developed for each of the four areas. The stage-damage curves were developed using the September 1977 Flood Damage Survey and assuming still pool levels behind the levees or floodwalls. These stage-damage curves can be found on Figures C26 through C29.

C3.5 INTERIOR FLOOD CONTROL ALTERNATIVES

C3.5.1 General.

Using the interior flood hydrographs developed in Section C3.3.2 and the Interior Drainage Flood Routing (23-J2-L279) computer model developed by the Hydrologic Engineering Center, different interior flood control alternatives were investigated. The results of these studies can be found on Plate C4. The interior flood control alternatives discussed below are for Alternative B, the recommended flood control plan.

The interior flood control alternatives were evaluated under two conditions: gravity flow and pressure flow. Gravity flow can be defined as flow through a culvert in which the outlet is above the water surface of the creek, and the inlet is under a hydraulic head. Pressure flow is the condition where both ends of the culvert have a hydraulic head on them.

Pressure flow was evaluated using the 100-year, average 1-day discharges from flow duration curves derived using the U. S. Geological Survey's Watstore Computer Program and data files. Water surface elevations in the creek were developed by using a backwater curve. The 100-year, average 1-day discharges are 800 cfs for IP #1, 560 cfs for IP #2, and 240 cfs for IP #3. Water surface elevations are 266.0 feet for area 1, 264.1 feet for area 2, 265.30 feet for area 3, and 264.0 feet for area 4.

For areas 2 and 4, some sort of drainage system, such as an open ditch along the levees or floodwalls, would be needed to convey the storm runoff to the collection areas. In area 2, a small culvert would be needed under the Plaza Extension Road. In area 4, a small culvert would be needed under the old Penfield Road. SPF protection is provided by the interior flood control plan.

C3.5.2 Area 1.

Various sizes of culverts were evaluated for area 1 by using the Interior Drainage Flood Routing Program. Analysis showed that a 2-1/4-foot diameter culvert with a drop inlet would be adequate to pass the flood hydrographs through the levee. The invert of the creek side of the pipe would be at elevation 263.0 and the invert of the drop inlet inside the levee would be at elevation 267.0. An emergency sluice gate and flap gate would also be provided. A ponding area up to elevation 271.0 would be required. Under blocked conditions, the ponding area would completely surround the bowling alley. Although the bowling alley would suffer no physical damages, the 2-foot culvert is needed to relieve these waters. In addition, from a health standpoint, it would not be desirable to leave standing water behind the levee. The blocked condition is the condition where the levee is in place, but no interior flood control outlets have been provided. This condition is used mainly to develop the existing stage-frequency curves for the ponding areas.

Peak discharge through the culvert for the 100- and 500-year events and the SPF are: 100 year - 20 cfs, 500 year - 25 cfs, and SPF - 25 cfs.

C3.5.3 Area 2.

Various sizes of culverts were evaluated for area 2 using the Interior Drainage Flood Routing Computer Program. Analysis showed that a 3-foot culvert and drop inlet would be adequate to pass the flood hydrographs through the levee. The invert of the creek side of the culvert would be at elevation 261.0. The invert of the drop inlet would be at elevation 262.0. An emergency sluice gate and flap gate would also be provided. A ponding area up to elevation 268.0 would be required. Peak discharges through the culverts for the 100- and 500-year events and the SPF are: 100 year - 50 cfs, 500 year - 63 cfs, and SPF - 64 cfs.

C3.5.4 Area 3.

Various sizes of culverts were evaluated for area 3 using the Interior Drainage Flood Routing Computer Program. Analysis showed that a 4 foot by 5 foot box culvert with a hooded inlet would be adequate to pass the flood hydrographs through the levee. The creek side invert of the box culvert would be at elevation 260.0, while the invert of the hooded inlet would be at elevation 261.0. An emergency sluice gate and flap gate would be provided. A ponding area up to elevation 269.0 would be required. Peak discharges through the culverts for the 100- and 500-year events and the SPF are: 100 year - 152 cfs, 500 year - 174 cfs; and SPF - 175 cfs.

C3.5.5 Area 4.

Various sizes of culverts were evaluated for area 4 using the Interior Drainage Flood Routing Computer Program. Analysis showed that a 4 foot by 6 foot box culvert with a drop inlet would be required. The creek side invert of the box culvert would be at elevation 259.0 and the drop inlet invert would be at elevation 261.0. An emergency sluice gate and flap gate

would also be provided. A ponding area up to elevation 267.0 would also be required. Peak discharges through the culverts for the 100- and 500-year events and the SPF are: 100 year - 144 cfs, 500 year 182 cfs, and SPF - 183 cfs.

C3.6 PONDING AREAS

Even with the addition of interior flood control culverts to the levee/floodwall structures, some water will still be ponded by the levee/floodwall. Although this area of ponding water will not affect existing structures, easement must be provided to insure that no future development is built up in the ponding area. The ponding sizes are as follows:

	Ponding Elevation (feet)	Ponding Area (acres)	Duration of Ponding (hours)
Area 1	271	0.7	1
Area 2	268	3.0	1
Area 3	269	2.0	3
Area 4	267	3.0	1

These values are for the Standard Project Flood for Interior Flood Control. The ponding areas can be found on Plate C5.

C3.7 STAGE-FREQUENCY CURVES

C3.7.1 Existing Conditions.

Stage-frequency curves were developed for each of the four areas for existing conditions by assuming complete ponding of the interior flood hydrographs behind the levees. Elevations for the return intervals of 2, 5, 10, 25, 50, 100, 500, and SPF were calculated using the area-capacity curve for each area and the total volume of direct runoff for each hydrograph for each area. These area-capacity curves can be found as Figures C30 through C33. For area 1, once the elevation behind the levee reaches 272.5, flow would go over the Panorama Trail, so for practical purposes, the pool behind the levee in area 1 will not go above elevation 272.5. Stage-frequency curves for existing conditions can be found on Figures C34 through C37.

C3.7.2 Improved Conditions.

Stage-frequency curves for the improved conditions were calculated using the results of the Interior Flood Routing Program. These curves can be found on Figures C34 though C37.

C3.7.3 Benefits and Costs.

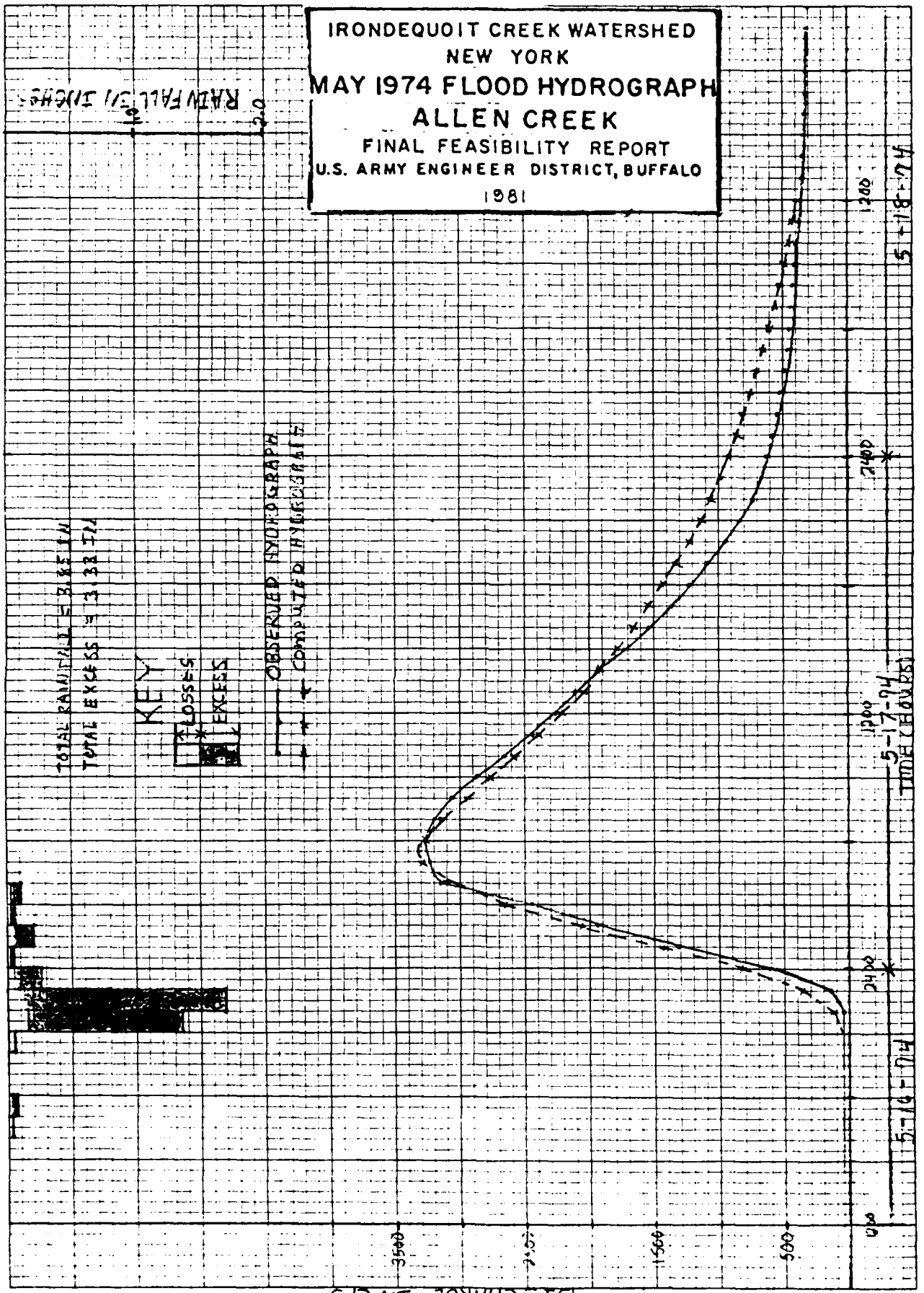
Average annual benefits resulting from the installation of interior flood control structures were calculated as the difference between existing and residual average annual damages. Since each of the improved condition

stage-frequency curves were below the zero damages for each area, the average annual benefits would be:

Area 1 - not calculated (see Section C3.5.2)
Area 2 - $9,200
Area 3 - $30,800
Area 4 - $9,100

Average annual costs would be:	Benefits/costs ratios for each area would then be:
Area 1 - $5,800	Area 1 - not calculated (see Section C3.5.2)
Area 2 - $7,800	Area 2 - 1.18
Area 3 - $7,800	Area 3 - 3.95
Area 4 - $13,700	Area 4 - 0.66

Because of the unique character of the Penfield Plaza area, it was decided to protect for the SPF for Interior Flood Control. Section C3.5.2 explains that the B/C ratio for Area 1 was not calculated. Areas 2 and 3 each have a separate B/C ratio greater than unity. Although the B/C ratio for Area 4 is below unity, this value is misleading. Intangible benefits, and benefits that are categorized as public and other, were not included in the benefit calculation for the four areas. In addition, there is a Rochester Gas & Electric transformer station in Area 4. Damages to the transformer begin at elevation 267. It is imperative that this site remain dry so that there is no interruption of electric service. For these reasons, SPF protection is required for Interior Flood Control for Area 4.


IRONDEQUOIT CREEK WATERSHED
NEW YORK
MAY 1974 FLOOD HYDROGRAPH
ALLEN CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
RAINFALL IN INCHES
TOTAL RAINFALL = 3.88 IN
TOTAL EXCESS = 3.38 IN
KEY
LOSSES
EXCESS
OBSERVED HYDROGRAPH
COMPUTED HYDROGRAPH
5-17-74
5-18-74
TIME (HOURS)
DISCHARGE IN CFS

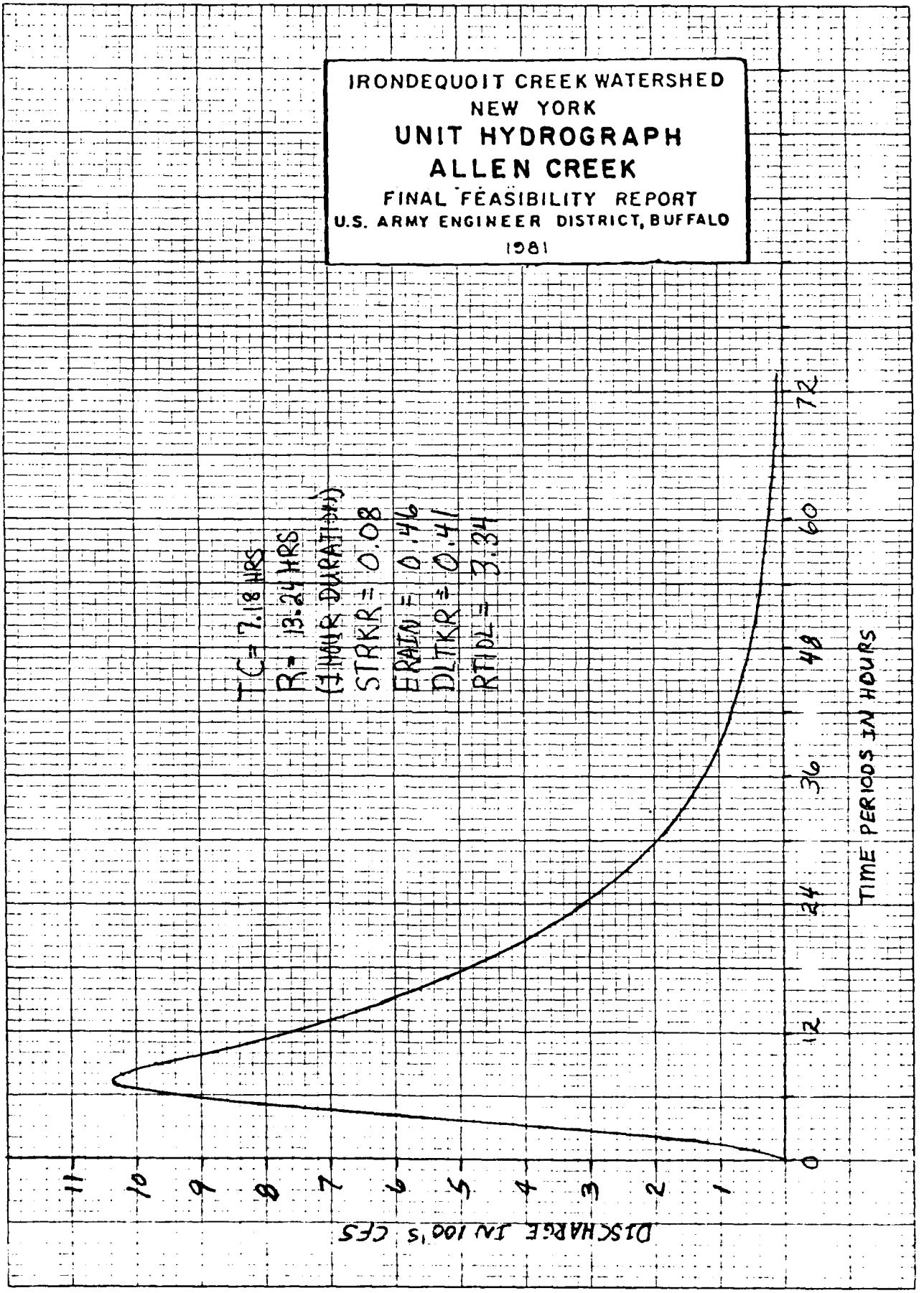
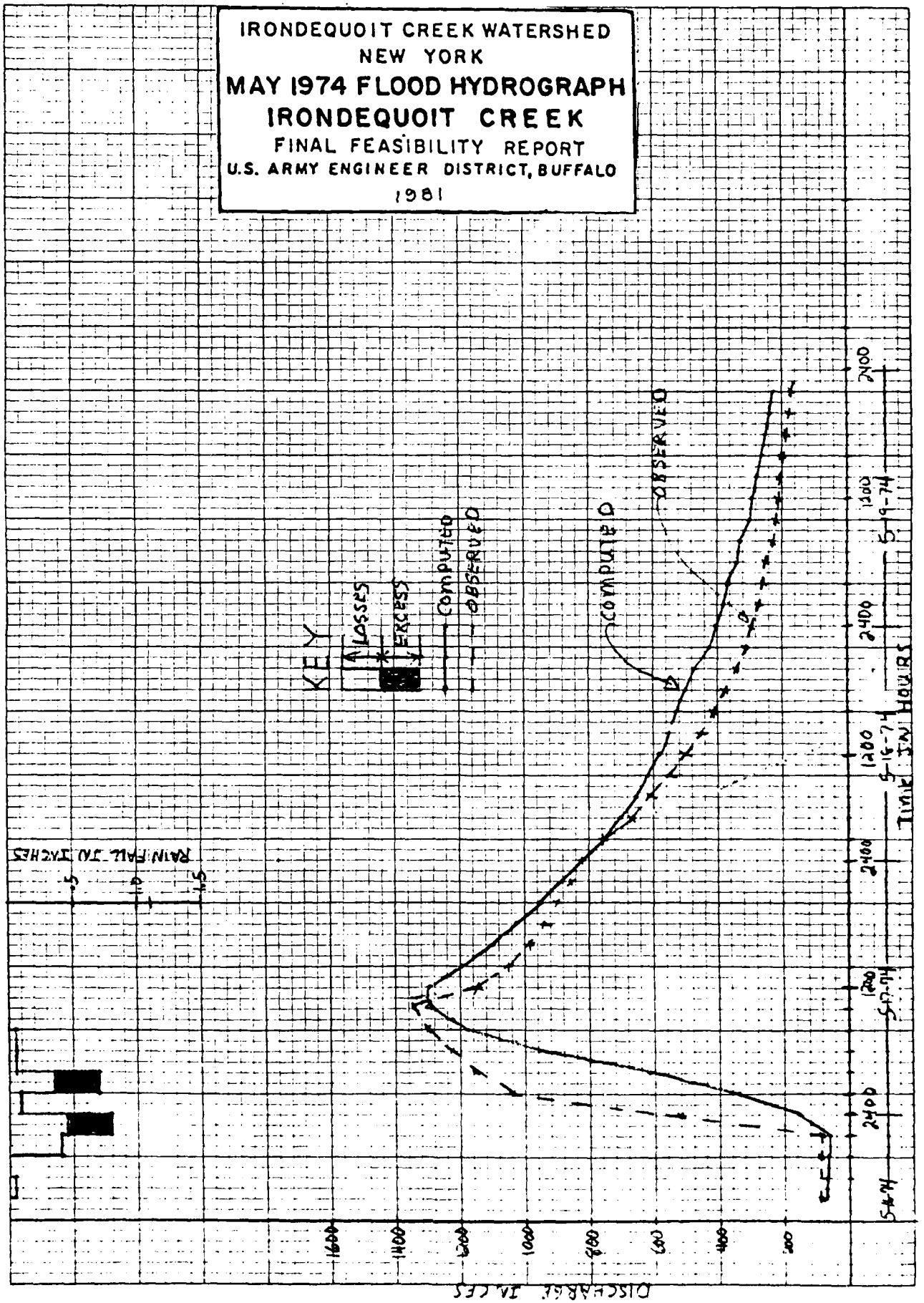
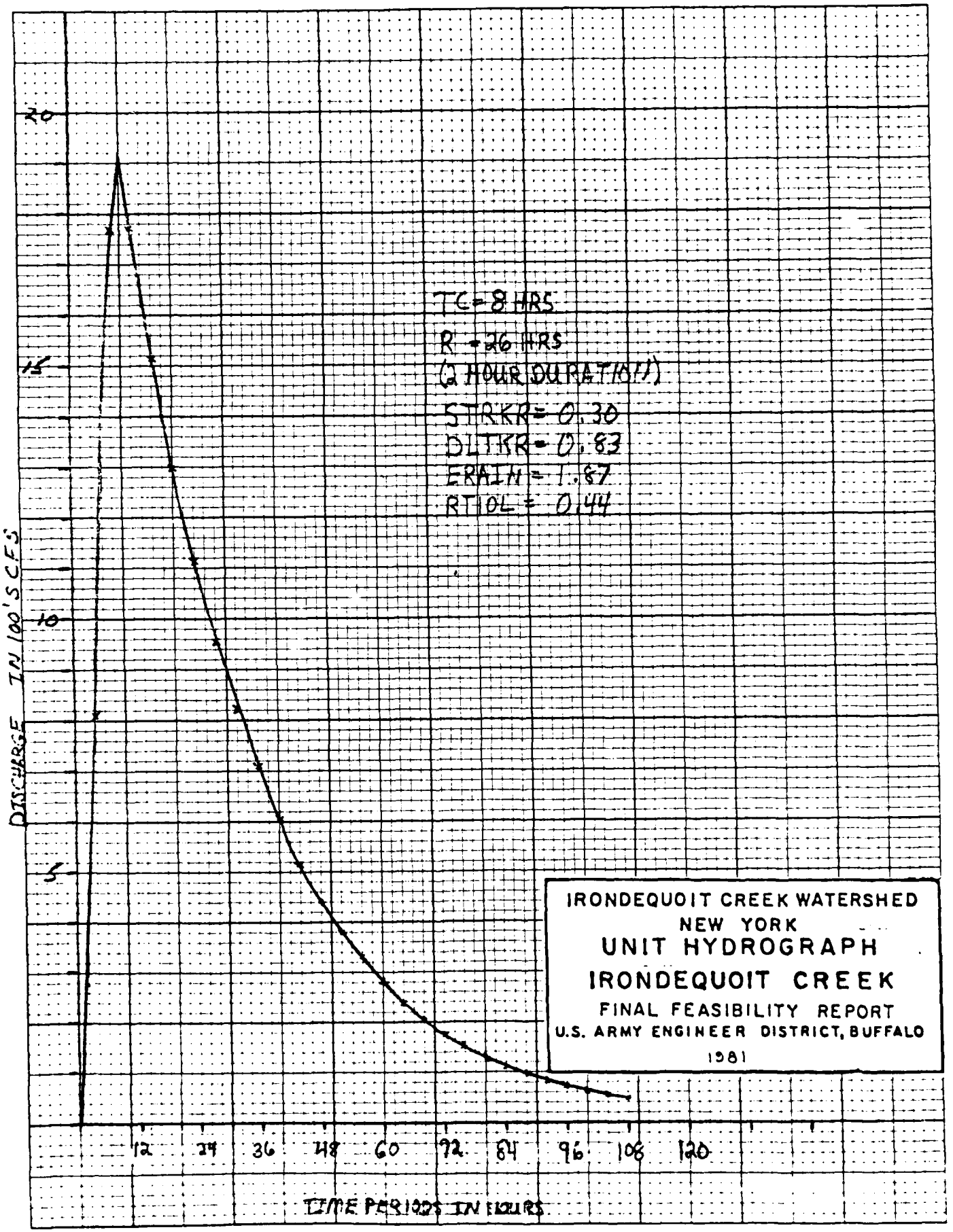

IRONDEQUOIT CREEK WATERSHED
NEW YORK
UNIT HYDROGRAPH
ALLEN CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
TC= 7.18 HRS
R= 13.24 HRS
(1 HOUR DURATION)
STRKR = 0.08
ERAIN = 0.46
DLTKR = 0.41
RTIDL = 3.34
DISCHARGE IN 100's CFS
TIME PERIODS IN HOURS
0
12
24
36
48
60
72
1
2
3
4
5
6
7
8
9
10
11

FIGURE C 2


IRONDEQUOIT CREEK WATERSHED
NEW YORK
MAY 1974 FLOOD HYDROGRAPH
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
KEY
LOSSES
EXCESS
COMPUTED
OBSERVED
COMPUTED
OBSERVED
RAIN FALL IN INCHES
DISCHARGE IN CFS
TIME IN HOURS
5-14
5-15-74
5-16-74
5-17-74
5-18-74



IRONDEQUOIT CREEK WATERSHED
NEW YORK
UNIT HYDROGRAPH
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C4

46 1020
K&E 11 X 10 TO 5/8 INCH • KEUFFEL & ESSER CO

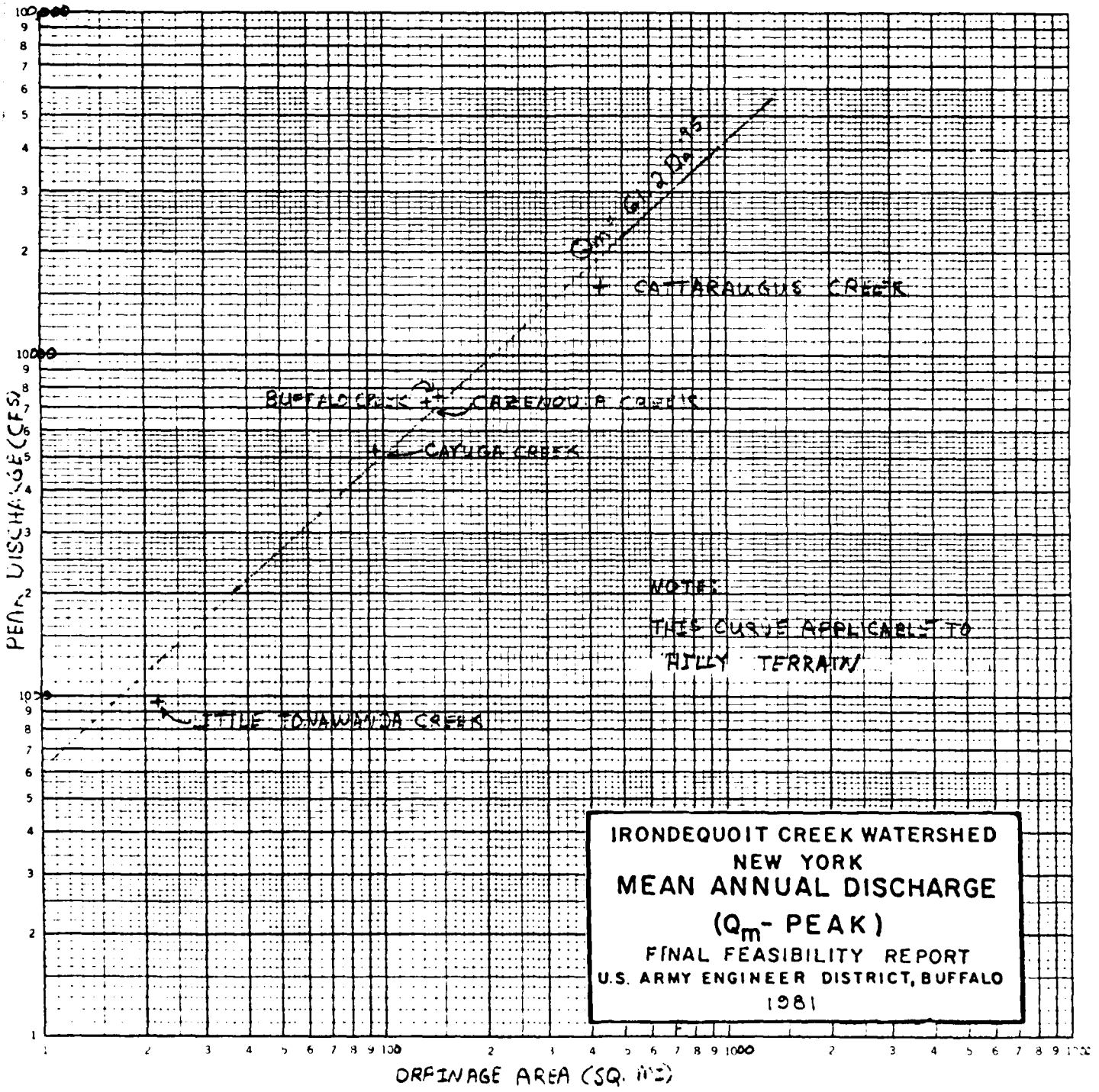

PEAK DISCHARGE (CFS)
DRAINAGE AREA (SQ. MI.)
CATTARAUGUS CREEK
BUFFALO CREEK
CAZENOVIA CREEK
CAYUGA CREEK
LITTLE TONAWANDA CREEK
NOTE:
THIS CURVE APPLICABLE TO
HILLY TERRAIN
IRONDEQUOIT CREEK WATERSHED
NEW YORK
MEAN ANNUAL DISCHARGE
(Q_m - PEAK)
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C5

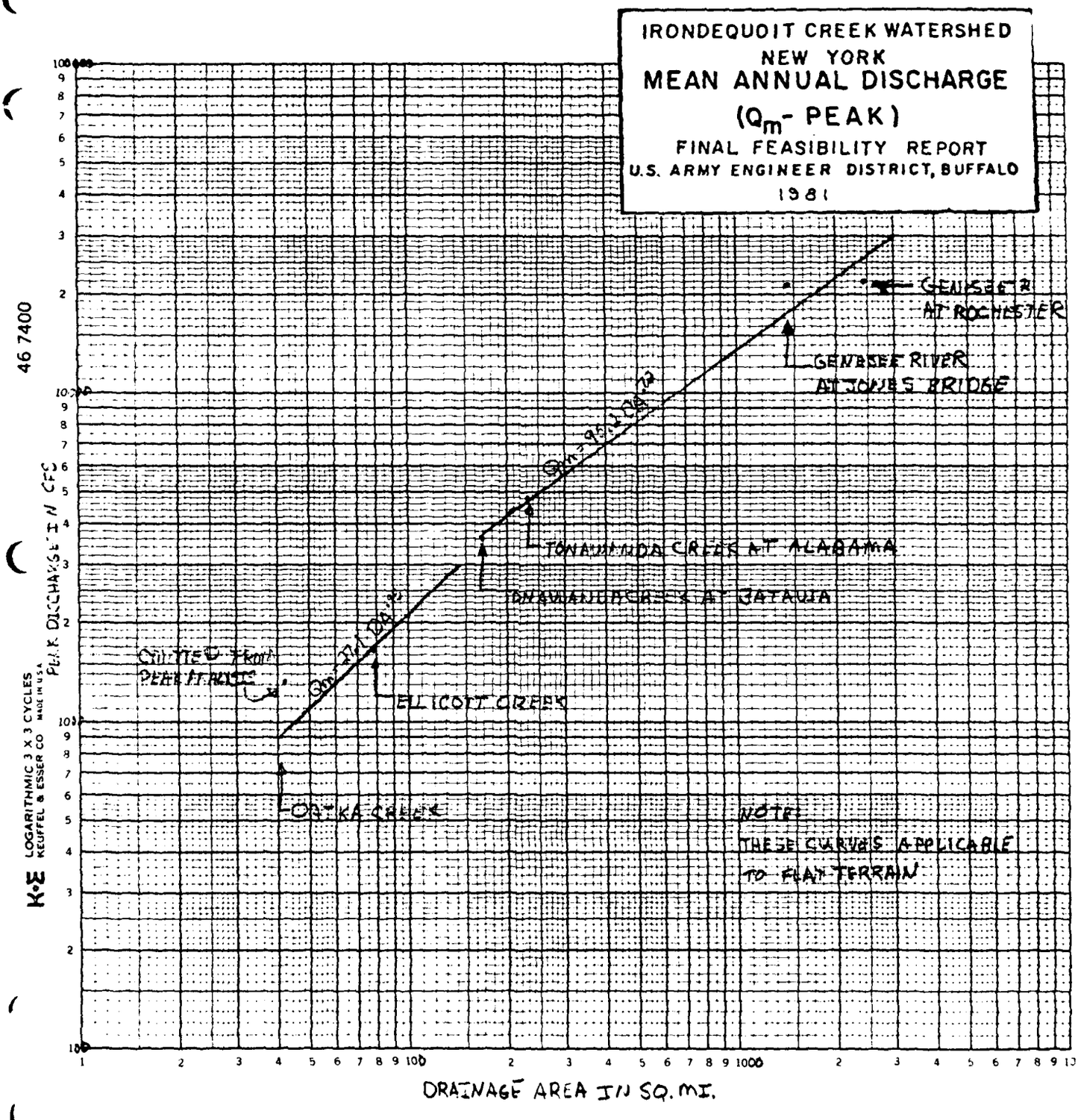

IRONDEQUOIT CREEK WATERSHED
NEW YORK
MEAN ANNUAL DISCHARGE
(Q_m - PEAK)
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
46 7400
PEAK DISCHARGE IN CFS
DRAINAGE AREA IN SQ. MI.
GENESEE R AT ROCHESTER
GENESEE RIVER AT JONES BRIDGE
TONAWANDA CREEK AT ALABAMA
TONAWANDA CREEK AT BATAVIA
ELLICOTT CREEK
OATKA CREEK
NOTE:
THESE CURVES APPLICABLE TO FLAT TERRAIN
LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO MADE IN U.S.A.

FIGURE C6

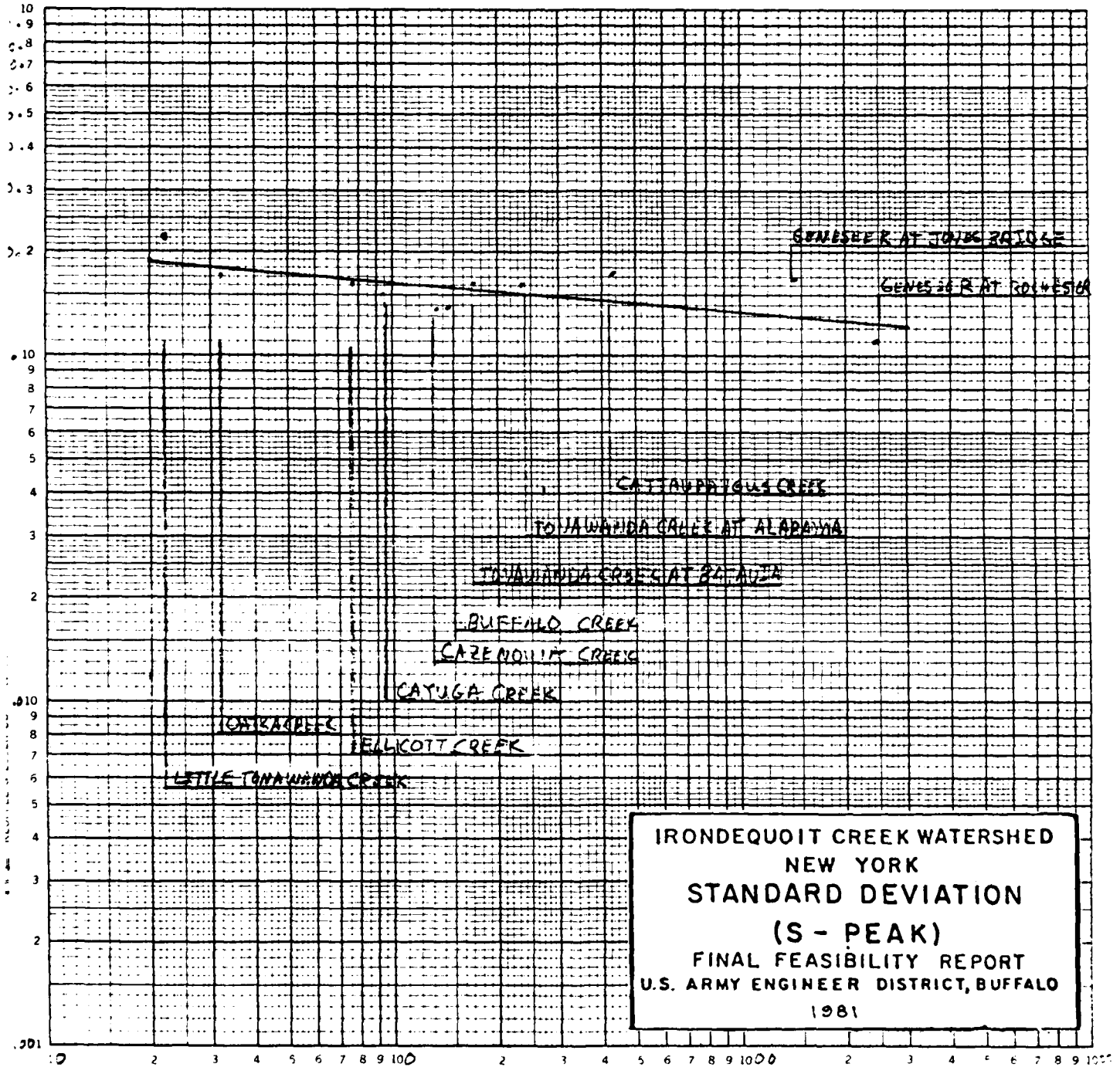

GENESEE R AT JOHNS RIDGE
GENESEE R AT ROCHESTER
CATTARAUGUS CREEK
TONAWANDA CREEK AT ALABAMA
TONAWANDA CREEK AT BATAVIA
BUFFALO CREEK
CAZENOVIA CREEK
CAYUGA CREEK
CONRAD CREEK
ELLICOTT CREEK
LITTLE TONAWANDA CREEK
IRONDEQUOIT CREEK WATERSHED
NEW YORK
STANDARD DEVIATION
(S - PEAK)
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C7

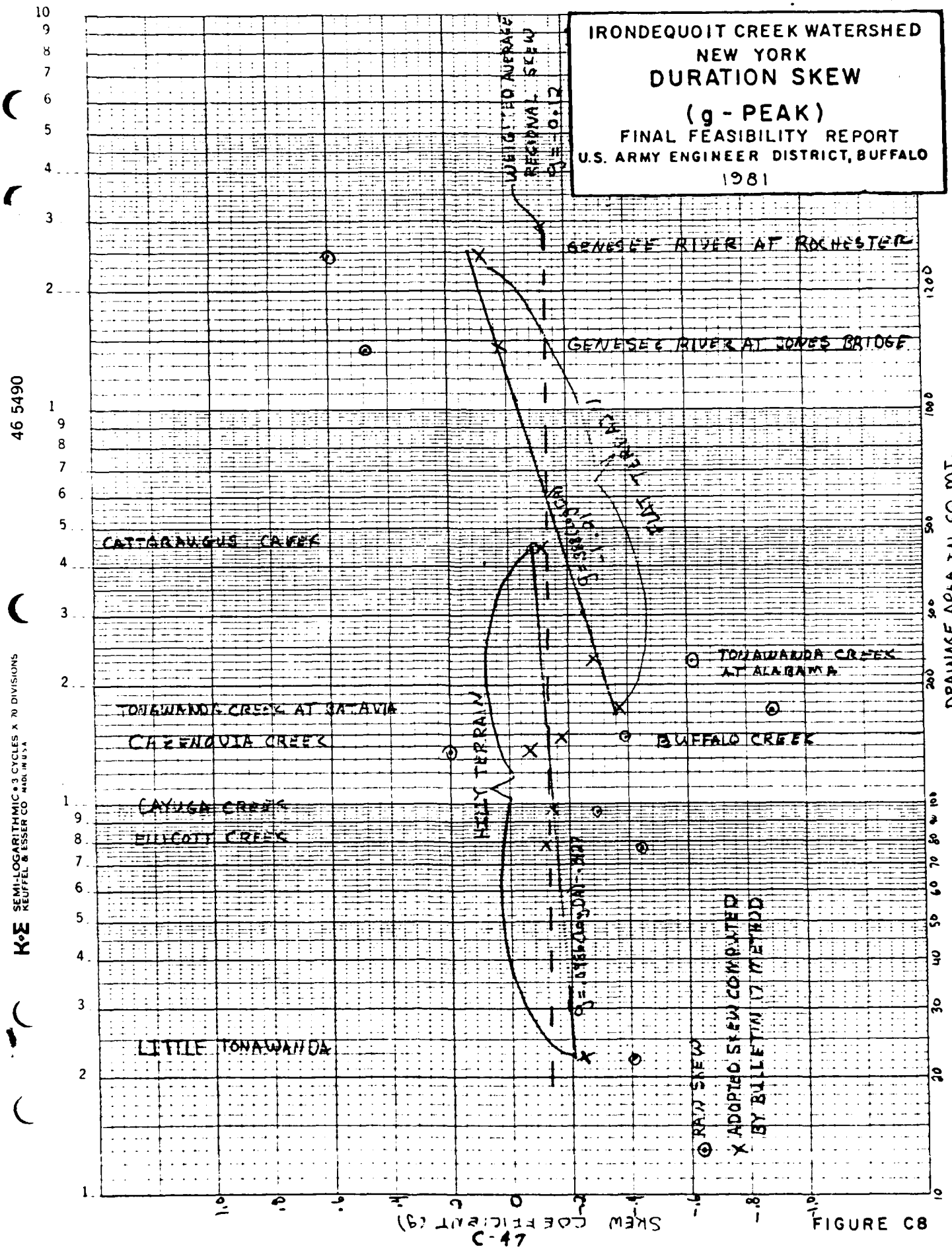
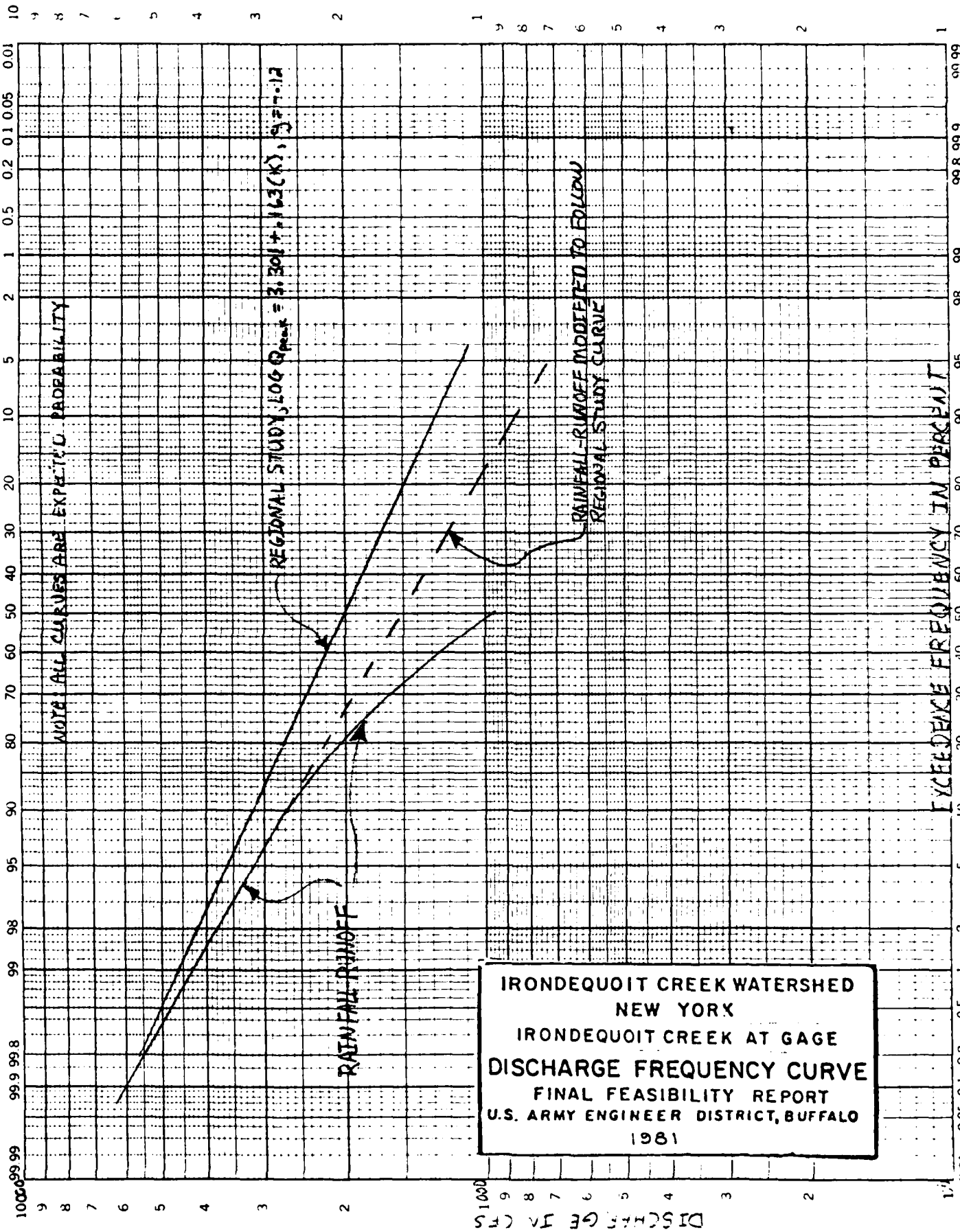

IRONDEQUOIT CREEK WATERSHED
NEW YORK
DURATION SKEW
(g - PEAK)
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
WEIGHTED AVERAGE REGIONAL SKEW
GENESEE RIVER AT ROCHESTER
GENESEE RIVER AT JONES BRIDGE
CATTARAUGUS CREEK
TONAWANDA CREEK AT ALABAMA
TONAWANDA CREEK AT BATAVIA
BUFFALO CREEK
CAZENOVIA CREEK
CAYUGA CREEK
ELLICOTT CREEK
LITTLE TONAWANDA
HELLY-TERRAIN
FLAT
RAW SKEW
ADOPTED SKEW COMPUTED BY BULLETIN 17 METHOD
DRAINAGE AREA IN SQ. MI.
SKEW COEFFICIENT (g)
46 5490
K&E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.

FIGURE C8



IRONDEQUOIT CREEK WATERSHED
NEW YORK
IRONDEQUOIT CREEK AT GAGE
DISCHARGE FREQUENCY CURVE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C9

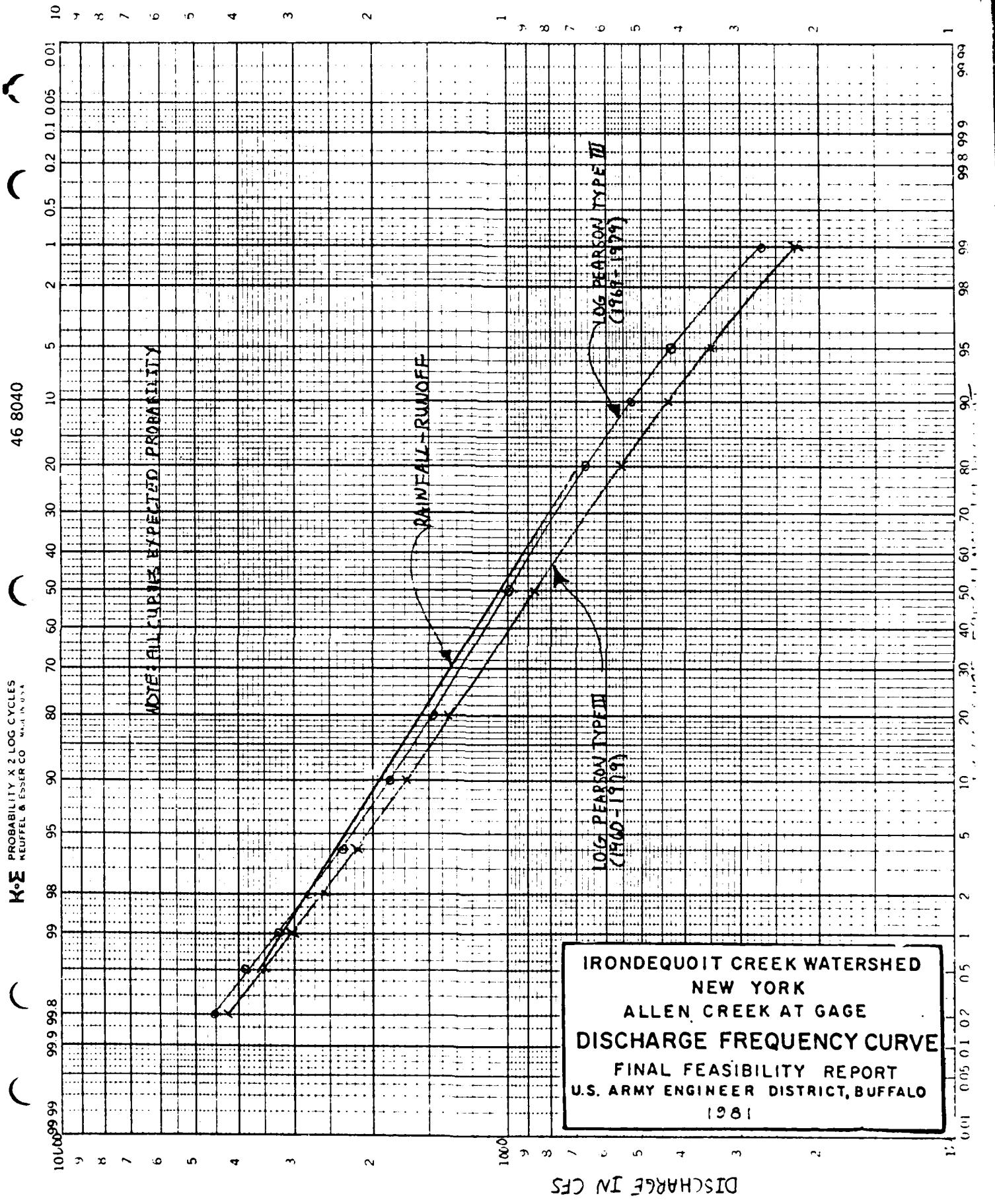

K&E PROBABILITY X 2 LOG CYCLES
KEUFFEL & ESSER CO
46 8040
MOTE: ALL CURVES EXPECTED PROBABILITY
RAINFALL-RUNOFF
LOG PEARSON TYPE III
(1968-1979)
LOG PEARSON TYPE III
(1960-1979)
IRONDEQUOIT CREEK WATERSHED
NEW YORK
ALLEN CREEK AT GAGE
DISCHARGE FREQUENCY CURVE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
DISCHARGE IN CFS

FIGURE C10

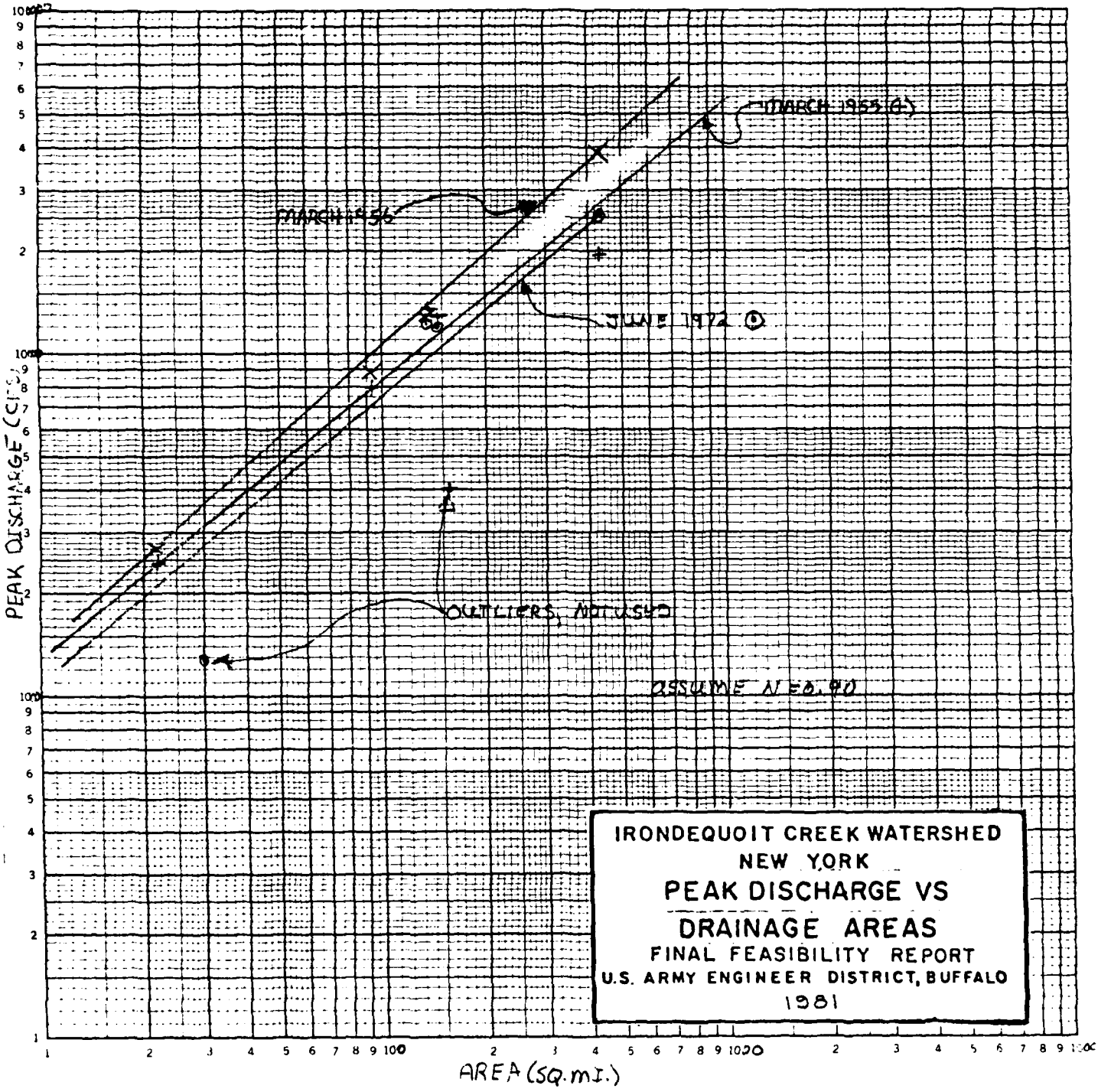

MARCH 1955 (A)
MARCH 1956
JUNE 1972 (D)
OUTLIERS, NOT USED
ASSUME N = 0.90
PEAK DISCHARGE (CFS)
AREA (SQ. MI.)
IRONDEQUOIT CREEK WATERSHED
NEW YORK
PEAK DISCHARGE VS
DRAINAGE AREAS
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C11

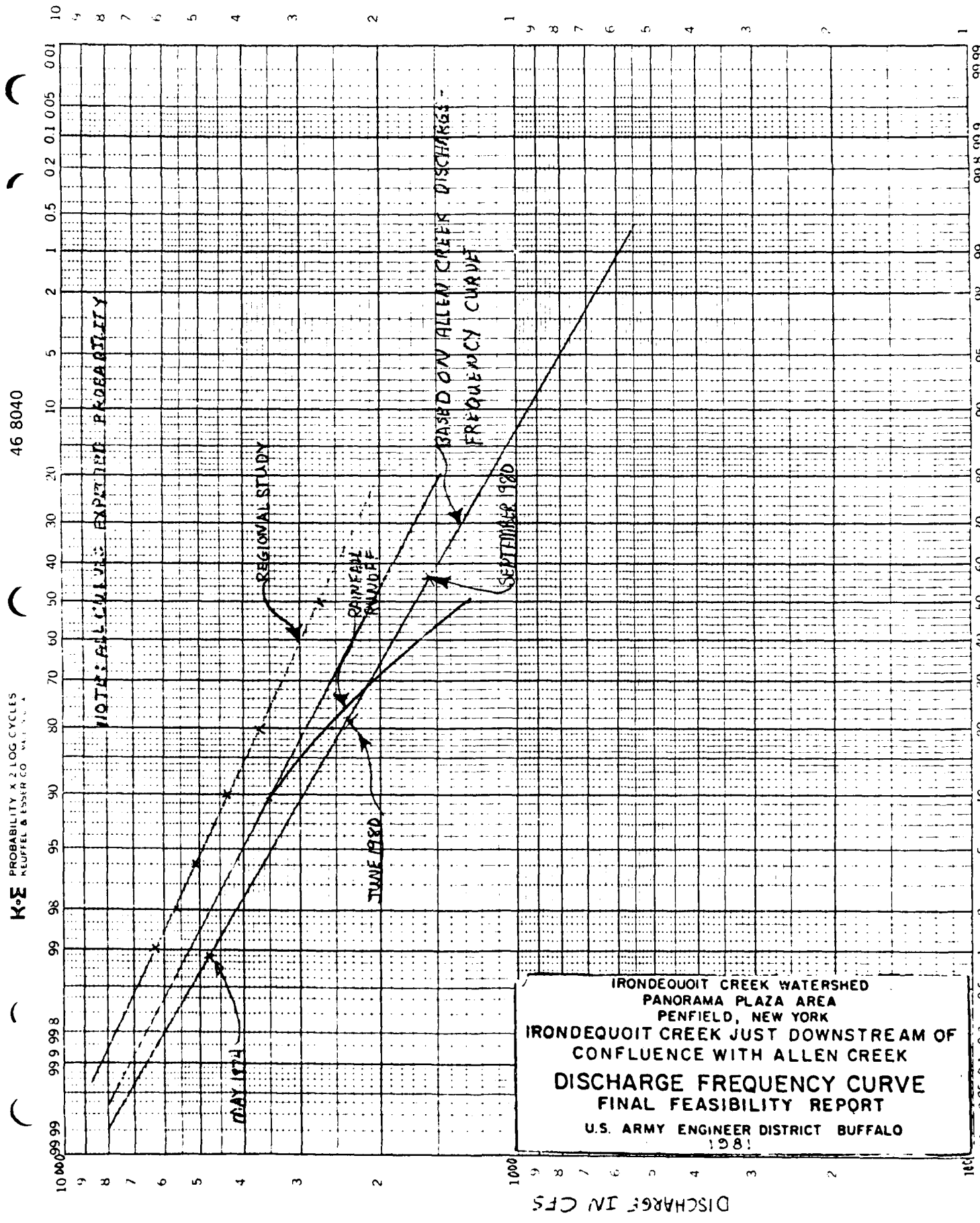

K·E PROBABILITY X 2 LOG CYCLES
KEUFFEL & ESSER CO
46 8040
NOTE: ALL CURVES EXPRESS PROBABILITY
BASED ON ALLEN CREEK DISCHARGES -
FREQUENCY CURVE
SEPTEMBER 1980
REGIONAL STUDY
RAINFALL RUNOFF
JUNE 1972
MAY 1974
DISCHARGE IN CFS
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
IRONDEQUOIT CREEK JUST DOWNSTREAM OF
CONFLUENCE WITH ALLEN CREEK
DISCHARGE FREQUENCY CURVE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C12

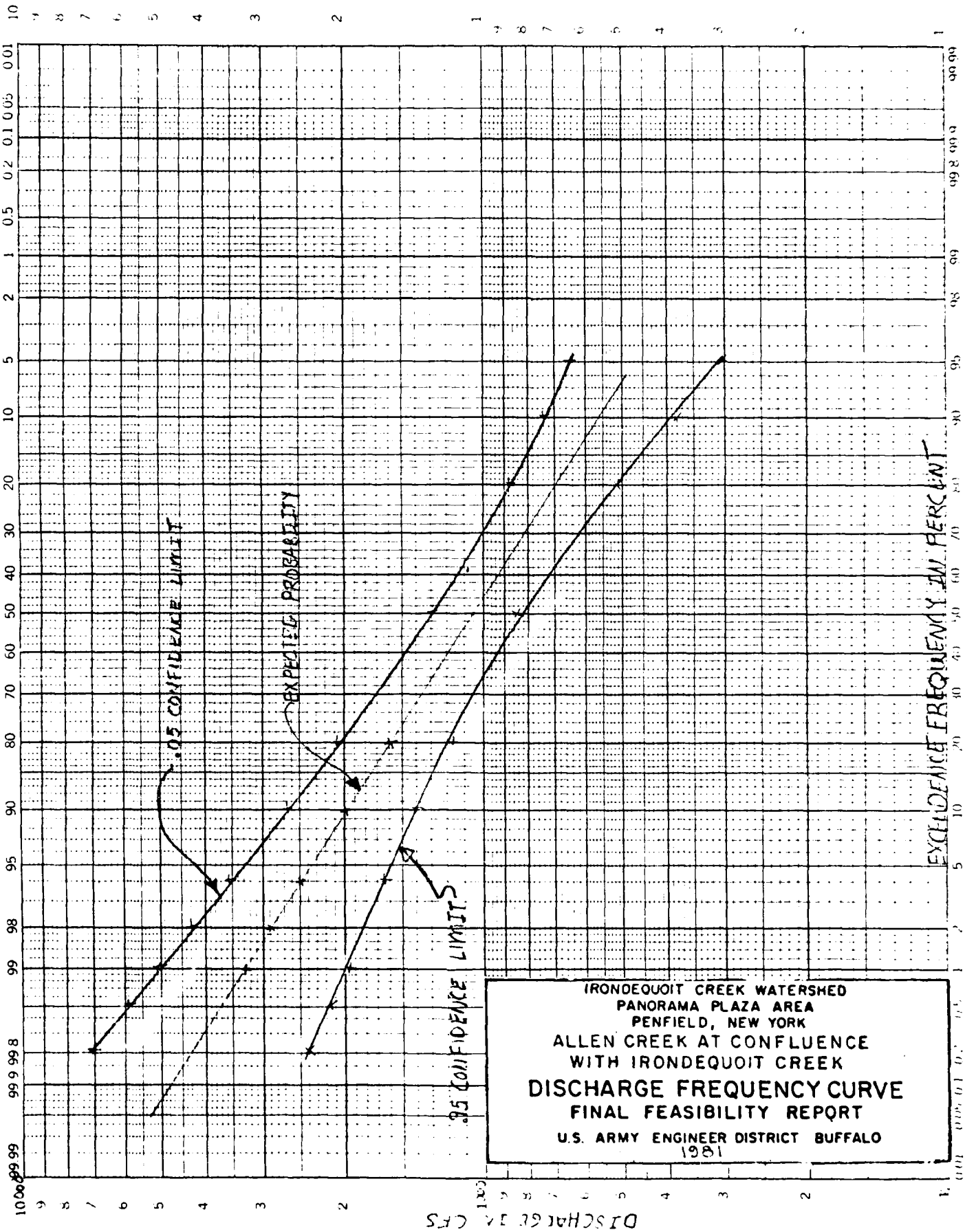

.05 CONFIDENCE LIMIT
EXPECTED PROBABILITY
.95 CONFIDENCE LIMITS
EXCEEDENCE FREQUENCY IN PERCENT
DISCHARGE IN CFS
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
ALLEN CREEK AT CONFLUENCE
WITH IRONDEQUOIT CREEK
DISCHARGE FREQUENCY CURVE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C13

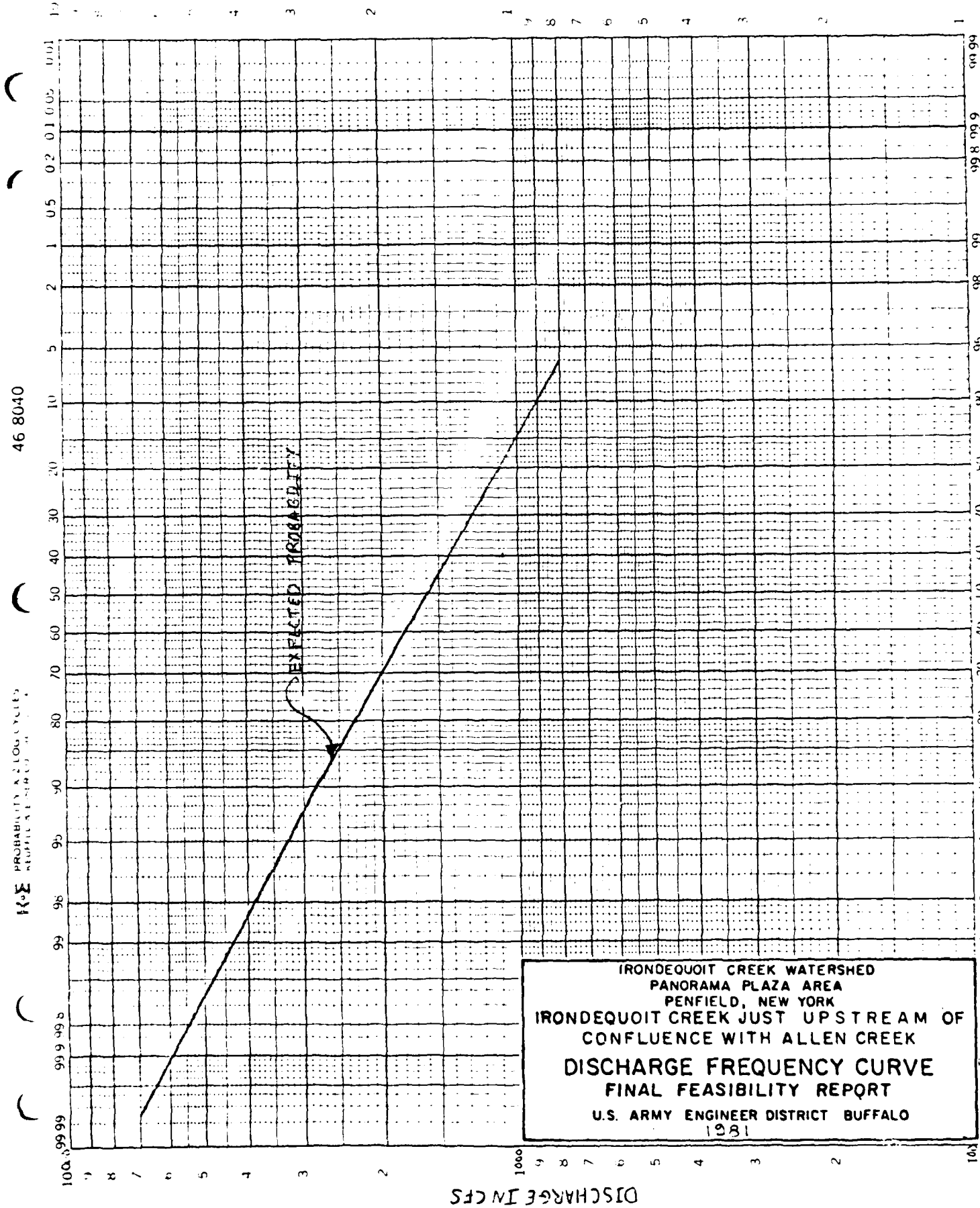

EXPECTED FREQUENCY
DISCHARGE IN CFS
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
IRONDEQUOIT CREEK JUST UPSTREAM OF
CONFLUENCE WITH ALLEN CREEK
DISCHARGE FREQUENCY CURVE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C14

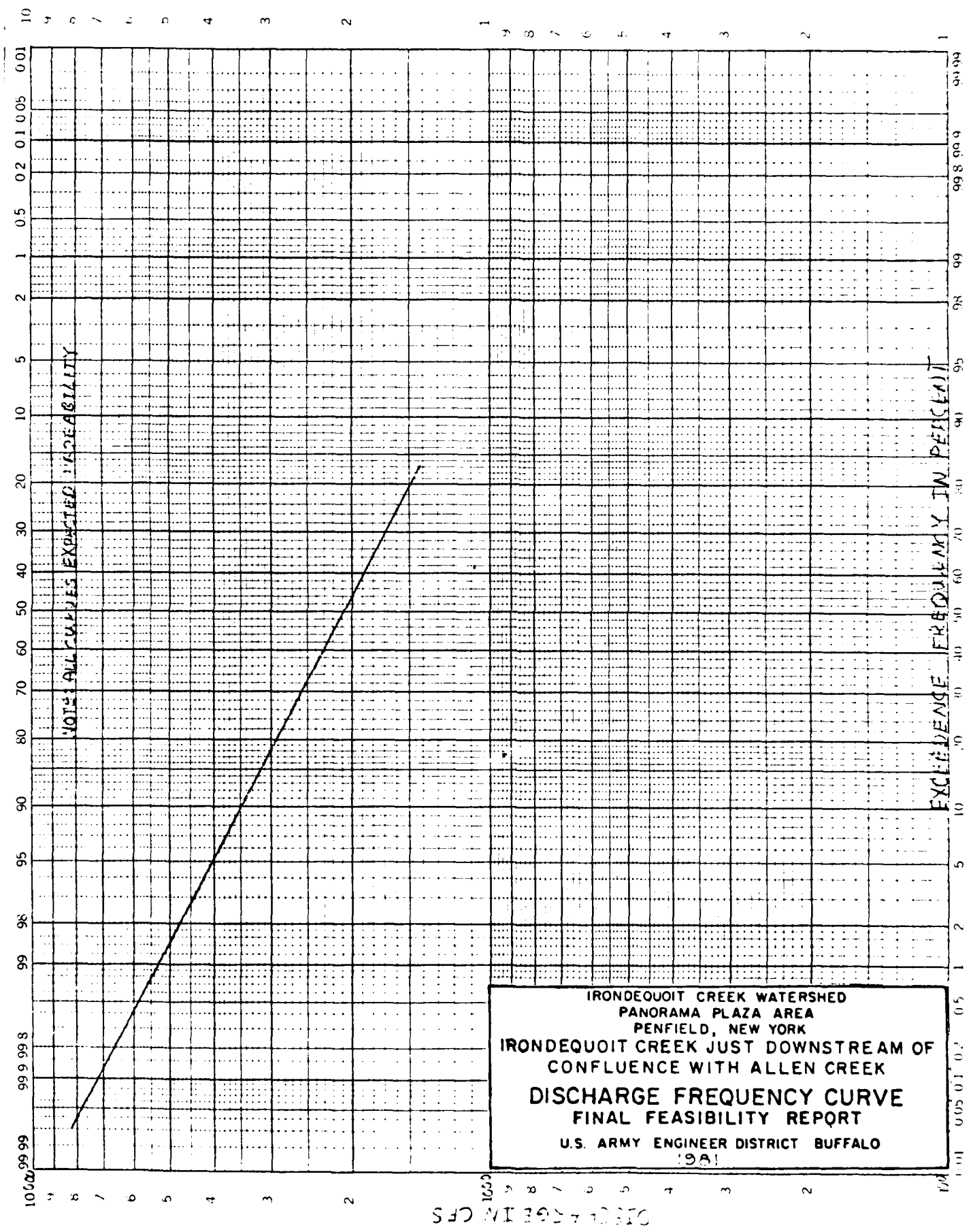

NOTE: ALL CURVES EXPECTED FEASIBILITY
EXCEEDENCE FREQUENCY IN PERCENT
DISCHARGE IN CFS
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
IRONDEQUOIT CREEK JUST DOWNSTREAM OF
CONFLUENCE WITH ALLEN CREEK
DISCHARGE FREQUENCY CURVE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C15

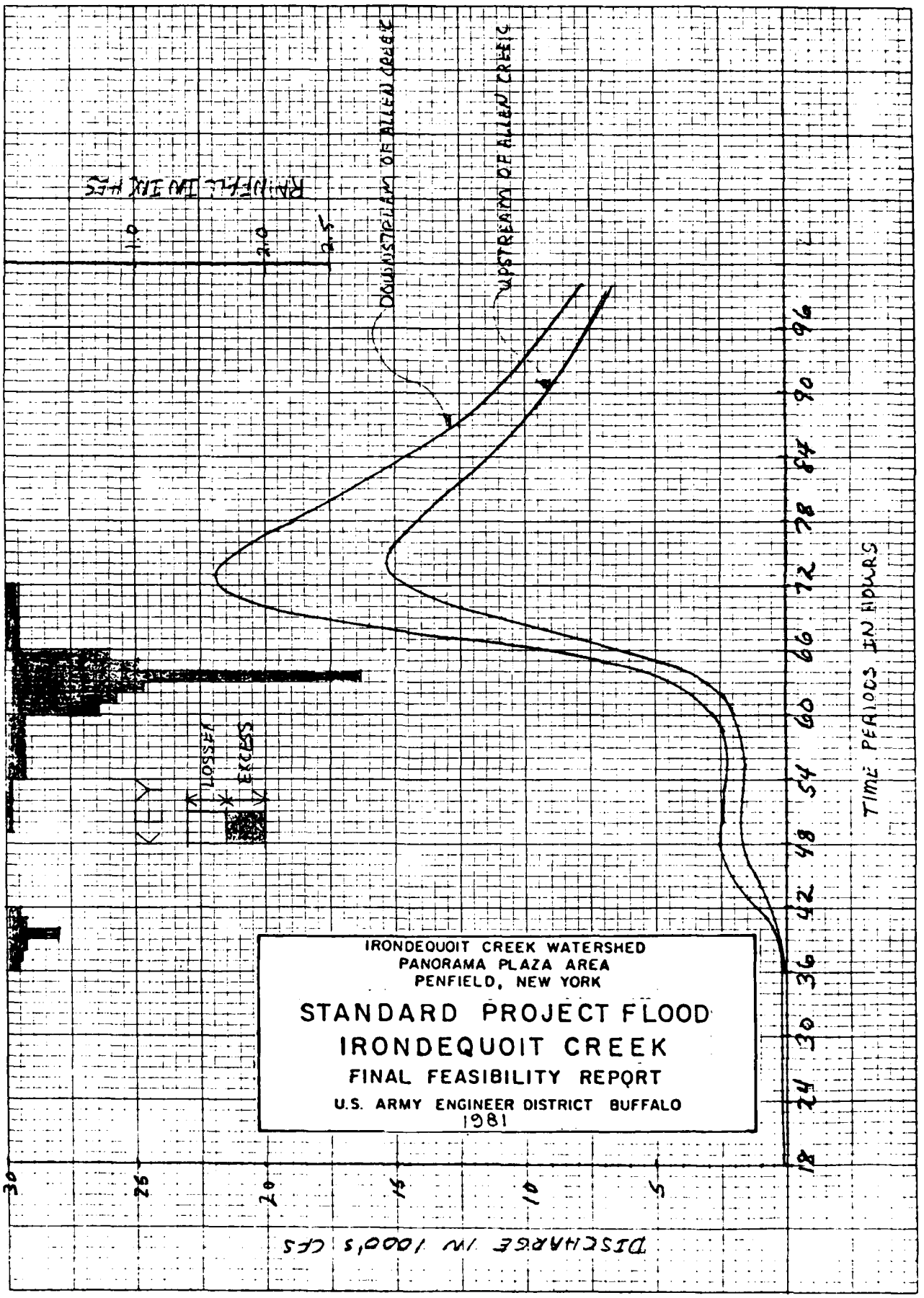

RAINFALL - INCHES
1.0
2.0
2.5
DOWNSTREAM OF ALLEN CREEK
UPSTREAM OF ALLEN CREEK
KEY
LOSSES
EXCESS
TIME PERIODS IN HOURS
6
12
18
24
30
36
42
48
54
60
66
72
78
84
90
96
DISCHARGE IN 1000's CFS
30
25
20
15
10
5
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
STANDARD PROJECT FLOOD
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C16

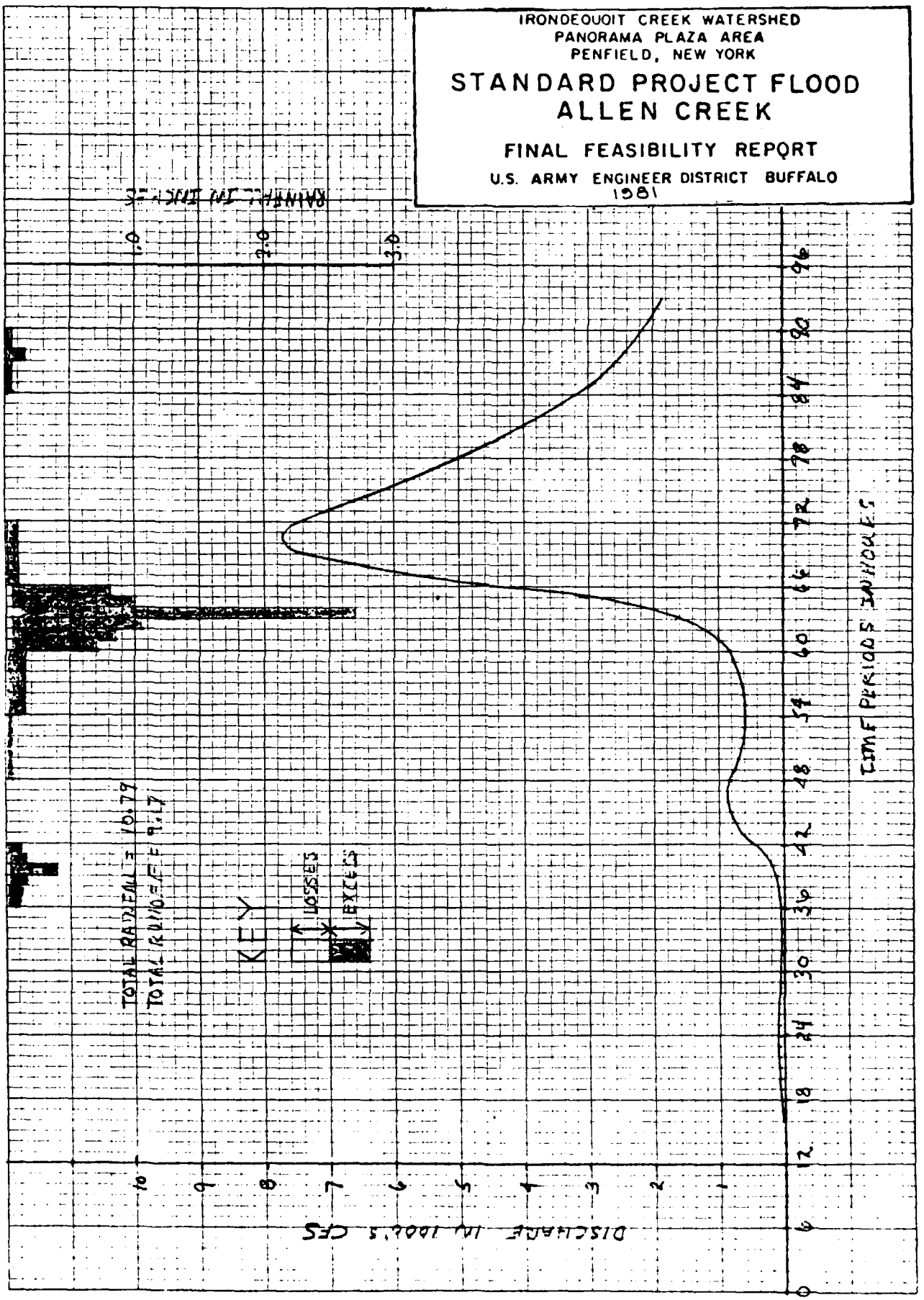


FIGURE C17

KEUFFEL & ESSER CO.

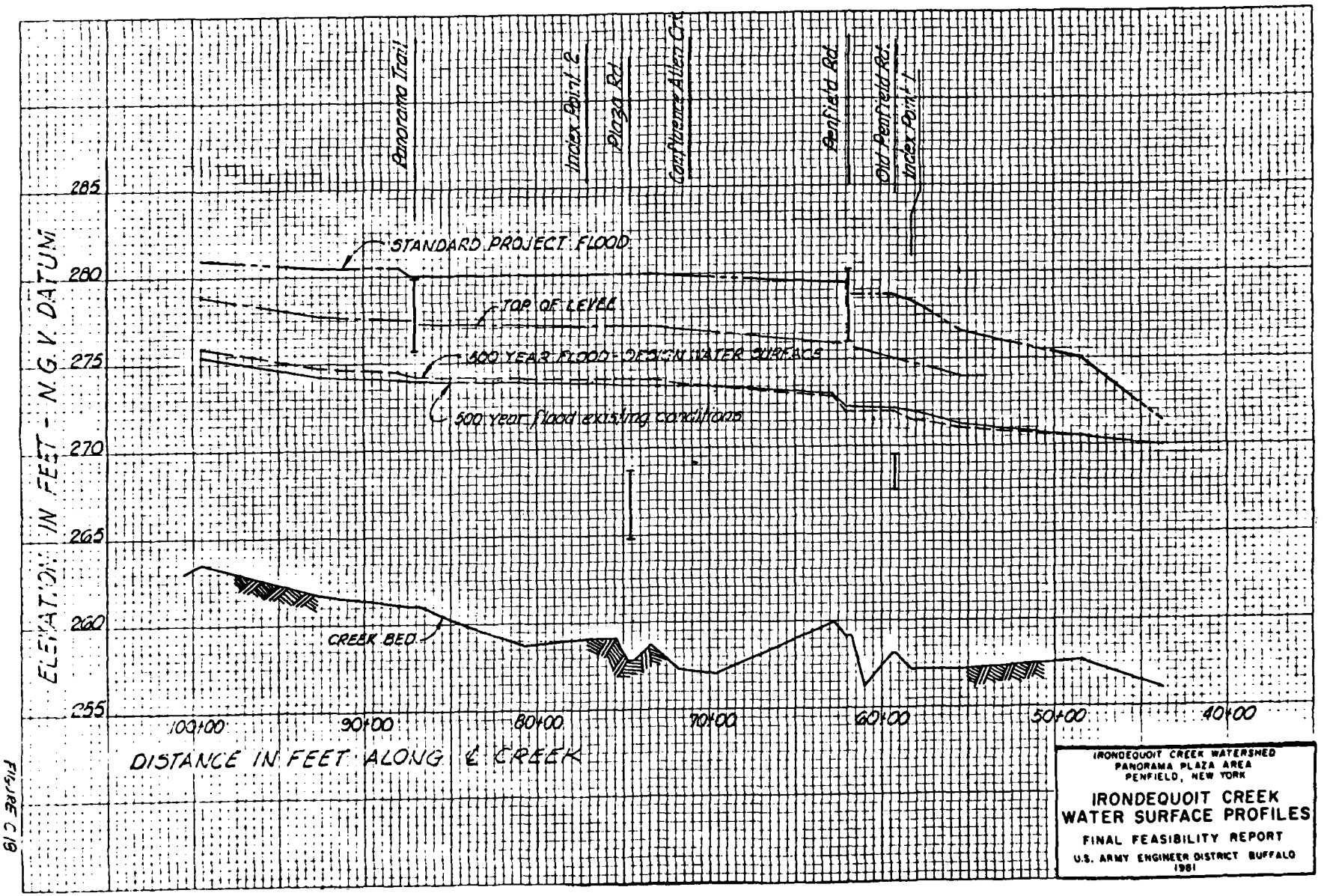
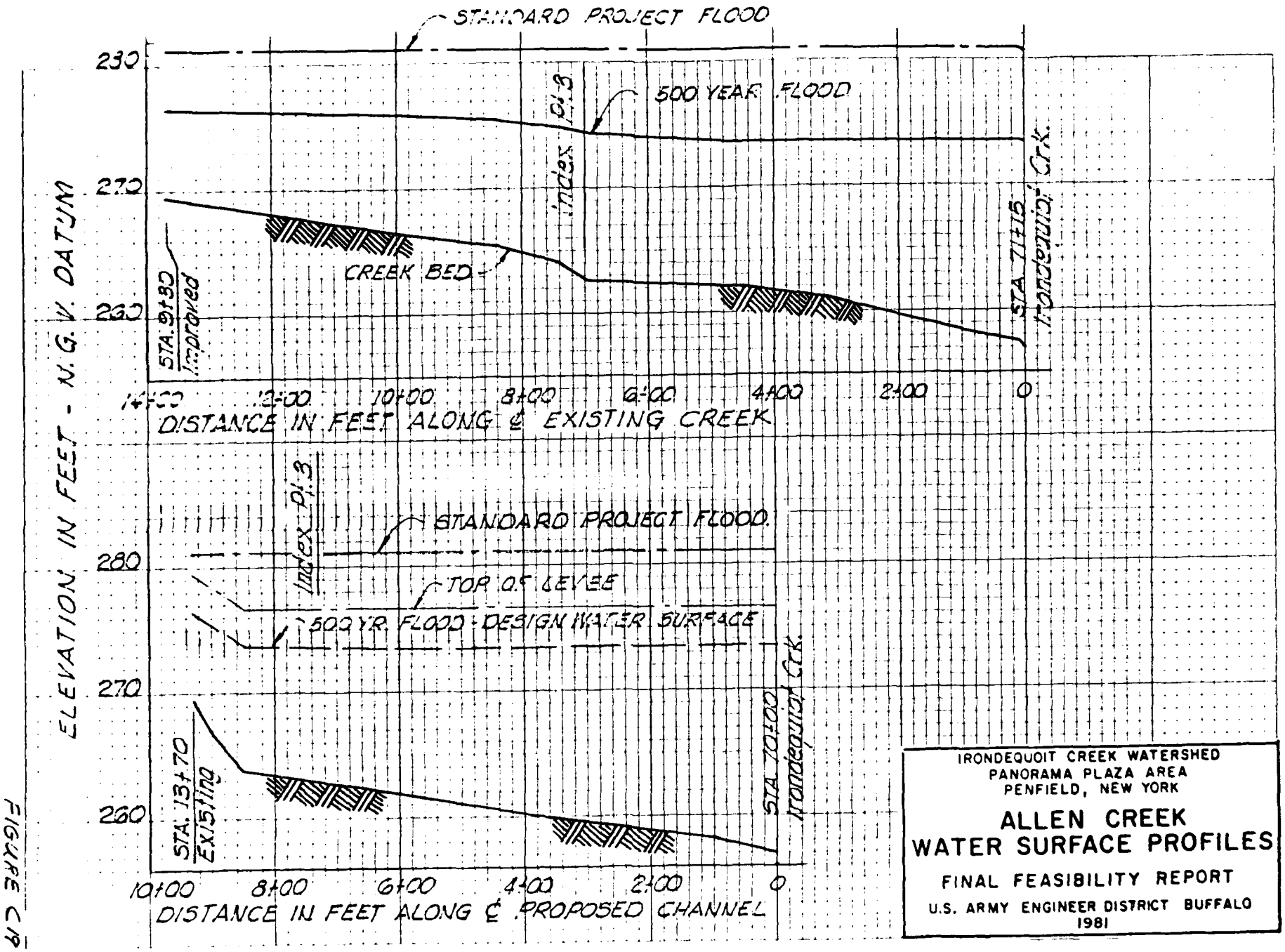

Panorama Trail
Index Point 2
Plaza Rd.
Confluence Allen Cr.
Penfield Rd.
Old Penfield Rd.
Index Point 1
STANDARD PROJECT FLOOD
TOP OF LEVEE
100 YEAR FLOOD - DESIGN WATER SURFACE
500 year flood existing conditions
CREEK BED
285
280
275
270
265
260
255
ELEVATION IN FEET - N.G.V. DATUM
100+00
90+00
80+00
70+00
60+00
50+00
40+00
DISTANCE IN FEET ALONG ℄ CREEK
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
IRONDEQUOIT CREEK
WATER SURFACE PROFILES
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C19



IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

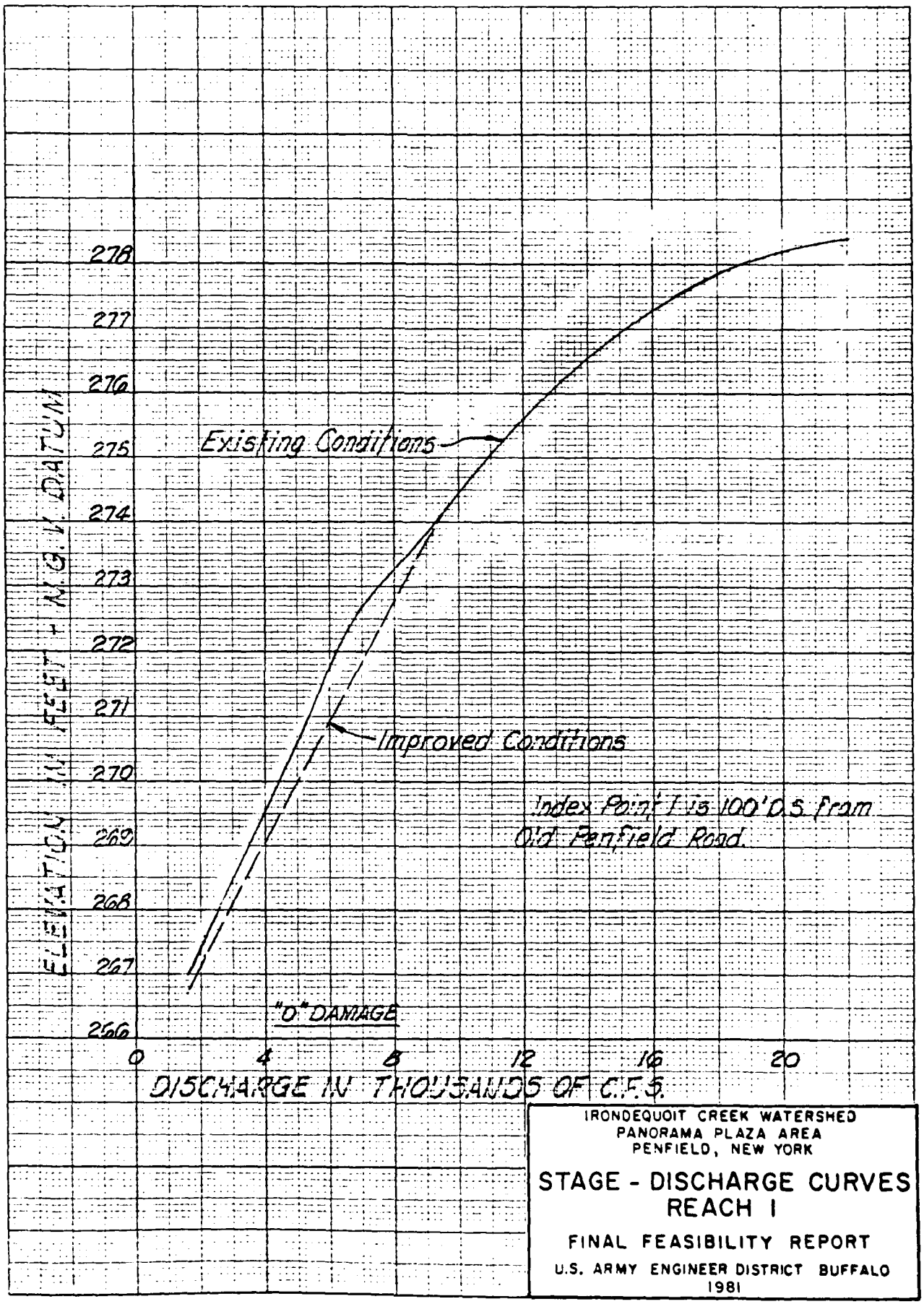
ALLEN CREEK WATER SURFACE PROFILES

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C-9

85-2



IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

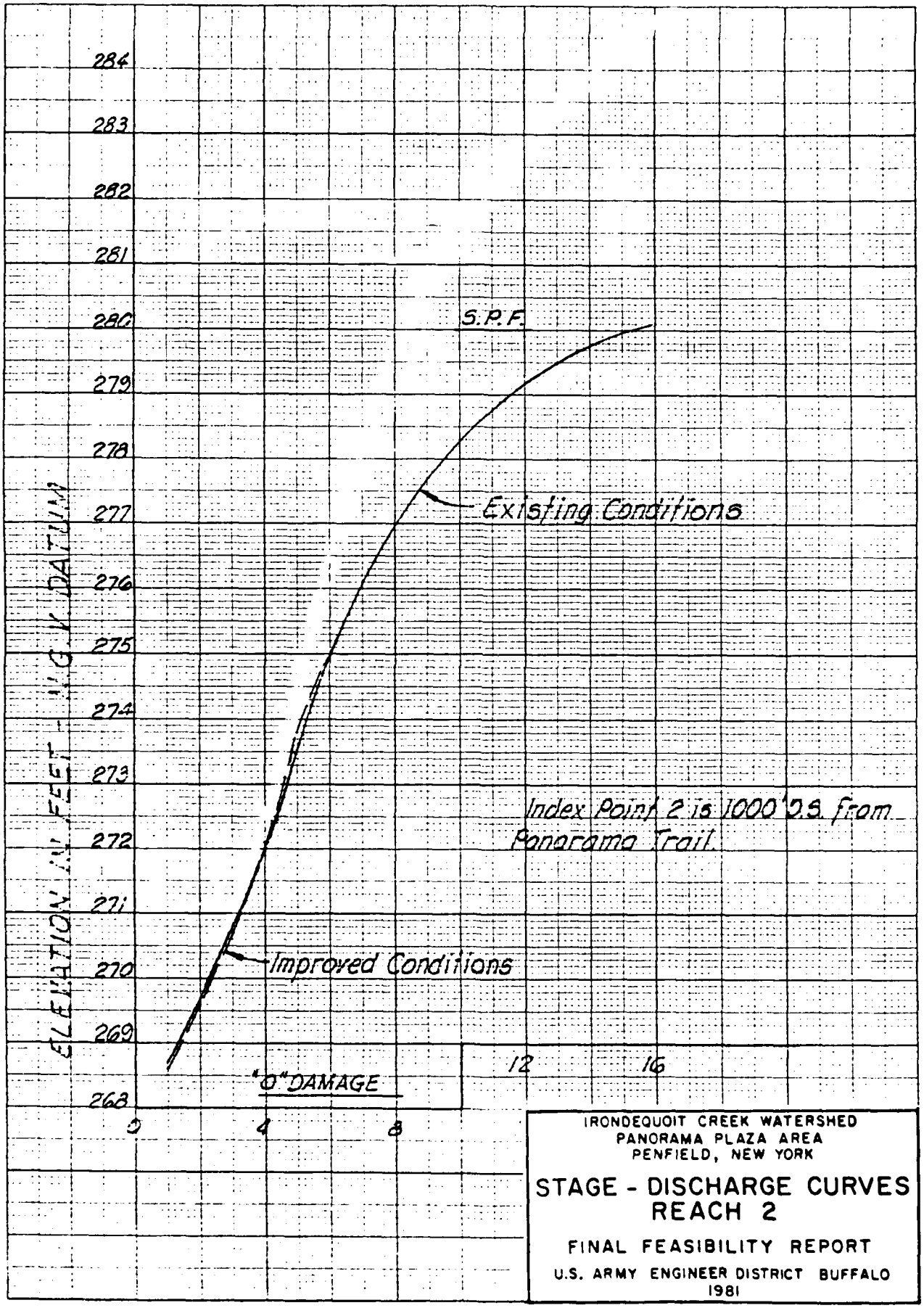
STAGE - DISCHARGE CURVES REACH I

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C 20

46 1240
K·E 20 X 20 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.



IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

STAGE - DISCHARGE CURVES REACH 2

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C21

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

STAGE - DISCHARGE CURVES REACH 3

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C22

46 1240
K·E 20 X 20 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO MADE IN U.S.A.

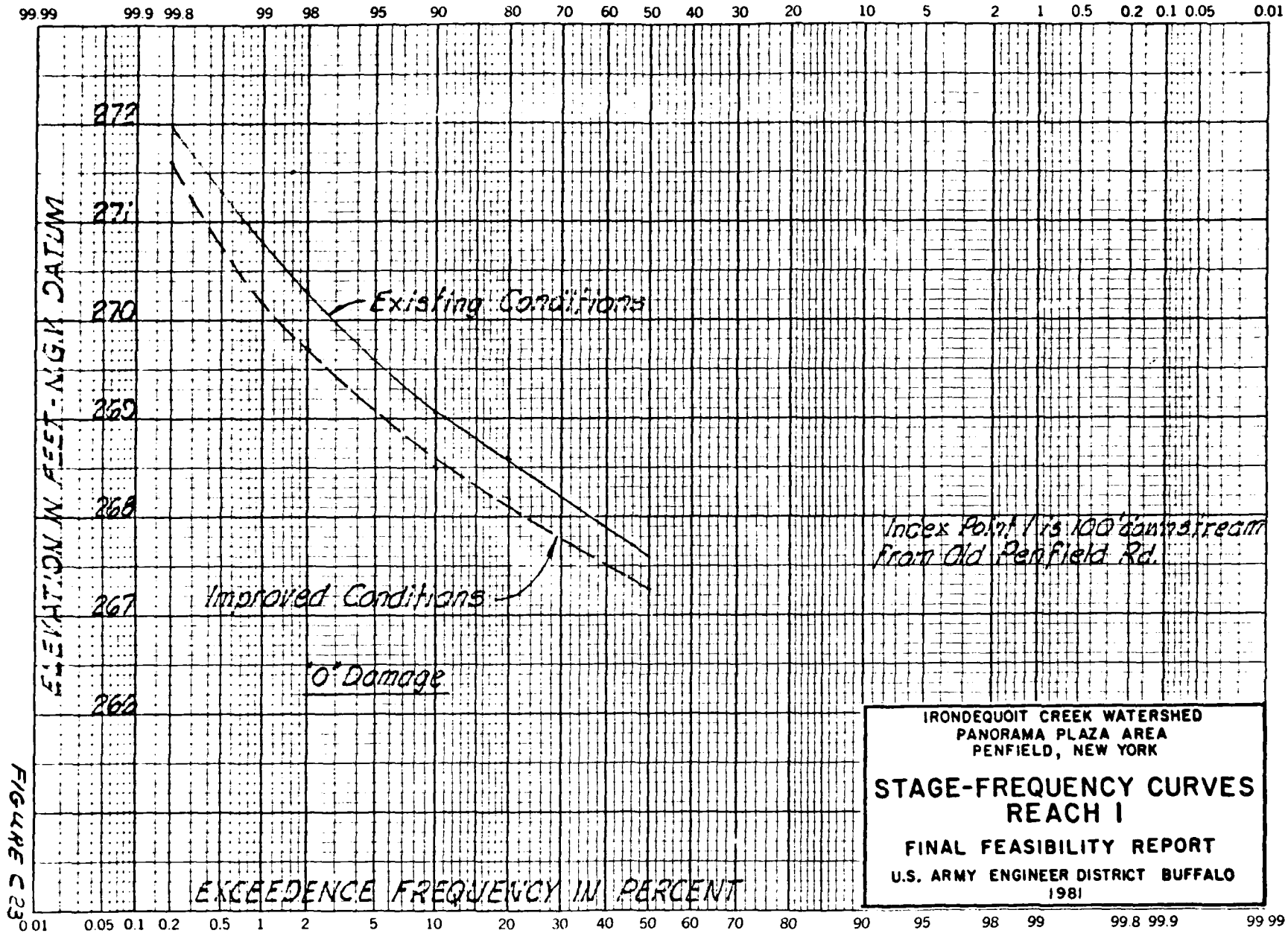
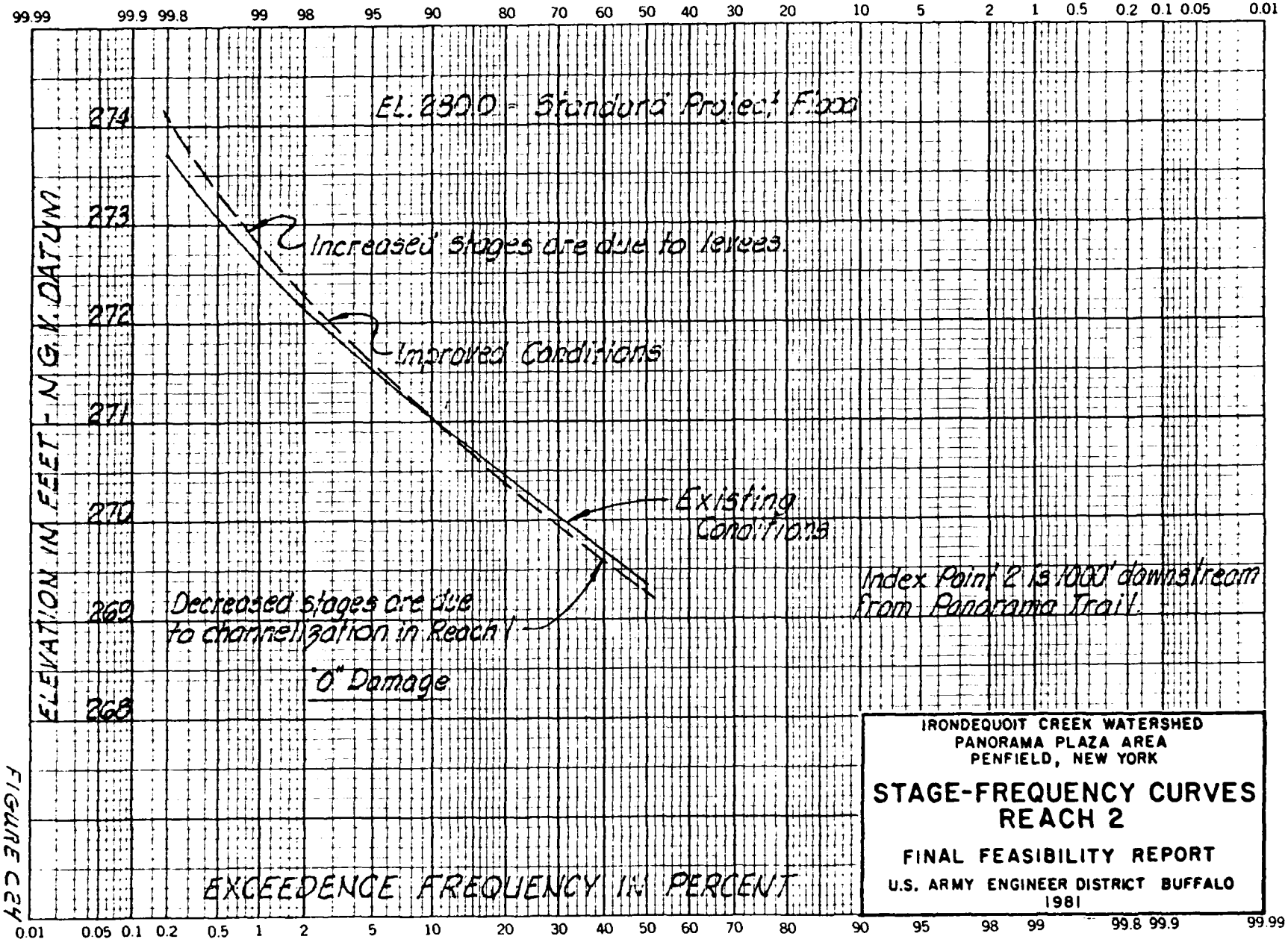

99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
ELEVATION IN FEET - NGH DATUM
272
271
270
269
268
267
266
Existing Conditions
Improved Conditions
0 Damage
Index Point 1 is 100' downstream from Old Penfield Rd.
EXCEEDENCE FREQUENCY IN PERCENT
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
STAGE-FREQUENCY CURVES
REACH I
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C 23

K·E PROBABILITY X 90 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.
46 8000



IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

STAGE-FREQUENCY CURVES REACH 2

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C27

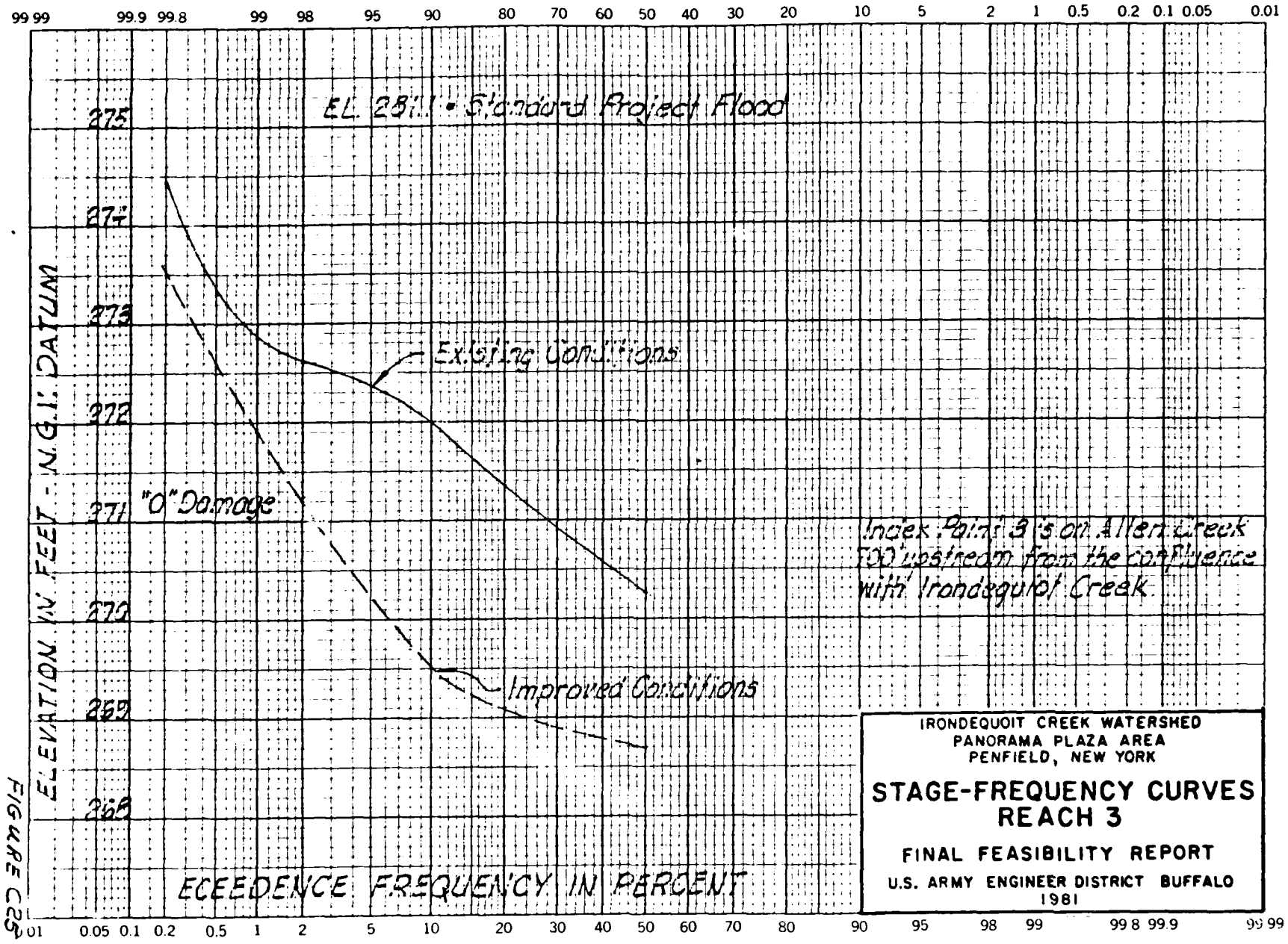
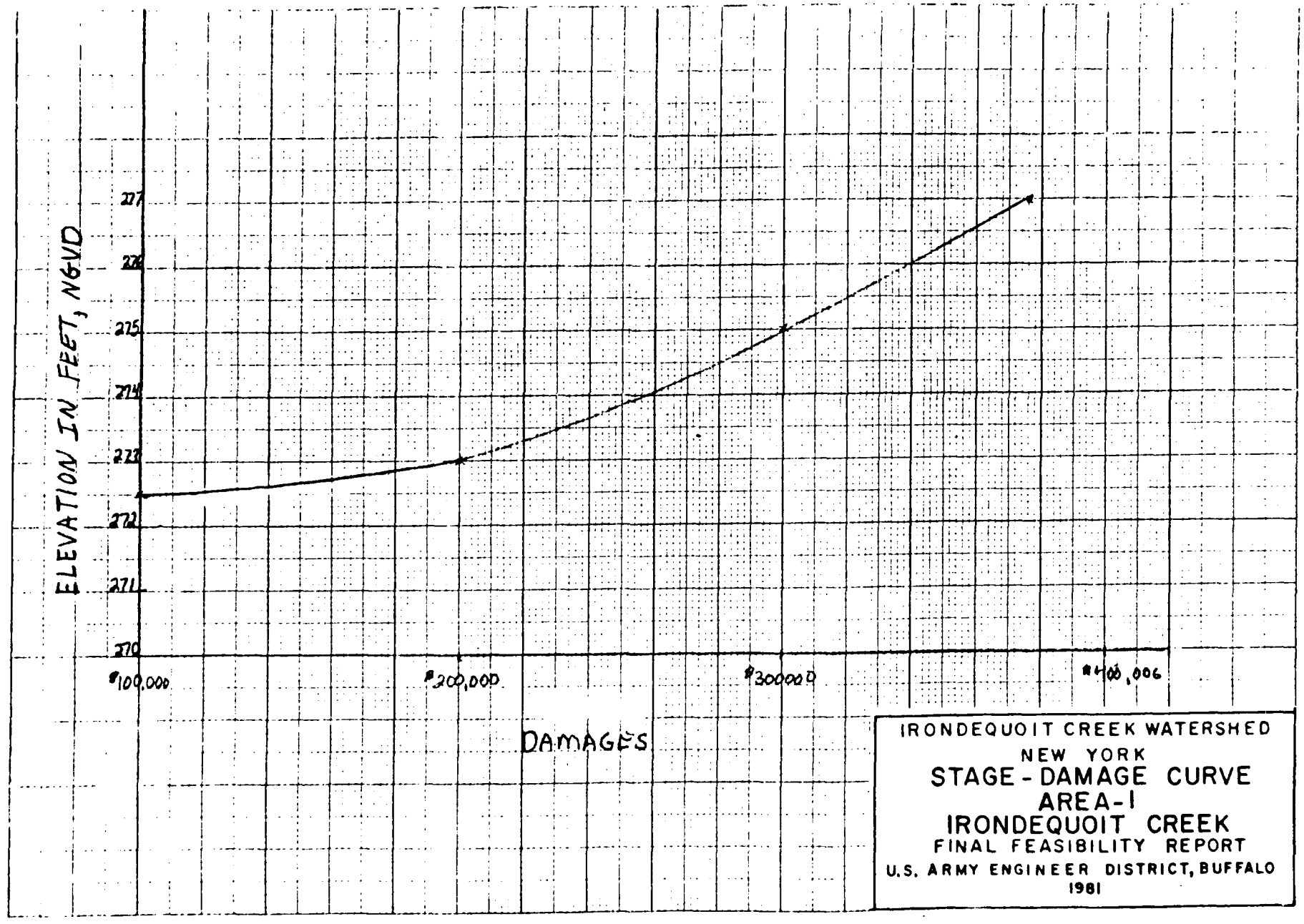

99 99
99.9
99.8
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1
0.5
0.2
0.1
0.05
0.01
EL. 281.1 • Standard Project Flood
Existing Conditions
"O" Damage
Improved Conditions
Index Point 3 is on Allen Creek 700' upstream from the confluence with Irondequoit Creek
275
274
273
272
271
270
269
268
ELEVATION IN FEET - N.G.V.D. DATUM
EXCEEDENCE FREQUENCY IN PERCENT
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
STAGE-FREQUENCY CURVES
REACH 3
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

FIGURE C25

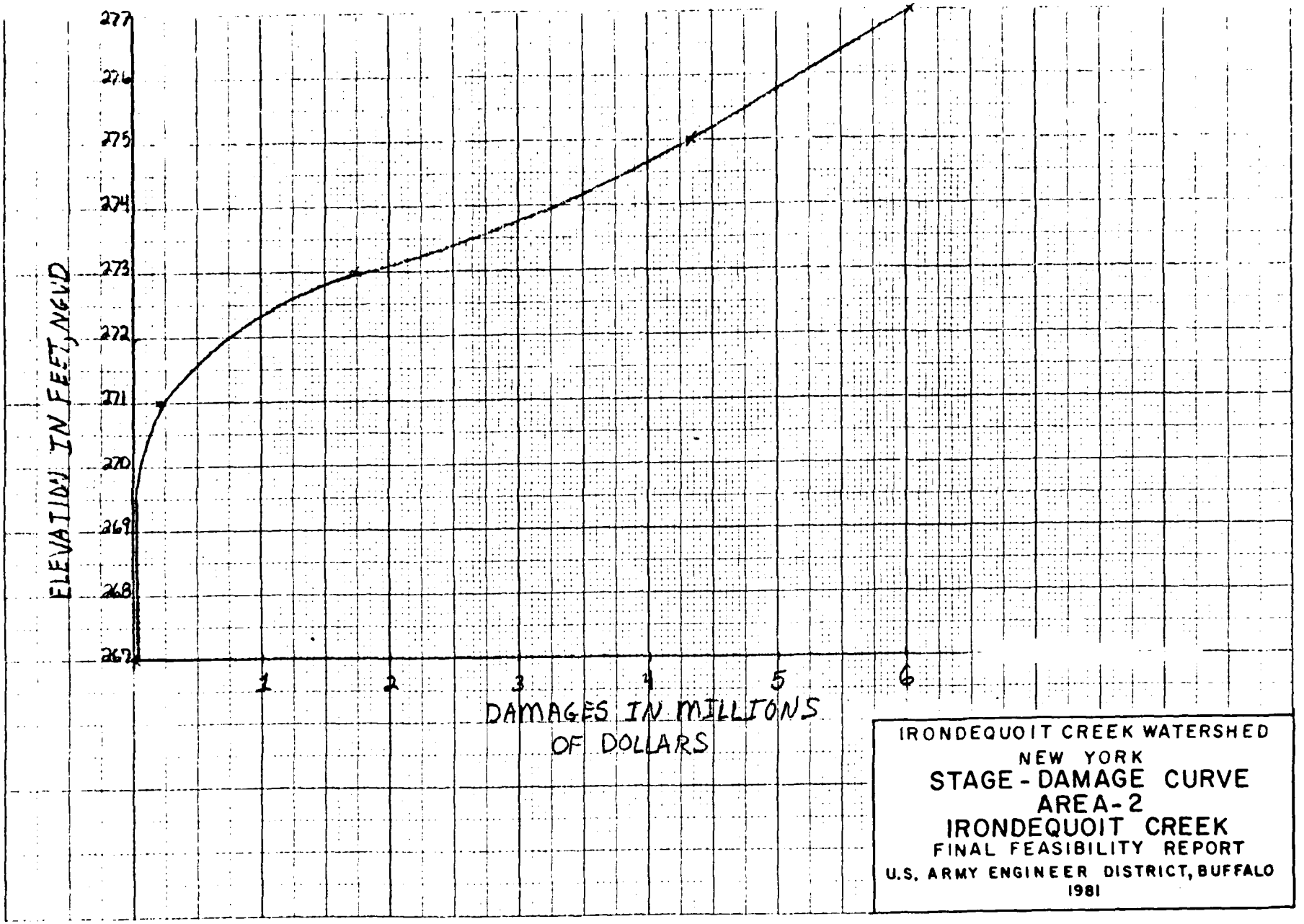
K&E 20 X 20 TO THE INCH
KEUFFEL & ESSER CO MADE IN U.S.A.



IRONDEQUOIT CREEK WATERSHED
NEW YORK
STAGE - DAMAGE CURVE
AREA-1
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

59-2

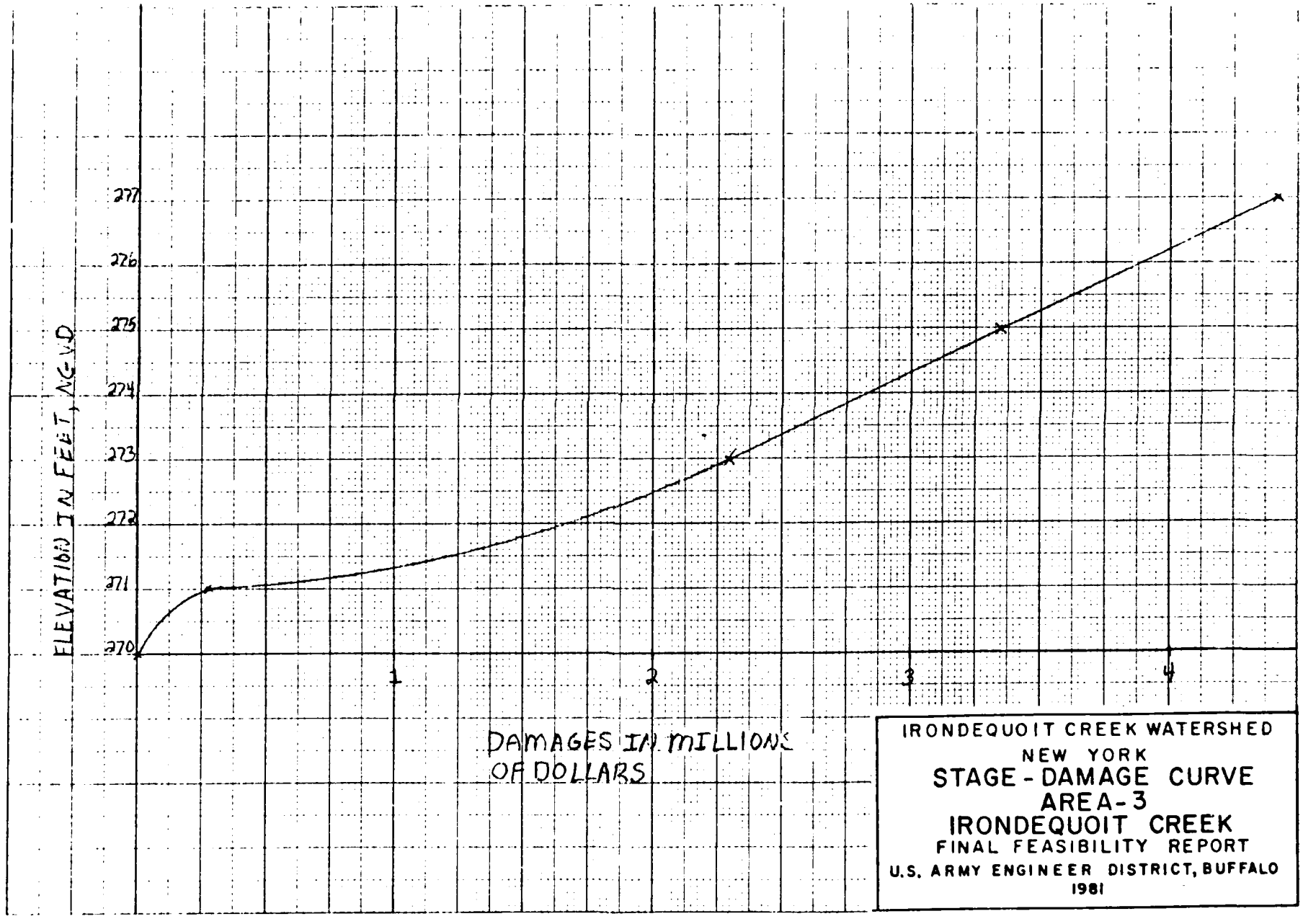
FIGURE C-6



IRONDEQUOIT CREEK WATERSHED
NEW YORK
STAGE - DAMAGE CURVE
AREA - 2
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C27

K&E 20 X 20 TO THE INCH
KEUFFEL & ESSER CO.
46 1240

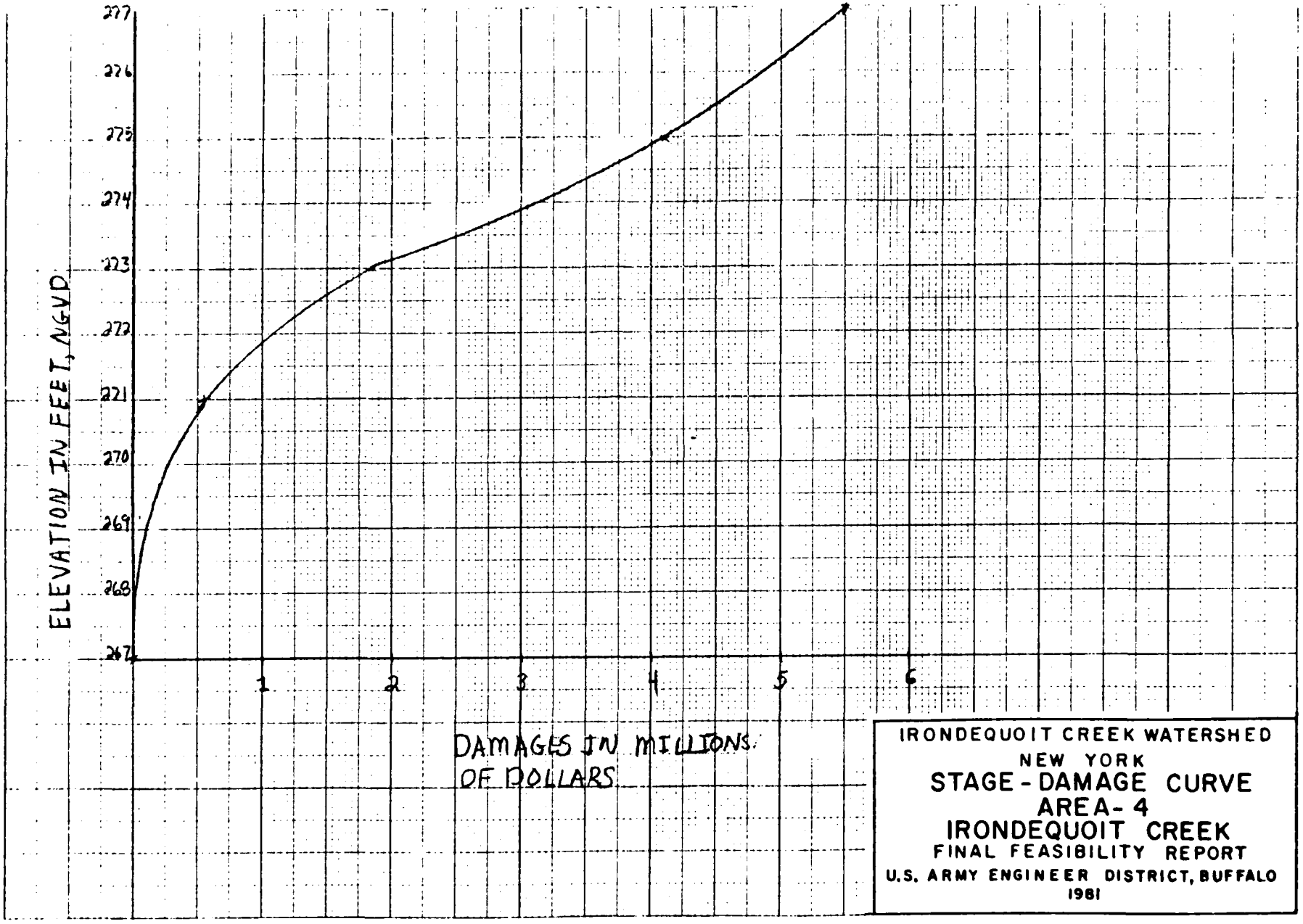


IRONDEQUOIT CREEK WATERSHED
NEW YORK
STAGE - DAMAGE CURVE
AREA - 3
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

C-67

FIGURE C-23

KEUFFEL & ESSER CO



IRONDEQUOIT CREEK WATERSHED
NEW YORK
STAGE - DAMAGE CURVE
AREA - 4
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C22

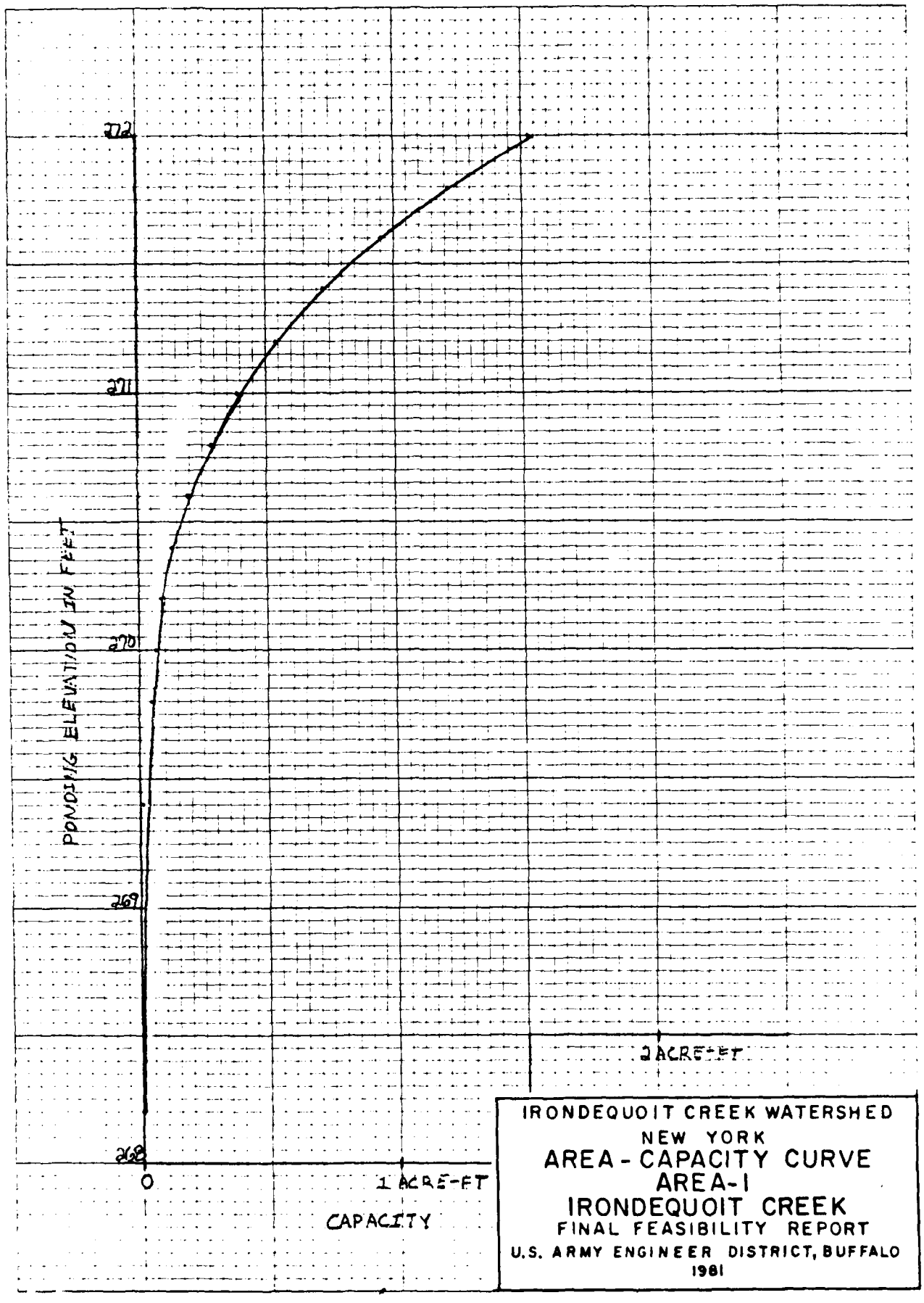
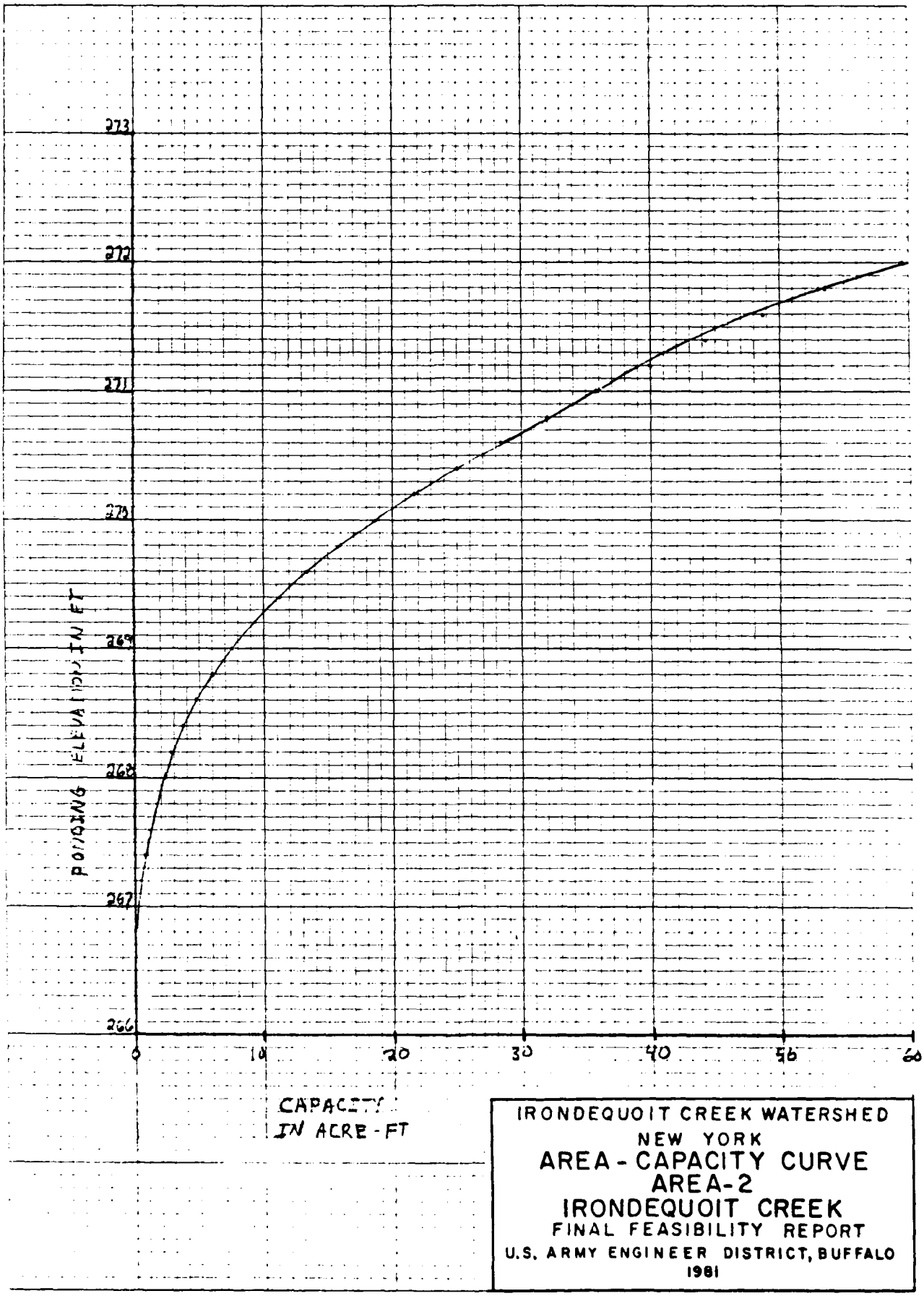

272
271
270
269
268
POOLING ELEVATION IN FEET
0
1 ACRE-FT
CAPACITY
2 ACRE-FT
IRONDEQUOIT CREEK WATERSHED
NEW YORK
AREA - CAPACITY CURVE
AREA-1
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C30

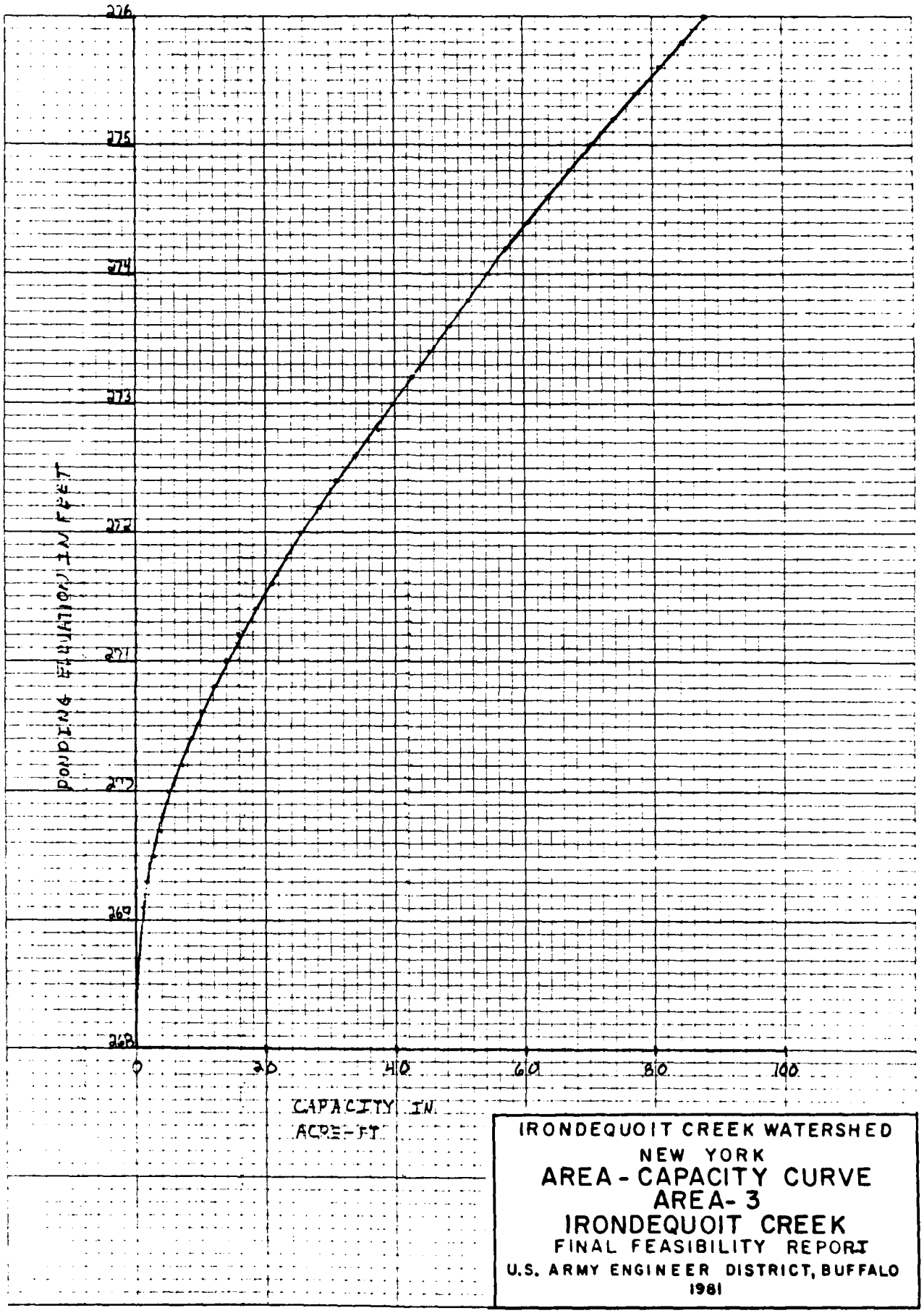


IRONDEQUOIT CREEK WATERSHED
NEW YORK
AREA - CAPACITY CURVE
AREA-2
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C31

KEUFFEL & ESSER CO MADE IN U.S.A.

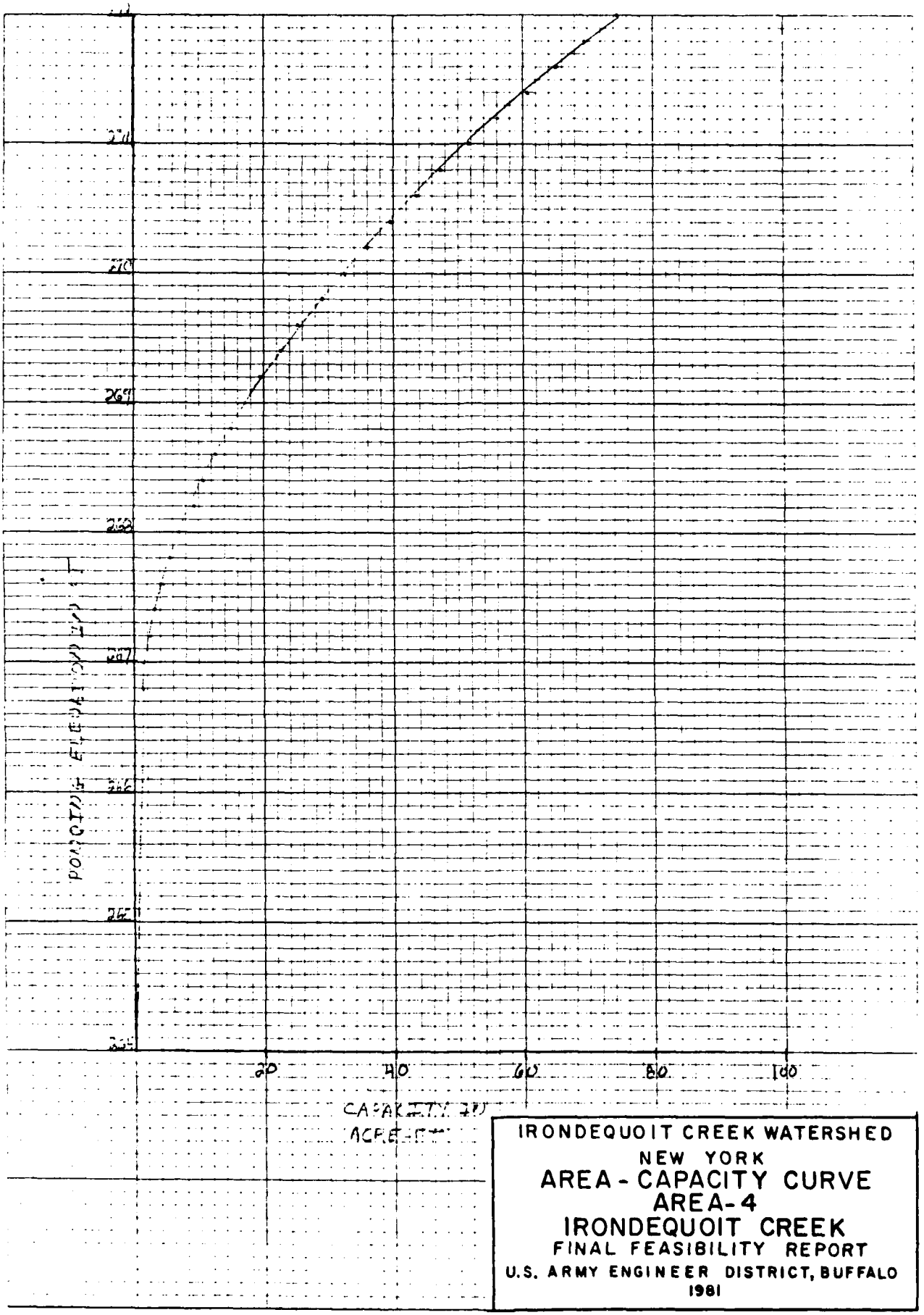
460700



IRONDEQUOIT CREEK WATERSHED
NEW YORK
AREA - CAPACITY CURVE
AREA - 3
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C32

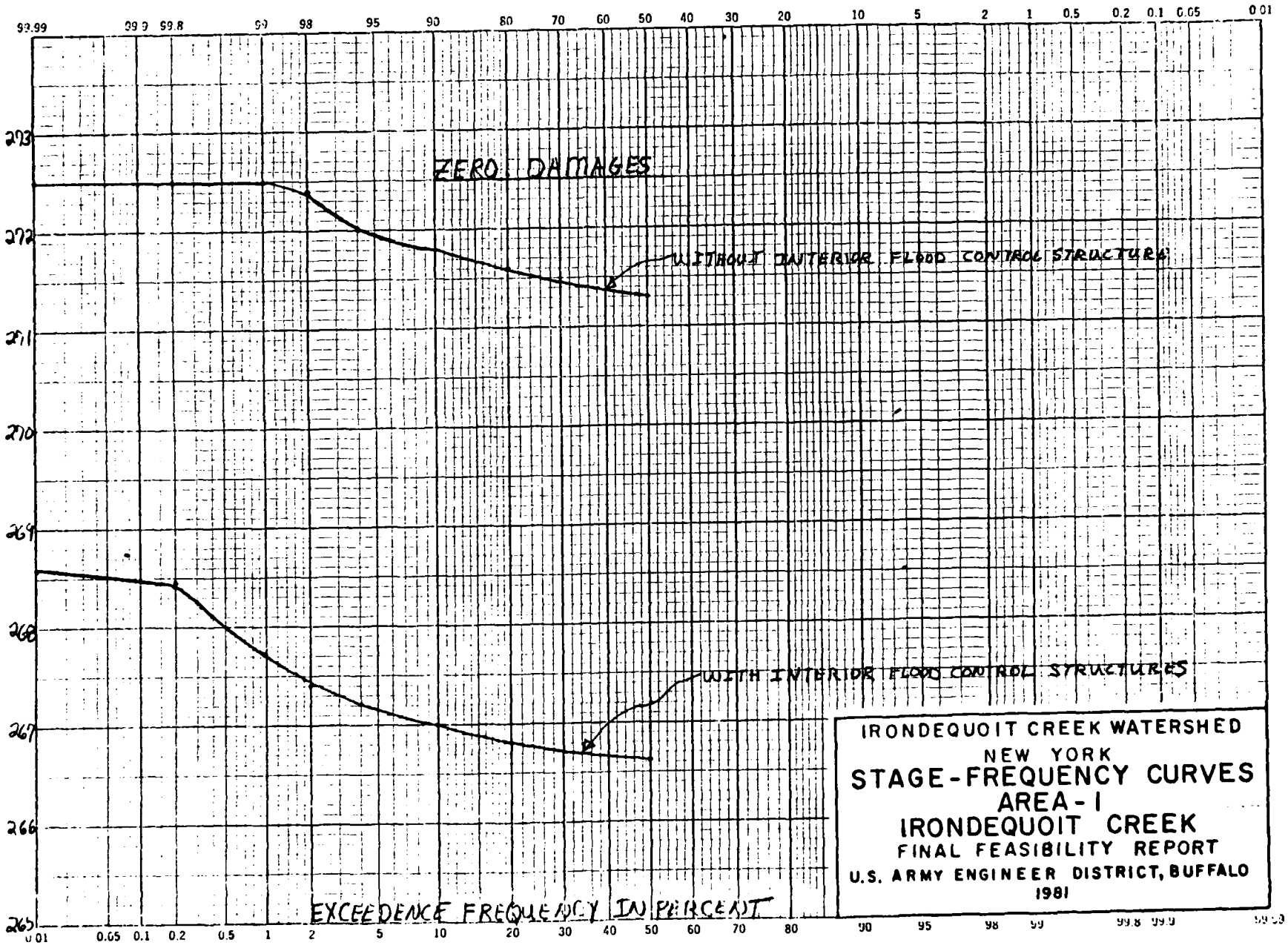
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.



IRONDEQUOIT CREEK WATERSHED
NEW YORK
AREA - CAPACITY CURVE
AREA-4
IRONDEQUOIT CREEK
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

FIGURE C33

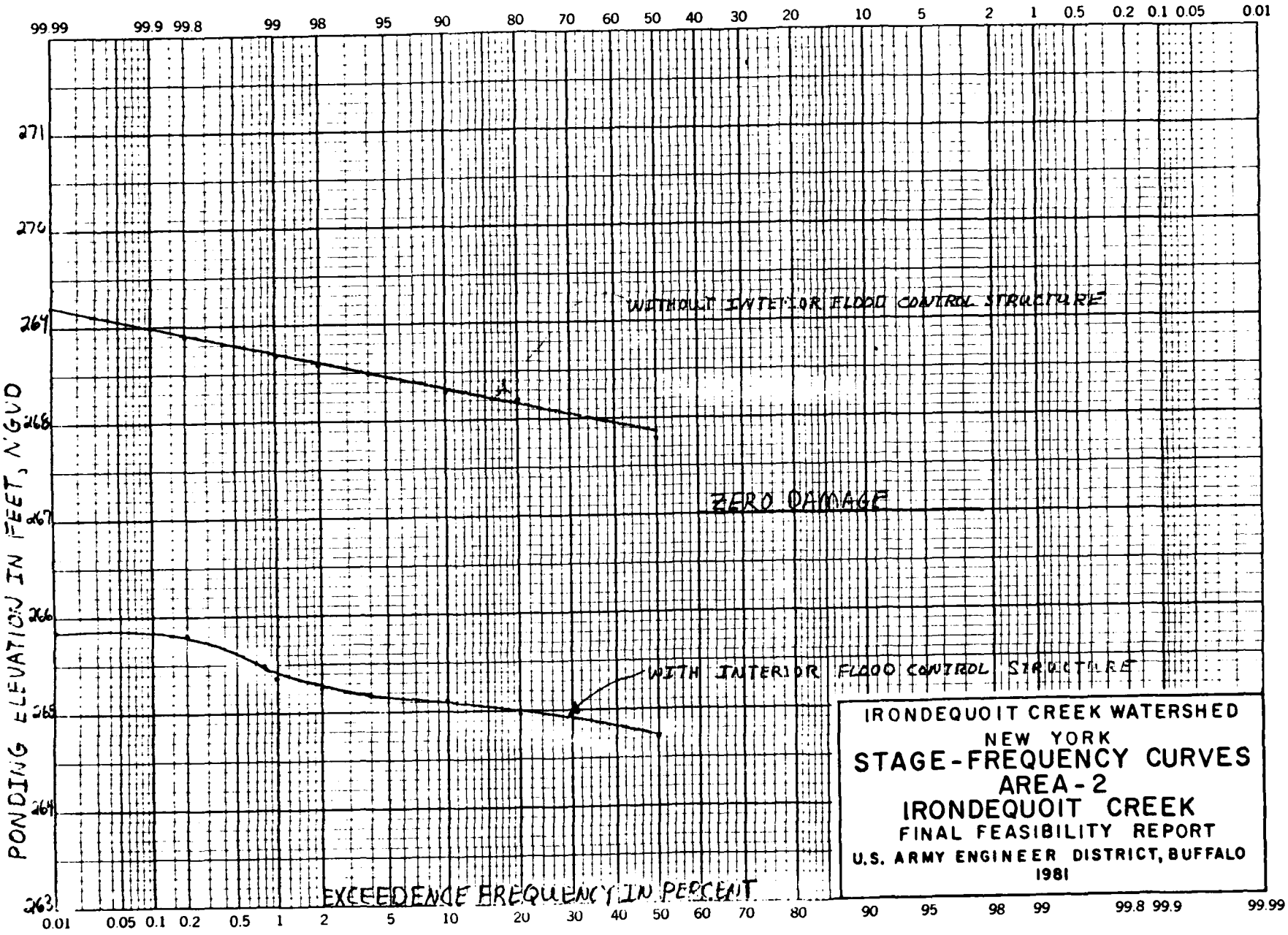
K&E PROBABILITY X 90 DIVISIONS 46 8000
KEUFFEL & ESSER CO.



C-73

FIGURE C34

K&E KEUFFEL & ESSER CO MADE IN U.S.A.



C-74

FIGURE C35

K&E PROBABILITY X 90 DIVISIONS
KEUFFEL & ESSER CO MADE IN U.S.A.
46 8000

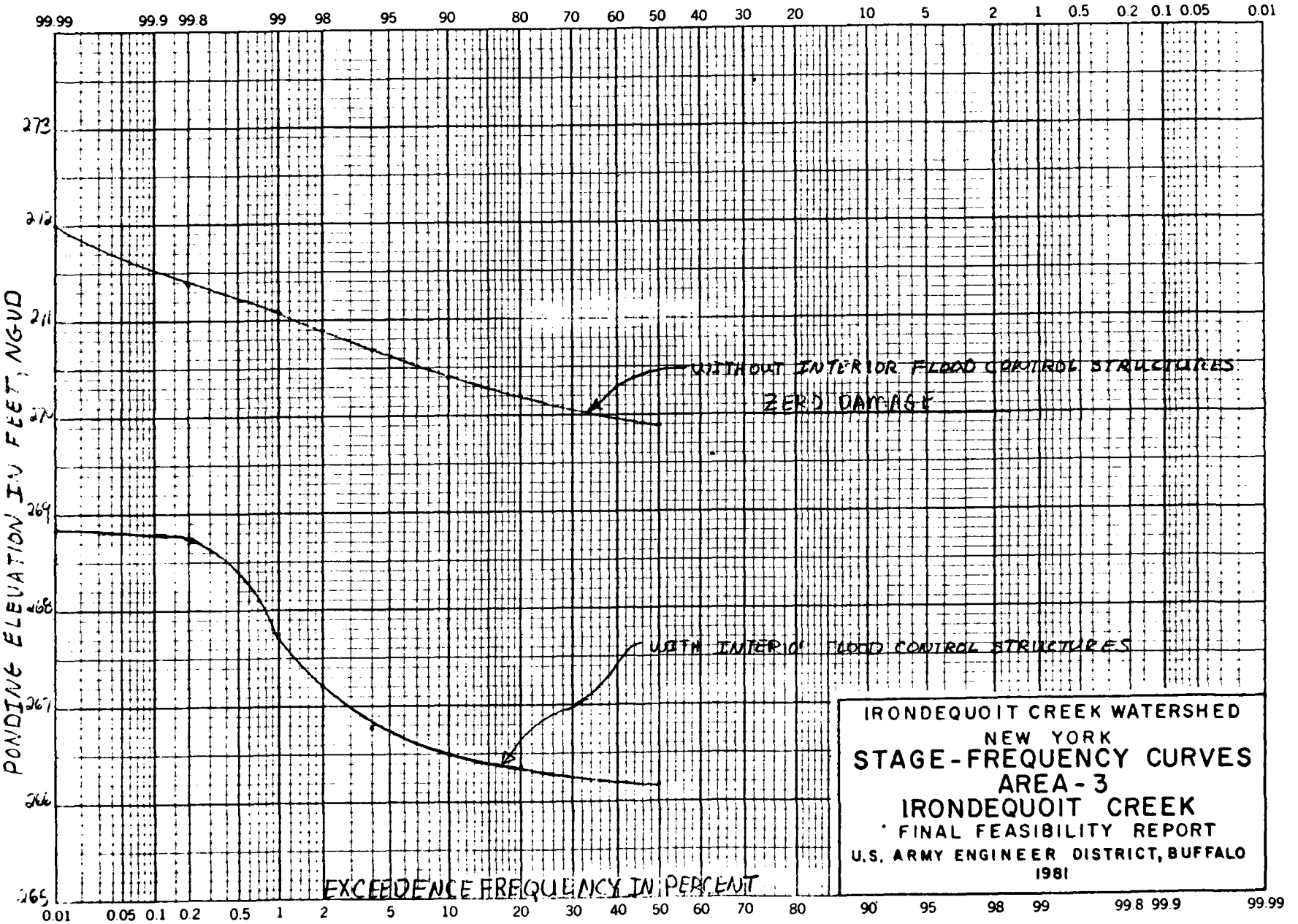
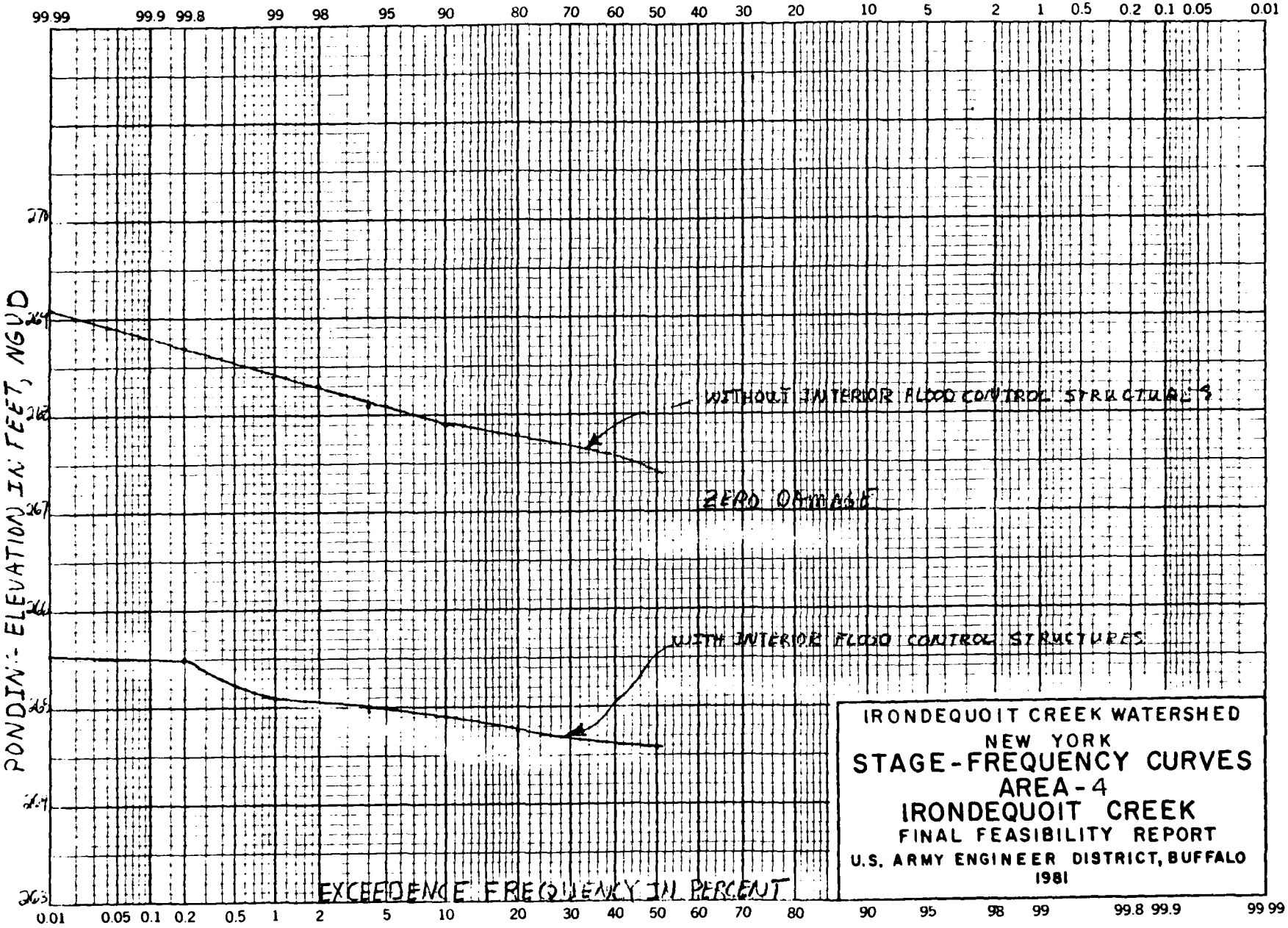


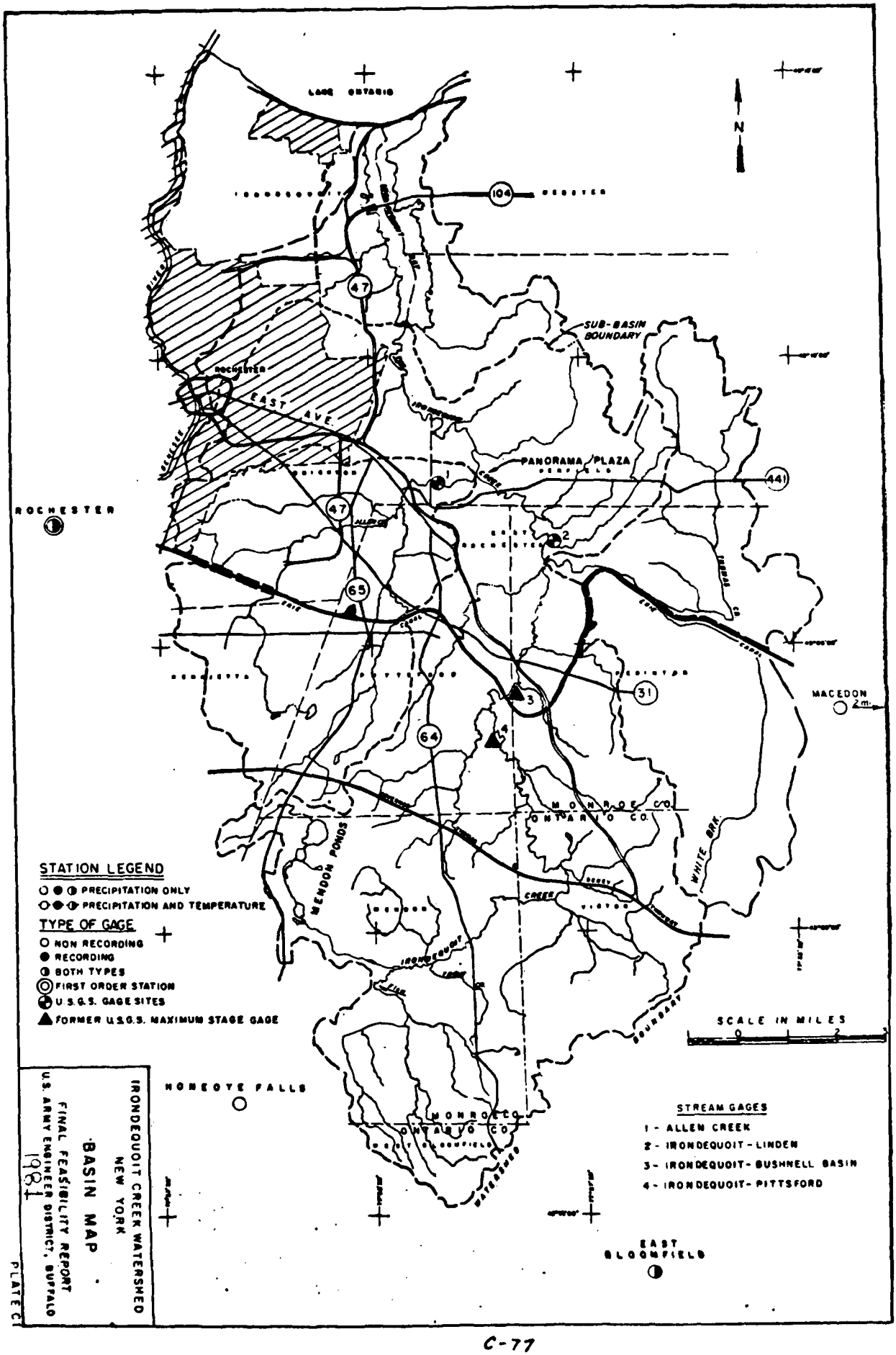
FIGURE C36

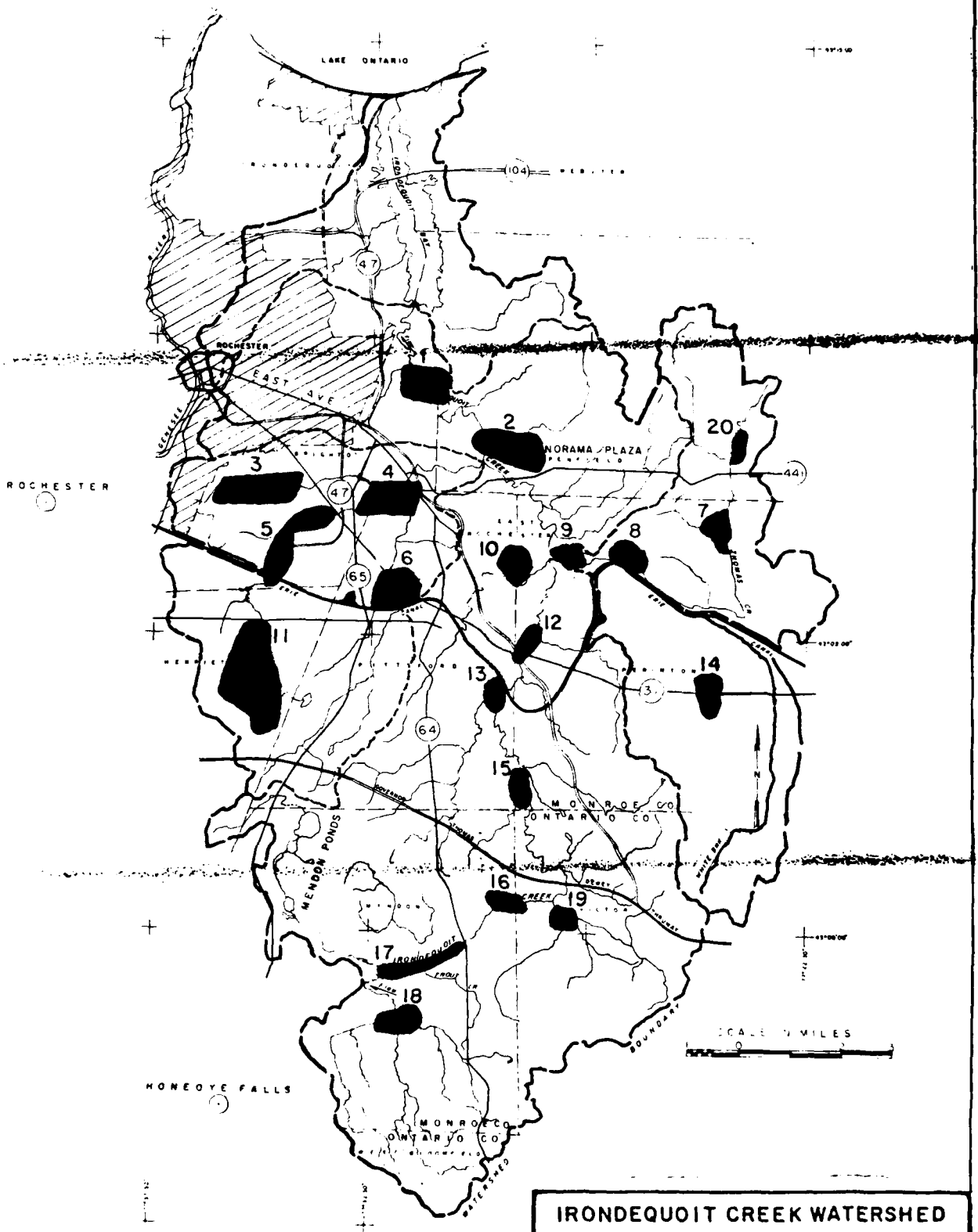
C-75



C-76

FIGURE C37

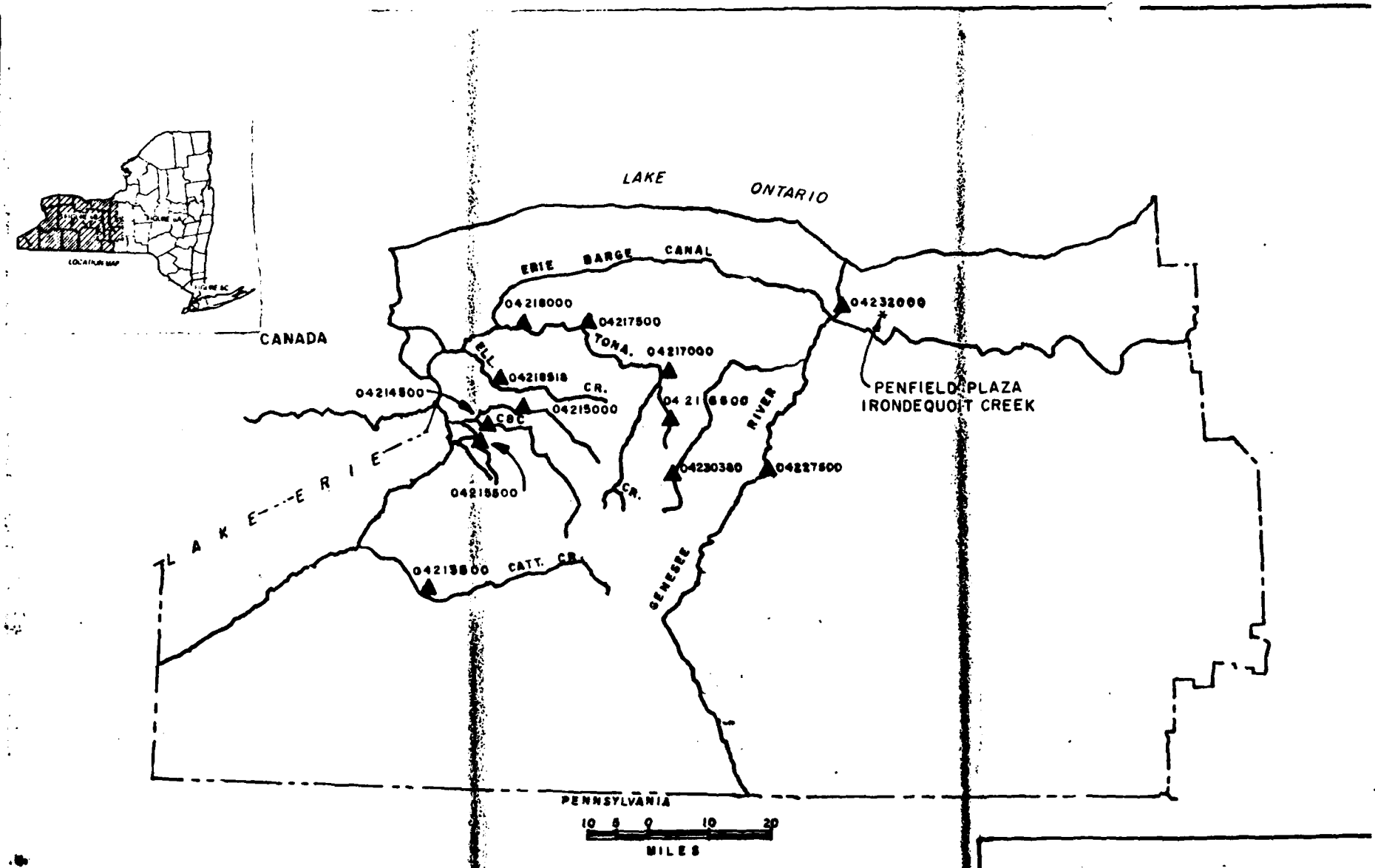

LAKE ONTARIO
N
104
47
SUB-BASIN BOUNDARY
ROCHESTER
EAST AVE.
PANORAMA PLAZA
441
47
ROCHESTER
65
2
31
MACEDON
2 mi.
64
3
MONROE CO.
ONTARIO CO.
MENDON PONDS
WHITE BRK.
CREEK
BOUNDARY
SCALE IN MILES
0
2
STATION LEGEND
PRECIPITATION ONLY
PRECIPITATION AND TEMPERATURE
TYPE OF GAGE
NON RECORDING
RECORDING
BOTH TYPES
FIRST ORDER STATION
U.S.G.S. GAGE SITES
FORMER U.S.G.S. MAXIMUM STAGE GAGE
HONEOYE FALLS
MONROE CO.
ONTARIO CO.
EAST BLOOMFIELD
STREAM GAGES
1 - ALLEN CREEK
2 - IRONDEQUOIT - LINDEN
3 - IRONDEQUOIT - BUSHNELL BASIN
4 - IRONDEQUOIT - PITTSFORD
IRONDEQUOIT CREEK WATERSHED
NEW YORK
BASIN MAP
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981
PLATE C1



IRONDEQUOIT CREEK WATERSHED
NEW YORK

DAMAGE AREAS

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO



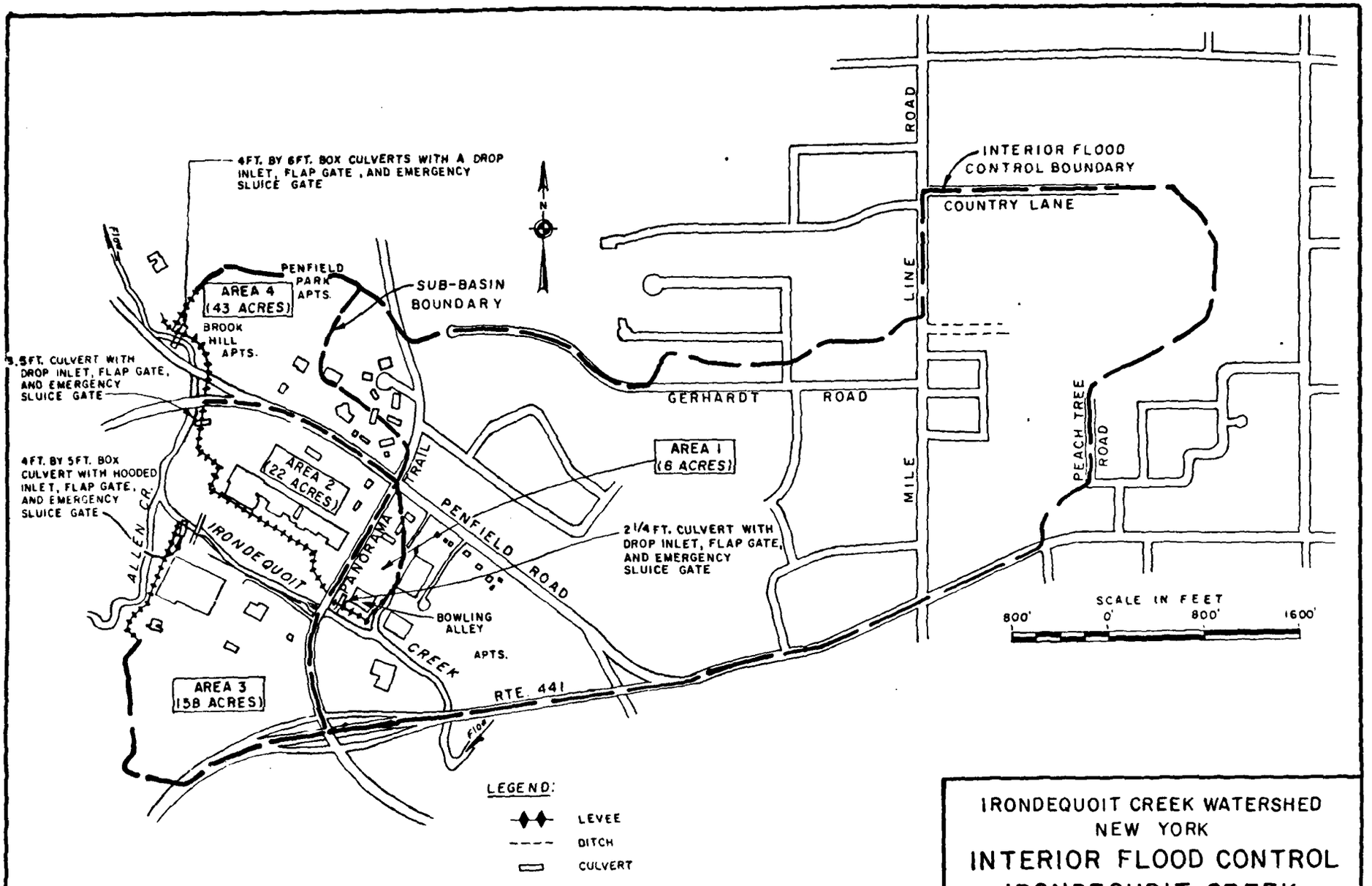
IRONDEQUOIT CREEK WATERSHED
NEW YORK
GAGES AROUND STUDY AREA
FINAL FEASIBILITY REPORT

US ARMY ENGINEER DISTRICT, BUFFALO

1981

C-79

PLATEC3



IRONDEQUOIT CREEK WATERSHED
NEW YORK

INTERIOR FLOOD CONTROL IRONDEQUOIT CREEK

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

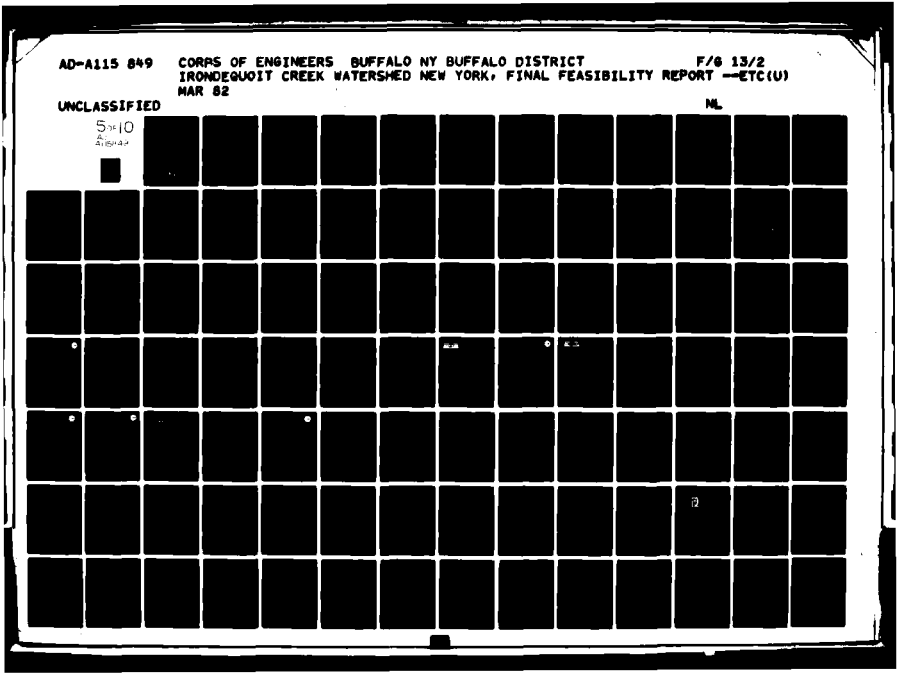
PLATE C-4

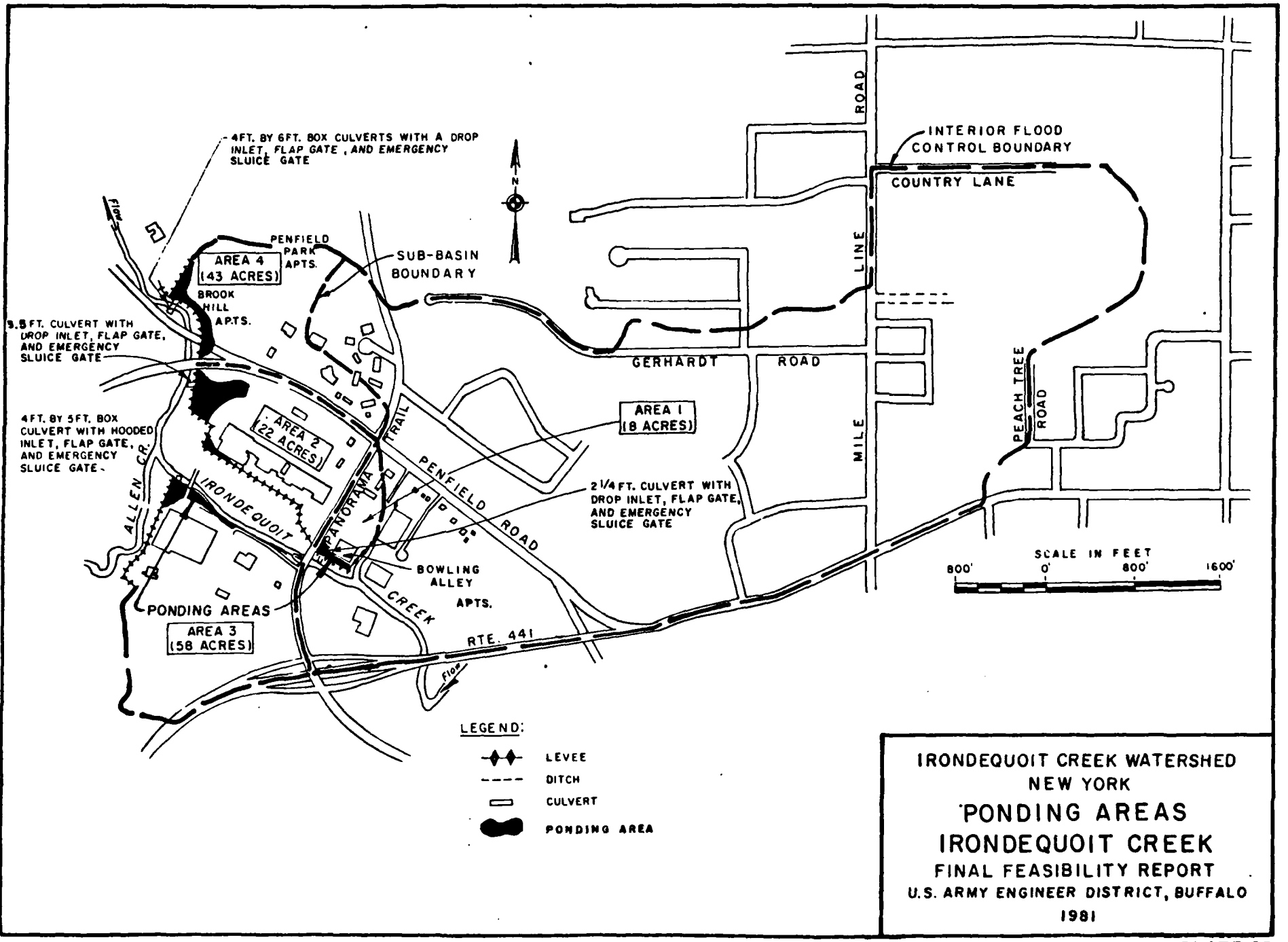
C-80

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL

5x10
A
AD-A115 849





IRONDEQUOIT CREEK WATERSHED
NEW YORK

PONDING AREAS IRONDEQUOIT CREEK

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO
1981

PLATE C5

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX D
DESIGN

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

APPENDIX D

DESIGN

TABLE OF CONTENTS

Paragraph	Description	Page
D1	Design	D-1
D1.1	General	D-1
D1.2	Extraordinary Factors Influencing Design	D-1
D1.3	Selected Design	D-1
D1.4	Degrees of Protection	D-2
D2	Project Features - 50-, 100-, and 500-Year Protection	D-2
D2.1	Levees	D-2
D2.2	Floodwalls	D-2
D2.3	Drop Structure on Allen Creek	D-2
D2.4	Gravity Outlets and Culverts	D-2
D2.5	Channelization	D-2
D2.6	Erosion Protection	D-3
D3	Improvement Locations - 50-, 100-, and 500-Year Protection	D-3
D3.1	Right Bank Upstream From Panorama Trail	D-3
D3.2	Left Bank Upstream From Panorama Trail	D-3
D3.3	Right Bank Panorama Trail to Penfield Road	D-3
D3.4	Left Bank Panorama Trail to Allen Creek	D-4
D3.5	Right Bank Penfield Road to Downstream Limit of Project	D-4
D3.6	Allen Creek	D-5
D4	Standard Project Flood	D-5

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX D
DESIGN

D1. DESIGN

D1.1 General

The alternatives for this project have been reduced to local flood protection by structural means. The objective of local flood protection is to contain the stream in an efficient, economic manner that is environmentally and socially acceptable. Hydraulic, structural, and geotechnical considerations influence the type and location of design features. Levees best satisfy this combination of criteria except where lack of space and costly relocation or reconstruction of existing improvements would be required. Only the left bank between Panorama Trail and the juncture with Allen Creek dictated a wall rather than a levee. The construction of levees and walls interrupts the natural flow of runoff to the stream which is considered as "internal drainage". Pumps, ponds, diversions, and gravity outlets accommodate the internal drainage.

D1.2 Extraordinary Factors Influencing Design

In addition to routine factors, environmental concerns and erodible soils influence the design significantly. Preservation of the existing channel and bank vegetation is highly desired and is possibly more important than flood control. This eliminated the traditional approach of an excavated trapezoidal channel with only grass permitted to grow in the geometric floodway. The highly erosive sandy soil is also a significant problem. The traditional engineering solution is to grade the channel banks and provide riprap or paving for protection where needed. Erosion protection would be costly and counterproductive to the environmental concerns.

D1.3 Selected Design

The creek and banks are left in their natural state wherever possible to minimize environmental disturbance. The erosion problem, as described in Appendix E - Geotechnical, is substantially avoided rather than solved by placing the levees back from the creek banks. This will allow natural erosion-deposition processes to continue with limited risk to the flood control structures. The hydraulic design held improved velocities at or near existing velocities, to minimize aggravation of erosion. The various features described below are the result of implementing this concept and accommodating localized circumstances. The 50-, 100-, and 500-year levels of protection are similar as described immediately following. Standard project flood features are addressed separately.

D1.4 Degrees of Protection

Four different degrees or levels of protection were considered. They are the 50-year, 100-year, 500-year, and Standard Project Flood (SPF). The first three were found to require similar types of structures with variations being essentially the elevation of the top of levee or wall. A simplified comparison is that the 100-year and 50-year water surfaces are about 1 foot and 1-1/2 foot, respectively, lower than the 500-year water surface. The SPF water surface is approximately 9 feet higher than the 500-year water surface. The improvements required for SPF protection are considered environmentally, socially, and economically unacceptable.

D2. PROJECT FEATURES - 50-, 100-, and 500-YEAR PROTECTION

D2.1 Levees

Levees are of conventional 10-foot top width, although some have a 23-foot top width. Sideslopes are 1 V on 2-1/2 H, which is the maximum slope that can be conveniently mowed. Clearing, grubbing, and stripping of topsoil to a width 5 feet beyond the levee toe will precede levee construction. Details of the inspection trench and levee materials are in Appendix E. Levees will be seeded, mulched, and fertilized to establish turf, except where erosion protection is required.

D2.2 Floodwalls

Floodwalls are planned to be "I" wall type consisting of concrete faced steel-sheet piling. The maximum height of wall is about 9 feet. This type wall was selected for economy and because of the limited space available between the creek and Panorama Creek Road. Excavation for an inverted T-wall would have impacted on the road or the creek bank.

D2.3 Drop Structure on Allen Creek

The 3-foot high drop structure will be constructed with steel-sheet piling. Piling will extend across the creek from the top of levee on the right bank, to the top of bank on the opposite side. Erosion protection will be provided upstream and downstream of the sheet piling.

D2.4 Gravity Outlets and Culverts

Gravity outlets will be constructed with reinforced concrete pipe. A headwall will be provided at the creek end of each outlet. Flapgates will prevent backup during high creek stages. Sluice gates located in a manhole, near the center line of the levee, will provide for emergency closure in the event of malfunction of the flapgate. Where ditches along the line of protection cross roads or driveways, corrugated metal pipe culverts with flared end sections or drop inlets will be provided as appropriate.

D2.5 Channelizaton

Channelization has been determined to be undesireable, primarily due to the adverse effect on fish. Excavation of channels in the sandy soils would

be difficult to maintain in the precise trapezoidal shape, without costly riprap or other forms of erosion control below normal water levels. Existing bank vegetation appears to maintain a fairly stable watercourse. There is little evidence of severe gouging of the banks or dumping or rubble to treat erosion. Channelization will only be used where riprap or other type of erosion protection is found necessary and on Allen Creek. Channelization sideslopes are 1 V on 2-1/2 H, comparable to levee sideslopes.

D2.6 Erosion Protection

Erosion protection will be provided upstream and downstream of bridges around headwalls, at gravity outlet channels to the creek and where high velocities would cause erosion. Riprap is a traditional solution, however, it is subject to vandalism. Social changes have contributed to increases in vandalism and pressures on local governments for other services suggest that public works improvements, of which erosion protection is a prime example, be constructed with high concern for maintenance. This presents a challenge to the designer to innovate and use new materials that are less vulnerable. Further consideration will be given for improved erosion protection in later stages of design. Appendix E provides details of present design.

D3. IMPROVEMENT LOCATIONS - 50-, 100-, and 500-YEAR PROTECTION

D3.1 Right Bank Upstream From Panorama Trail

A levee set back from the existing streambank protects the development at the lower elevations. This levee is tied back to high ground. A 4' X 4' drop inlet sized to utilize the capacity of a 27-inch diameter concrete pipe, extending through the levee provides for internal drainage. A sluice gate, accessible from the top of levee, headwall with flapgate, and grouted riprap channel to the creek will be provided on this gravity outlet. Some encroachment of parking and driveways occurs. Unused protected areas could replace part or all of the parking. The levee can be revised to a regrading of the driveways (with a paved surface) to the required elevations as necessary to maintain vehicular traffic.

D3.2 Left Bank Upstream From Panorama Trail

Existing ground elevations are at elevations that do not require structures to contain design flows.

D3.3 Right Bank Panorama Trail to Penfield Road

A levee set well back from the existing streambank protects the plaza area from adjacent design flood flows. The availability of space permitted the use of a low cost levee and provided a large floodway, which in turn helps to keep water velocities and attendant erosion lower. The proposed recreation area on the stream side of the levee is retained. A paved two-lane vehicular ramp, over the levee, is provided for maintenance of the flood control project. Access to the recreation area will be accommodated by this ramp also. Drainage along the inside of the levee will be provided by a

grass swail and culvert to a 7' X 7' drop inlet sized to utilize the capacity of a 42-inch diameter concrete pipe extending through the levee. A sluice gate accessible from the top of levee, headwall with flap gate, and grouted riprap channel to the creek will be provided on this gravity outlet.

A commercial building is located near Panorama Trail and is partially creekward of the end of the bridge wing wall. The feasibility of protecting this building was considered. Construction of a wall would be costly and not without risk of damage to the building. In addition to the wall erosion, protection would be needed to assure soil supporting the wall would not be lost. The resulting reduced section would raise channel velocity and create the need for erosion protection on the opposite bank. Costs, environmental impacts, and rewarding encroachment of the floodway made protection of this structure infeasible.

D3.4 Left Bank Panorama Trail to Allen Creek

A conventional steel-sheet pile "I" wall, with concrete encasement is required for this reach to protect the industrial and commercial area. Panorama Creek Road is too close to the creek to permit use of a levee. Relocation of the road and locating the road on top of a levee were considered, however, the additional space, disruption of traffic and access and costs made these alternatives infeasible. To provide pedestrian access from the left bank to the shopping plaza, two 6-foot wide swinging floodgates are proposed. Steel H piles will support fabricated steel gates hinged to close in the direction of streamflow. Internal drainage would be provided by a 8' X 8' drop inlet with a 4'X 5' box culvert, located near the confluence with Allen Creek.

D3.5 Right Bank Penfield Road to Downstream Limit of Project

A levee protects this area from Penfield Road to the tie in with high ground. Due to the close proximity of the apartment complex, the levee is adjacent to the creek. The right bank of the creek is graded and sloped continuing up the levee. A lack of tolerance for erosion which would threaten the levee and the higher velocity on the outside of the bend dictated provision of erosion protection from the Old Penfield Road Bridge to where the levee has a reasonable setback from the existing streambank. The access road to the Genesee Conservation League was placed on top of the levee, not only to save space, but there was no other place left without moving the creek or disrupting the apartment building parking. A two-lane access route would be built.

The Old Penfield Road will be blocked by the levee. Removal of the bridge is not necessary for hydraulic reasons. To avoid removal cost, the bridge remains in place.

Internal drainage for this area is accomplished by ditches a 15' X 15' drop inlet and a 4' X 6' foot reinforced concrete box culvert, extending through the levee. A sluice gate accessible from the top of the levee, headwall with flapgate, and a grouted riprap channel or reinforced concrete apron to the creek will be provided on this gravity outlet.

D3.6 Allen Creek

Protection along the right bank of Allen Creek is provided by a levee. The increased width of channel needed, high velocity flows, limited space between the creek, and the adjacent industrial building, and the lesser environmental concern resulted in, or permitted, a relocation of the about 900 feet of the creek to a trapezoidal riprapped channel. The right bank of the channel and the levee are a continuous slope. This portion of the creek being enlarged and channelized required a 3-foot high drop structure to prevent erosion upstream. A low flow channel will be provided in the drop structure as a shallow V notch to concentrate flow for fish migration. A low flow channel will also be provided in the channelized reach of the creek, however, this would be expected to occur by natural processes. Where it is possible the channel would meander along the existing alignment and shallow pools will be provided for improved fish habitat.

The upstream end of the levee ties into high ground. Two small wood frame buildings will be relocated. A small stream will be diverted along the creek side of the levee. The length of this small stream will be increased, which should avoid erosion problems associated with shortening streams. The left bank of Allen Creek will continue to overflow across undeveloped idle land.

D.4. STANDARD PROJECT FLOOD DESIGN

Protection for this magnitude of flood would severely impact on the existing improvements and the stream. Levee widths will increase by about 45 feet over those for the 500-year degree of protection. A levee and flood wall would be required between Route 441 and Panorama Trail on the left bank. For this same reach, on the right bank, a levee would be required farther upstream.

The Panorama Trail Bridge and the Penfield Road Bridge would each require 3-foot high curbs to force the flood flow under them. Structurally the bridges may not accept the lateral force of the water. Raising the bridges only to pass a flow that would occur once on an average in excess of 500 years is questionable.

The floodwalls would be a maximum of 17 feet high, which is beyond the limit of an I wall. An inverted T wall would be required, however, disturbing the existing bank would not be a problem, as erosion protection would be required throughout the limits of the project. Insomuch as the creek would be channelized it would be more sensible to relocate the channel between Panorama Trail and Penfield Road, to allow levees on both sides. Environmentally, channelization is considered unacceptable.

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX E
GEOTECHNICAL

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

IRONDEQUOIT CREEK

APPENDIX E

GEOTECHNICAL

TABLE OF CONTENTS

Paragraph	Description	Page
E1	REGIONAL GEOLOGY	E-1
E1.1	Physiography	E-1
E1.2	Surficial Geology	E-1
E1.3	Bedrock Geology	E-1
E1.4	Seismicity	E-2
E2	LOCAL GEOLOGY	E-2
E2.1	Surficial Geology	E-2
E2.2	Bedrock Geology	E-2
E3	FLUVIAL PROCESSES	E-3
E3.1	General	E-3
E3.2	Erosion and Sediment Sources	E-3
E4	GROUND WATER	E-3
E4.1	General	E-3
E5	SUBSURFACE EXPLORATIONS	E-3
E5.1	General	E-3
E5.2	Subsurface Investigations by NYSDOT	E-3
E5.3	Subsurface Investigations by Monroe County, Division of Pure Water	E-4
E5.4	Subsurface Investigations by the Buffalo District	E-6
E6	GEOTECHNICAL DESIGN	E-6
E6.1	General	E-6
E6.2	Channel Slope Design	E-6
E6.3	Levee Design	E-6
E6.4	Levee Loadings Over Irondequoit Creek Interceptor Sewer	E-6
E6.5	Floodwall Design	E-7
E6.6	Drop Structure - Allen Creek	E-7
E6.7	Riprap Design	E-7
E6.8	Materials Survey	E-7
E6.8.1	General	E-7
E6.8.2	Material Types and Gradations	E-8
E6.8.2.1	Design	E-8
E6.8.2.2	Type A Stone (18-inch Riprap)	E-8
E6.8.2.3	Type B Stone (Bedding Material)	E-8
E6.8.2.4	Type C Stone (Coarse Aggregate for Concrete)	E-8
E6.8.2.5	Type D Stone (Fine Aggregates for Concrete)	E-9

TABLE OF CONTENTS (Cont'd)

Paragraph	Description	Page
E6.8.3	Specific Gravity of Stone Materials	E-9
E6.8.4	Material Quality	E-9
E6.8.4.1	General	E-9
E6.8.4.2	Riprap and Bedding Stone	E-9
E6.8.4.3	Coarse and Fine Aggregates for Concrete	E-10
E6.8.5	Material Sources	E-10
E6.8.5.1	General	E-10
E6.8.5.2	Sources	E-10
E6.8.5.3	Type A Stone (18-inch Riprap)	E-10
E6.8.5.4	Type B Stone (Bedding Material)	E-10
E6.8.5.5	Type C Stone (Coarse Aggregate for Concrete)	E-10
E6.8.5.6	Type B Stone (Fine Aggregate for Concrete)	E-10
E7	CONSTRUCTION CONSIDERATIONS	E-10
E7.1	General	E-10
E7.2	Backfill for Inspection Trenches	E-11

TABLES

Number	Description	Page
E1	Subsurface Explorations, Boring Data	E-4
E2	Loading Factors	E-7

FIGURES

Number	Description	Page
E1	Physiographic Sketch Map	E-12
E2	Surficial Geology Map	E-13
E3	Seismic Risk Map	E-14
E4	Gradation Curves: Bedding	E-15
E5	Gradation Curves: 18-inch Riprap	E-16
E6	Gradation Curves: Coarse Aggregate for Concrete	E-17
E7	Gradation Curves: Fine Aggregate for Concrete	E-18

PLATES

Number	Description	Page
E1	Location Map - Subsurface Explorations	E-19
E2	Typical Cross Sections for Channel Slopes	E-20
E3	Typical I Wall (Floodwall)	E-21
E4	Location Map - Possible Material Sources	E-22
E5	Material Survey - Summary of Sources	E-23
E6	Material Sources	E-24

TABLE OF CONTENTS (Cont'd)

CALCULATIONS

Number	Description	Page
E1	Calculations for Riprap	E-25
E2	Calculations for Bedding/Filter	E-27

IRONDEQUOIT CREEK

APPENDIX E

GEOTECHNICAL

E1. REGIONAL GEOLOGY

E1.1 Physiography.

The Irondequoit Creek Watershed is located in Monroe, Ontario, and Wayne Counties in Central New York State. The stream drains the southeastern part of Monroe County and flows into Irondequoit Bay, which was the preglacial outlet of the Genesee River. The watershed drainage area is approximately 139 square miles. The length of the creek's main channel is approximately 32 miles. Its major tributaries are Allen Creek and Thomas Creek.

The project area is located in two physiographic provinces as shown in Figure E1: The Ontario Lake plain and the Southern Ontario plain of the Erie-Ontario lowland, the two being separated by the west trending Niagara escarpment. The Onondaga escarpment crosses the south central portion of the watershed.

E1.2 Surficial Geology.

The most prominent geologic features of the project are a result of Pleistocene glaciation, which began about 1 million years ago. As the ice receded, a series of short lived postglacial lakes formed and resulted in a thick layer of glacial drift that covered the sedimentary strata of Ordovician, Silurian, and Devonian age. (See Figure E2)

The soils of the watershed are derived from glacial lacustrine and fluvial deposits. They are deep, well-drained soils formed in lake deposits of silt and very fine sand.

E1.3 Bedrock Geology.

The sedimentary bedrock dips toward the south, approximately 60 feet per mile. The oldest bedrock formation is the Queenston Shale. This formation is red and relatively soft with harder greenish-gray layers. The age of the Queenston is upper Ordovician.

Overlying the Queenston Shale is the Medina Sandstone. The Medina Sandstone is a hard, red, fine to medium grained sandstone with some greenish-gray layers. The material was deposited during the middle Silurian.

The Clinton Group is above the Medina Sandstone. These formations consist of shale, shaly sandstone, and limestone. In this group, the formations range from the light gray-green of the Thorold Sandstone to the red of the Williamson Shale. The Rochester Shale marks the top of the Clinton Group. Overlying the Clinton Group is the hard, gray Lockport Dolostone.

Above the Lockport Dolostone are other shale or shaly formations. The first of these is the black Pittsford Shale, which is below the intermingling beds of the red Vernon Shale and the green Camillus Shale. At the top of this group is the Bertie Waterlime.

The youngest rock formation (Devonian) of the area is the Onondaga Limestone. This limestone is light gray with layers of hard, flinty chert.

E1.4 Seismicity.

The project area is located in Seismic Zone 3. The seismic risk map is shown on Figure E3. Zone 3 is a region susceptible to major damage by earthquakes.

E2. LOCAL GEOLOGY

E2.1 Surficial Geology.

The material that overlies the bedrock is of glacial, lacustrine, and fluvial origin. The glacial till covers much of the region and is composed of sand, silt clay, and boulders. Bordering the valley of Irondequoit Creek are thick desposits of sorted sand, silt, and gravel. These are the remnants of the ancestral Genesee River, which flowed into glacial Lake Iroquois, the Lake Ontario predecessor.

Gravel bars have been deposited in the steeper portion of the creek, and overbank deposits of fine sands (SP) are found in the lower portion of the stream.

E2.2 Bedrock Geology.

In the upper project area, the underlying bedrock is the Lockport Dolostone. This is a ridge forming feature with few exposures that is buried by glacial materials. The Clinton Group, the Medina Sandstone, and Queenston Shale are being eroded by Irondequoit Creek.

The Lockport Dolostone is predominantly dolomitic and characterized by brownish-gray to dark-gray, medium-granularity, medium to thick bedded with stylolites, carbonaceous partings, vugs, and poorly preserved fossils.

The thickness of the formation along the outcrop belt decreases in an easterly direction.

The Lockport has the following ascending members: the Decew is 12-15 feet thick and has been described as an olive-gray to brownish-gray, medium-grained siliceous dolostone; the Penfield member has a variable thickness of 52-62 feet. It is composed of crinoid fragments with a high percentge of quartz. The basal part is dolomite sandstone. Above the sandstone is a quartzose dolostone, which is medium dark-gray to dark brownish-gray with a thickness that ranges from thin-bedded to massive. The Oak Orchard member has a thickness of about 100 feet. This member is a brownish-gray to brownish-black with medium grained, saccharoical, medium to thick bedded dolostone.

E3. FLUVIAL PROCESSES

E3.1 General.

Irondequoit Creek is a warm water meandering stream of variable gradient. Where the creek downcuts through the Niagara escarpment, the gradient is relatively steep. At the flood plain, the steepness of the gradient decreases. The total drainage area to the mouth is 152 square miles. North of the Niagara escarpment, the stream cuts into the buried ancestral Genesee River Valley. The transported material ranges from fine sand to gravel.

The two major tributaries of Irondequoit Creek are Allen Creek and Thomas Creek. Allen Creek contributes coarse, grained material to the reach of the stream that is located between Highway 490 and Penfield Road.

E3.2 Erosion and Sediment Sources.

Irondequoit Creek drains portions of the Ontario Lake plain and Erie-Ontario lowland. The stream flows over the Niagara escarpment where the Lockport Formation provides one source of sediment. Alluvium along the channel banks is a source of fine sand. Erosion of kame terraces and outwash deposits in the buried Genesee Valley provide an additional source of sediment.

E4. GROUND WATER

E4.1 General.

The groundwater table generally follows the topography of the area. Bank overflow is a temporary groundwater recharge by the stream system. The bedrock surface is relatively impervious and consequently controls the leakage of groundwater to deeper areas. Ground water occurs in practically all the rocks in the project area, but only a few are acceptable sources of potable water. The water is relatively free of bacteria and suspended matter, and is uniform in chemical composition.

E5. SUBSURFACE EXPLORATIONS

E5.1 General.

Subsurface explorations within the general vicinity of the project have been performed by NYSDOT for the design and construction of road bridges, by Monroe County's Division of Pure Waters for the planning, design, and construction of Irondequoit Creek Interceptor Sewer System, and by the Buffalo District for this project. Intensive investigations for borrow material for the levee construction have not been performed. Levee alignments or channel banks have not been thoroughly drilled and sampled.

E5.2 Subsurface Investigations by NYSDOT.

Five bridges cross Irondequoit Creek within the project area. For the NYS Route 441 Bridge, NYSDOT drilled six borings using the Standard Penetration Test through the soils and diamond bits into bedrock. Subsurface data from

the other bridges have not been obtained. In general, the soil at the NYS Route 441 bridge was classified as sand and nonplastic silt. The minimum depth of bedrock was 58 feet (elevation 214.0 ±). Ground water elevation from those borings ranged from 258.9 to 263.9.

E5.3 Subsurface Investigations by Monroe County, Division of Pure Water.

For the planning, design, and construction of the Irondequoit Creek Interceptor Sewer, this agency contracted Rochester Drilling Co., Fact Technical Service, Inc., and Empire Soils Investigation, Inc., to perform drilling and sampling. Twenty borings were drilled and sampled using the Standard Penetration Test. The depth of the borings ranged from 10 feet to 41 feet. The materials sampled were classified as fine sand to a gravelly sand. The relative density varies from medium in the upper horizons to very dense with depth. Bedrock or cohesive materials were not encountered. Although these borings were not located within the exact limits of the project, they are parallel to both Irondequoit and Allen Creeks and are valuable in the determination of erodibility of soils. Borings are shown on Table E1 below and their locations are shown on Plate E1.

Table E1 - Subsurface Exploration, Boring Data

Borings [1] by NYSDOT at Route 441 Bridge			
Boring Number	Surface Elevation	Depth to Bedrock	Depth of Boring
DH 3-1	268.0	70.3	82.0
DH 3-2	276.3	80.9	90.9
DH 3-3	265.6	60.2	70.2
DH 3-4	273.5	76.65	83.4
DH 3-5	272.5	58.65	69.3
DH 3-6	268.5	60.1	70.1

Monroe County, Division of Pure Waters					
Station	Boring Number	Offset	Top Elevation	Depth	Bottom Elevation
99 + 16	12-3	190 L	278.1	16.5	261.6
94 + 08	12-2	55 L	269.5	21.5	248.0
79 + 50	12-1	133 L	266.7	26.5	240.2
72 + 64	B1-L	130 L	266.5	36.5	230.0
69 + 04	B - 50	200 L	266.9	31.5	235.4

Table E1 - Subsurface Exploration, Boring Data (Cont'd)

Station	Boring Number	Offset	Top Elevation	Depth	Bottom Elevation
Monroe County, Division of Pure Waters (Cont'd)					
62 + 68	B - 51	140 L	269.4	31.5	237.9
58 + 01	B - 52	115 L	265.9	28.5	237.4
56 + 55	TD - 2	52 L	266.2	41.5	224.7
52 + 65	B - 53	170 L	265.1	30.5	234.6
40 + 64	B - 54	360 L	268.4	35.0	233.4
37 + 33	B - 55	40 R	266.9	35.0	231.9
32 + 44	B - 56	35 R	265.4	31.5	233.9
28 + 08	B - 2L	90 L	270.0	31.5	238.5
26 + 63	B - 57	35 R	262.0	31.5	230.5
24 + 30	B - 72	162 R	262.0	75.6	185.5
Allen Creek					
305	1 - KOHL	100 L	270.5	16.5	254.0
505	2 - KOHL	45 R	270.6	15.0	255.6
885	3 - KOHL	30 R	273.0	16.5	256.5
	4 - KOHL		274.6	10.0	264.6
	5 - KOHL		277.5	13.0	264.5

1/ Borings were drilled using 2-inch OD X 1-3/8-inch ID X 20-inch long Standard Split Spoon and a 300 pound hammer with an 18-inch Free Fall.

E5.4 Subsurface Investigations by the Buffalo District.

To verify the information obtained from the above agencies, three hand auger borings were drilled and sampled. In addition, bank samples were taken for classification purposes. A mechanical analysis was performed on these samples, and the soil was classified as a fine sand. Thus, the concerns for erodibility of the stream banks was confirmed.

E5.5 Future Subsurface Investigations.

Future subsurface investigations along the alignment of the proposed structures will consist of continuous sampling using the Standard Penetration Test (1-3/8" ID x 2.0" OD and 3.0" ID x 3.5" OD standard split spoon samplers). Test pits will be dug if required. Ground water will be monitored by installing piezometers in selected reaches. The piezometers also will be used to assist in determining seepage potential. Proposed borrow areas will be sampled to determine the suitability for use in the construction of the earth embankment levees. Selected soil samples will be tested by the Ohio River Division Laboratories.

E6. GEOTECHNICAL DESIGN

E6.1 General.

Various factors required consideration for the selected locations of the floodwall, levees, and riprap. Prime consideration was given to available space, erosion potential, costs, and restrictions placed for the construction features by others.

E6.2 Channel Slope Design.

Channel slopes originally were designed for 3H on 1V for the channelization scheme. Channel velocities and the soil characteristics along with vegetation removal proved the scheme unfeasible. Therefore, slope stabilities and erodibilities must be considered for this project. For the selected plan, slopes will be 2.5H on 1V, and will receive 6 inches of graded bedding and 18 inches of graded riprap, and are discussed in Section E6.8. Riprap and bedding will be required in selected areas along the banks of both Allen and Irondequoit Creeks. Typical cross sections for channel slopes (and riprap placement) are shown on Plate E2.

E6.3 Levee Design.

Levees are designed to use a semipervious core having 1H on 1V side slopes and a covering of random materials shaped to a 2.5H on 1V slopes. An inspection trench will be excavated to a minimum of 6 feet below ground surface. The bottom width of the slope shall be a minimum of 4 feet to facilitate backfill equipment. Side slopes of the trench will be cut on 2H on 1V. Selected reaches of the levee will require riprap protection. Where velocities are high, the soil extremely susceptible to erosion, and where severe property damage could result should the levee be undercut, riprap will be placed to a minimum depth of 4.5 feet below the channel bottom. The riprap will be placed on the levee slope and shall be continued down the slope to

the required depth. Backfill to natural grade will be required. For a typical section through channel with levee, see Plate E2. For those levees designed adjacent to the streambed and its finished slope continues to the water, riprap also shall be placed to a minimum of 4.5 feet below the channel bottom. For this scheme, see Plate E2.

E6.4 Levee Loadings Over Irondequoit Creek Interceptor Sewer.

In general, the maximum height of the levees will be 10 feet. The levee will cross the Interceptor Sewer at several locations; therefore, loading of that sewer by the levee must be considered. Table E2 provides a tabulation of the sewer lines, their ultimate load capacity, and the load imposed from a 10-foot-high levee when the sewer line is 5 feet below ground surface.

Table E2 - Loading Factors

Sewer Diameter (inches)	Loading Capacity (pounds/feet)	Imposed Loading (pounds/feet)
42	1,350	1,057
54	1,350	1,057
84	2,000	1,057

E6.5 Floodwall Design.

The floodwall was selected for those areas in which space was not available to construct the levee. The erodible potential of the sand is such that the floodwall will be constructed on sheet pile. The sheet pile will be driven to a depth of 4.5 feet below the channel bottom to prevent channel scour from undercutting the sheet pile. For stability purposes, the sheet pile will be required to be driven an additional 5 to 6 feet. For the sheet pile and floodwall sections, see Plate E3.

E6.6 Drop Structure - Allen Creek.

To mitigate velocites and erosion on Allen Creek, a drop structure has been designed. For a distance of 20 feet downstream of this structure, 18-inch riprap will be placed in the channel bottom to a thickness of 27 inches. For a typical cross section of the drop structure, see Plate E3.

E6.7 Riprap Design.

Riprap for both Irondequoit and Allen Creeks will be 18-inches, and will be underlain by 6 inches of graded bedding. The fine sands and the velocities from the selected plan require that size material. Calculations for the design of both materials are shown on pages E-25, E-26, and E-27.

E6.8 Materials Survey.

E6.8.1 General.

A materials survey was performed in June 1980, to determine possible material sources for the construction of the Irondequoit Creek Flood Control Project. The survey consisted of a file search in which the following were considered: an analysis of the results of quarry investigations, an analysis of laboratory test results, the evaluation of available service records, and the determination of interest in producing required materials on the part of quarry/pit operators.

E6.8.2 Material Types and Gradations.

E6.8.2.1 Design - A preliminary design for a flood control project consisting of a concrete floodwall founded on sheet pile, earth levees, and channelization has been performed. Stone materials required to construct this project consists of bedding/filter stone, 18-inch riprap, and both fine and coarse aggregates for concrete. Stone materials may have an elongation ratio not greater than 3:1. All stones shall be predominantly angular in shape. Not more than 25 percent of the stones reasonably well distributed throughout the gradation shall have a length more than 2.5 times the breadth or thickness. They are described below.

E6.8.2.2 Type A Stone (18-inch Riprap) - This material will consist of a reasonably well-graded product having a minimum weight of 18 pounds and a maximum weight of 283 pounds as shown below and on Figure E5.

Eighteen-inch Riprap

Percent Lighter by Weight	Limits of Stone Weights in Pounds
100	283-113
50	84-57
15	42-18

E6.8.2.3 Type B Stone (Bedding Material) - This will be a reasonably well-graded product conforming to the gradation limits as shown below and on Figure E4.

Bedding/Filter Material

Seive Designation U. S. Standard Square Mesh	Percent Finer by Weight
6 inches	100
3 inches	95-100
1 inch	65-80
3/8 inch	35-55
No. 4	15-35
No. 10	0-10
No. 16	0-5

E6.8.2.4 Type C Stone (Coarse Aggregates for Concrete) - Coarse aggregates for concrete will consist of a suitable blend of NYSDOT sizes of No. 1 and No. 2. That blend shall fall within the limits shown below and on Figure E6.

Coarse Aggregate for Concrete

Sieve Designation U. S. Standard Square Mesh (inches)	Percent Finer by Weight
1-1/2	100
1	93-100
1/2	27-58
1/4	0-8

E6.8.2.5 Type D Stone (Fine Aggregate for Concrete) - Fine aggregate for concrete will consist of a reasonably well-graded material that complies with the NYSDOT grading requirements and within the limits shown below and on Figure E7.

Fine Aggregate for Concrete

Sieve Designation U. S. Standard Square Mesh	Percent Finer by Weight
3/8-inch	100
No. 4	90-100
No. 8	75-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	1-10
No. 200 (wet)	0-3

E6.8.3 Specific Gravity of Stone Materials.

A specific gravity of 2.56 (160 pcf) was used to compute the stone sizes for the three stone types. A variation in specific gravity equal to $\pm$ 5 percent (2.43 to 2.69) is acceptable.

E6.8.4 Material Quality.

E6.8.4.1 General - Quality requirements for each material type are discussed below. Riprap and bedding stone and aggregates for concrete have been subjected to the tests established by the Ohio River Division Laboratories, Cincinnati, Ohio. Test No. P-11, "Riprap and Breakwater Stone Evaluation" includes a suite of tests to determine stone durability. Coarse and fine aggregates have been subjected to a suite of tests, "Elementary Acceptance Tests of Fine Aggregate for Civil Works (C-21)," and "Elementary Acceptance Tests of Coarse Aggregates for Civil Works (C-22)," were performed to determine the suitability of aggregates for concrete.

E6.8.4.2 Riprap and Bedding Stone - The stone to be used for this purpose will be free from significant cracks, seams, and overburden spoil. The sources which are suitable for this must not show significant breakdown in the freeze-thaw or wet-dry tests.

E6.8.4.3 Coarse and Fine Aggregates for Concrete - These materials will be a sound, hard, durable material that is produced from a crushed product and shall be free from cracks, seams, organic and deleterious materials. Aggregates that contain 5 percent or more of potentially reactive chert will require low alkali cement. Aggregates that contain a combined total of 20 percent or more of potentially reactive chert will not be permitted. Coarse aggregates will contain fractured sharp faces, and shall be free of laitence (washing) of coarse aggregates may be required). Fine aggregates may be either natural (lake, beach, or glacial) or manufactured sand (crushed dolomite, limesone, or crushed conglomerates).

E6.8.5 Material Sources.

E6.8.5.1 General - Riprap and bedding stone can be produced from the indicated sources listed in the "Possible Material Sources," Plate E6. It is possible that all the material from these sources is not suitable. The right one will be reserved in the specifications to reject materials from certain localized areas, zones, strata, channels, or stockpiles when such materials are deemed unsuitable.

Selective quarrying will be required for the production of riprap. The specifications will require that shale and other undesirable materials will be excluded by adequate processing.

E6.8.5.2 Sources - Four convenient sources are capable of producing the required materials. They are all located within a 20-mile radius of the project, and will be transported by truck. Material source information for each material type relating number of possible sources and distances from the project site follows.

E6.8.5.3 Type A Stone (18-inch Riprap) - Four sources within a 20-mile radius.

E6.8.5.4 Type B Stone (Bedding Material) - Four sources within a 20-mile radius.

E6.8.5.5 Type C Stone (Coarse Aggregate for Concrete) - Two sources within a 20-mile radius.

E6.8.5.6 Type C Stone (Fine Aggregate for Concrete) - Two sources within a 20-mile radius.

E7. CONSTRUCTION CONSIDERATIONS

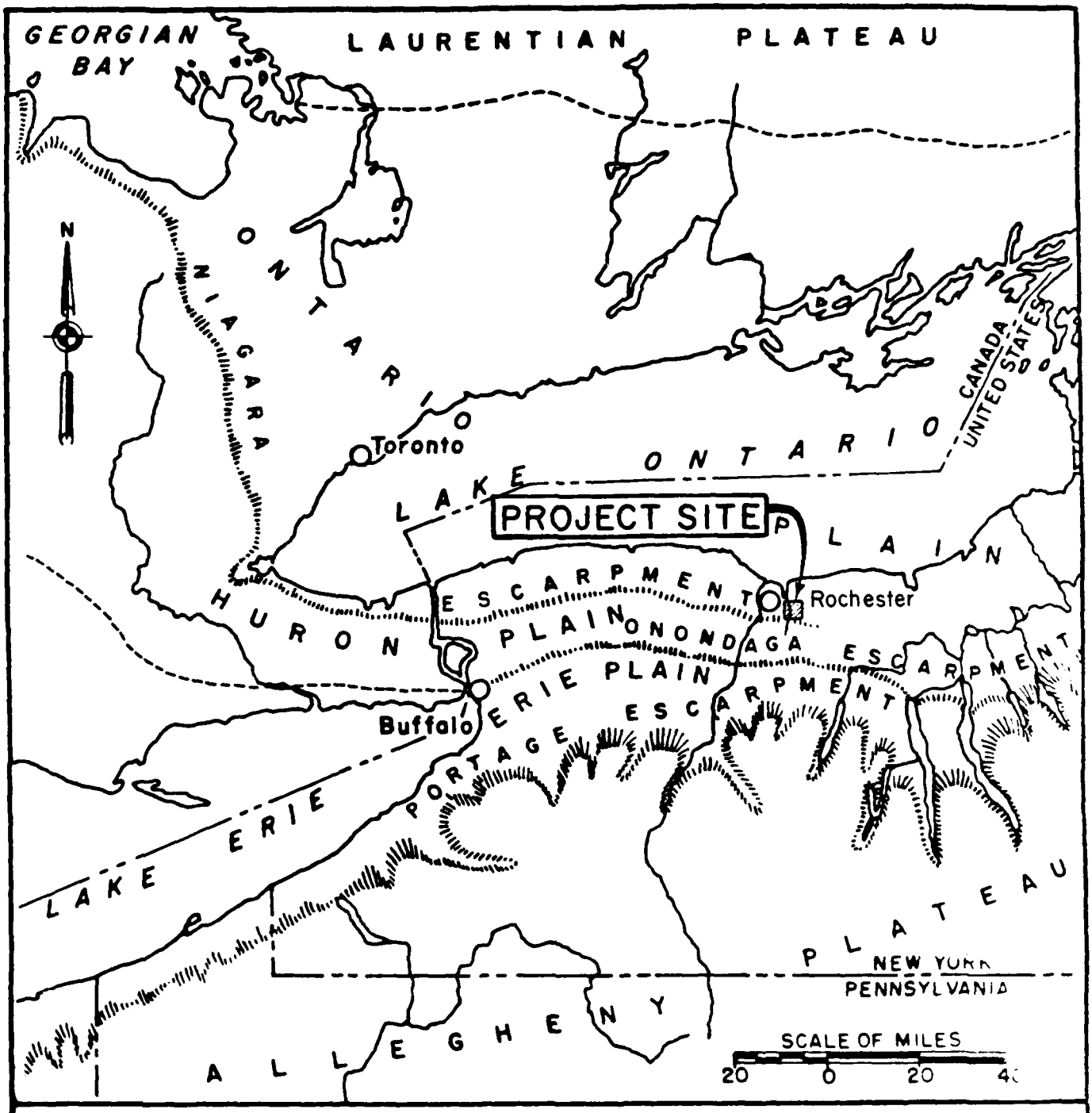
E7.1 General.

Due to the excavation of the inspection trench for the earth levee, groundwater problems should be anticipated. Pumping significant quantities of

water may be required if construction is performed at a time when the ground water surface is high.

E7.2 Backfill for Inspection Trenches.

Compaction of the semi-imperious core must be performed in the dry to assure that seepage problems will be eliminated at times of high flow. Cutoff trenches or well points probably will not be an effective alternative because of the high permeability of the subsurface sand stratum.



SKETCH MAP OF PHYSIOGRAPHIC DIVISIONS IN THE LAKE ONTARIO LAKE ERIE REGION

KINDLE, E.H. AND TAYLOR, F.B., 1913, DESCRIPTION OF THE NIAGARA QUADRANGLE (N.Y.): U.S. GEOL. SURVEY GEOL. ATLAS, FOLIO 190

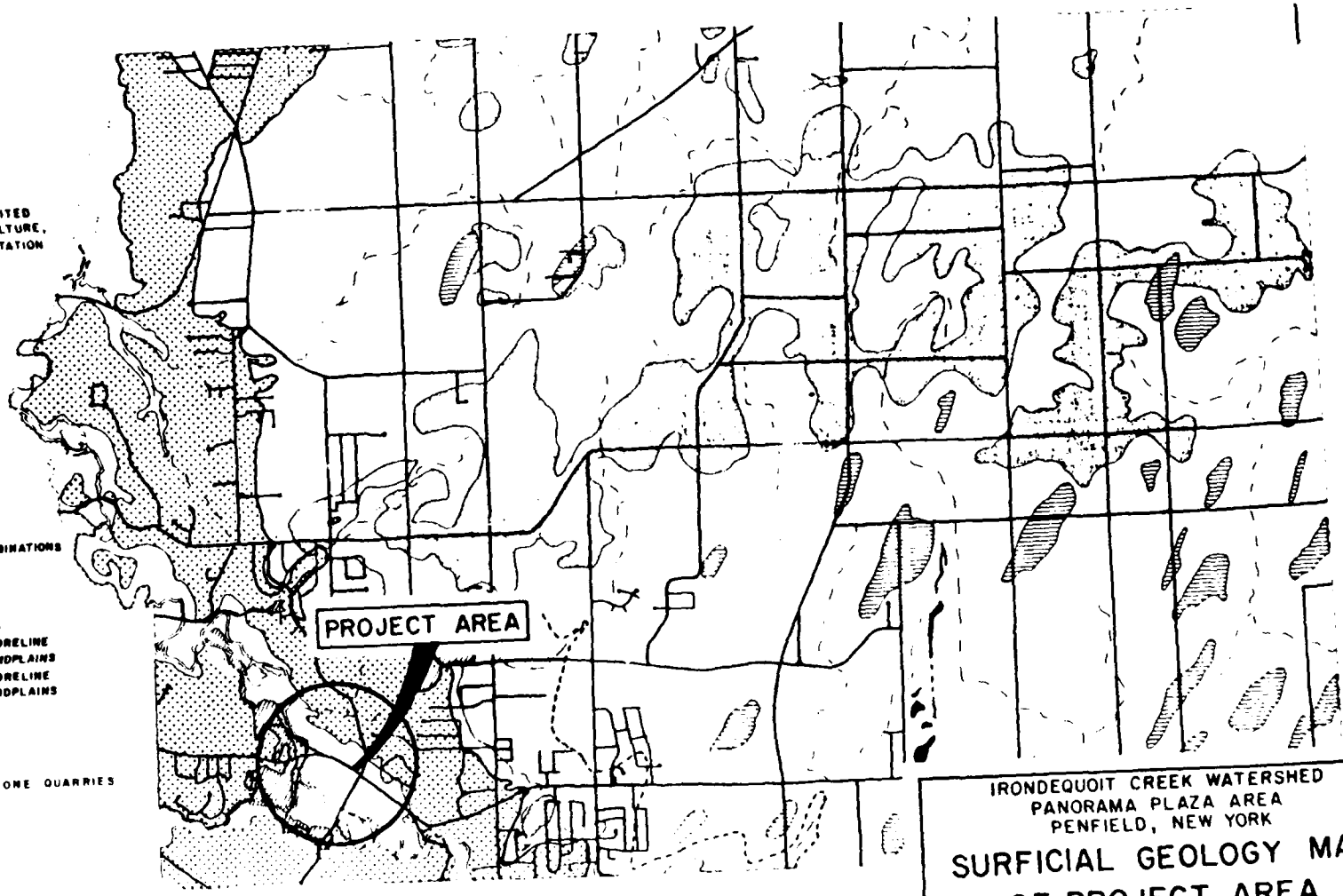
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

PHYSIOGRAPHIC DIVISIONS

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE E1



SOURCE:

SOIL CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, "GEOLOGY AND SOIL INTERPRETATION REPORT." 1985.

GLACIAL STRUCTURES
- MORAINE BELTS
- ESKER - DELTA COMBINATIONS
- DRUMLINS

GLACIAL LAKE FEATURES
- LAKE IROQUOIS SHORELINE
- LAKE IROQUOIS SANDPLAINS
- LAKE DAWSON SHORELINE
- LAKE DAWSON SANDPLAINS

BASE MAP LEGEND
- WATER BODIES
- GRAVEL PITS & STONE QUARRIES
- STREAMS

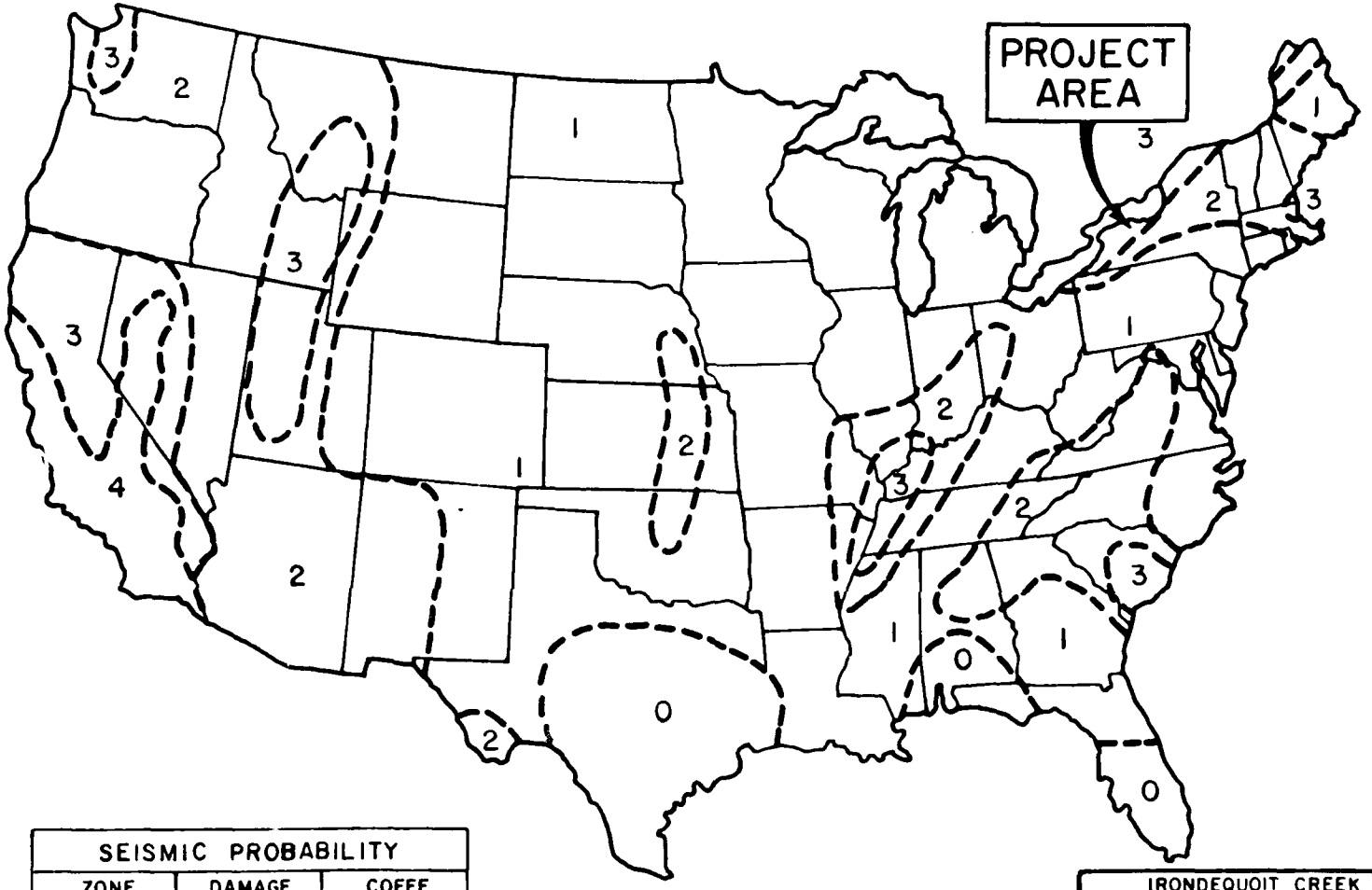
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

SURFICIAL GEOLOGY MAP OF PROJECT AREA

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE E 2



SEISMIC PROBABILITY		
ZONE	DAMAGE	COEFF.
0	NONE	0
1	MINOR	0.025
2	MODERATE	0.05
3	MAJOR	0.10
4	GREAT	0.15

NOTE:

EXTRACTED FROM ERIIIO-2-1806
IO APRIL 77.

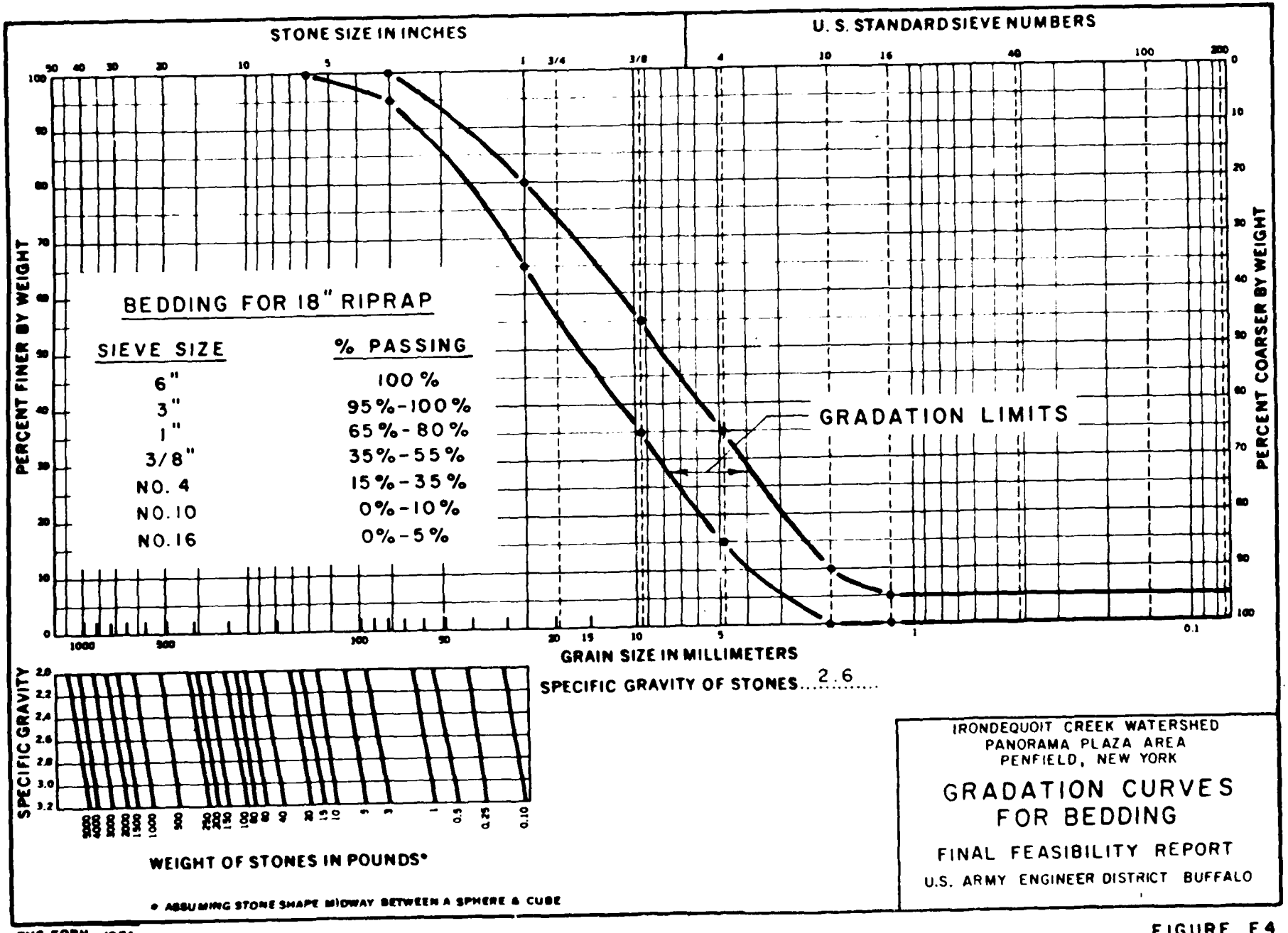
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

SEISMIC RISK ZONES

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE E3



IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

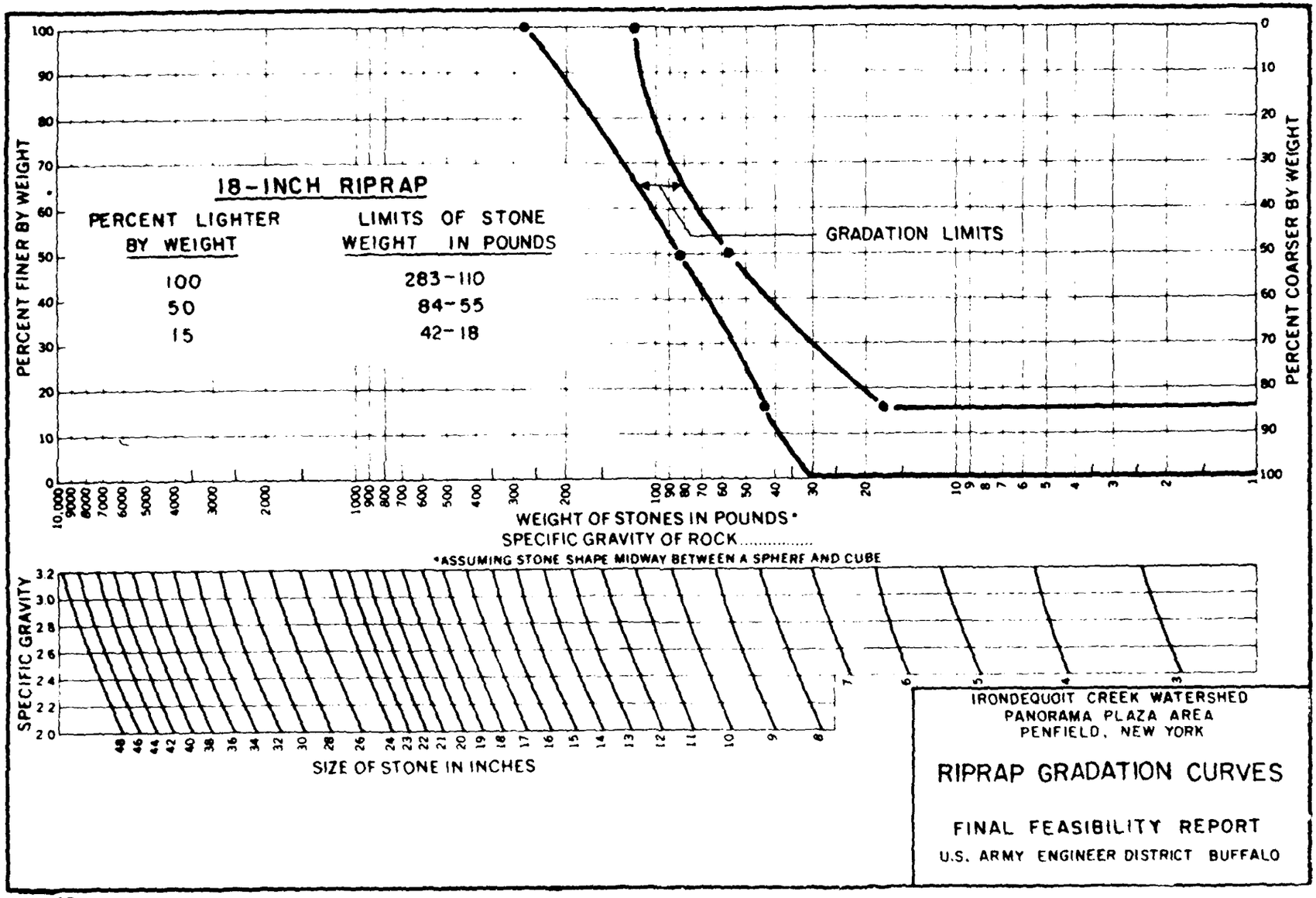
GRADATION CURVES FOR BEDDING

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

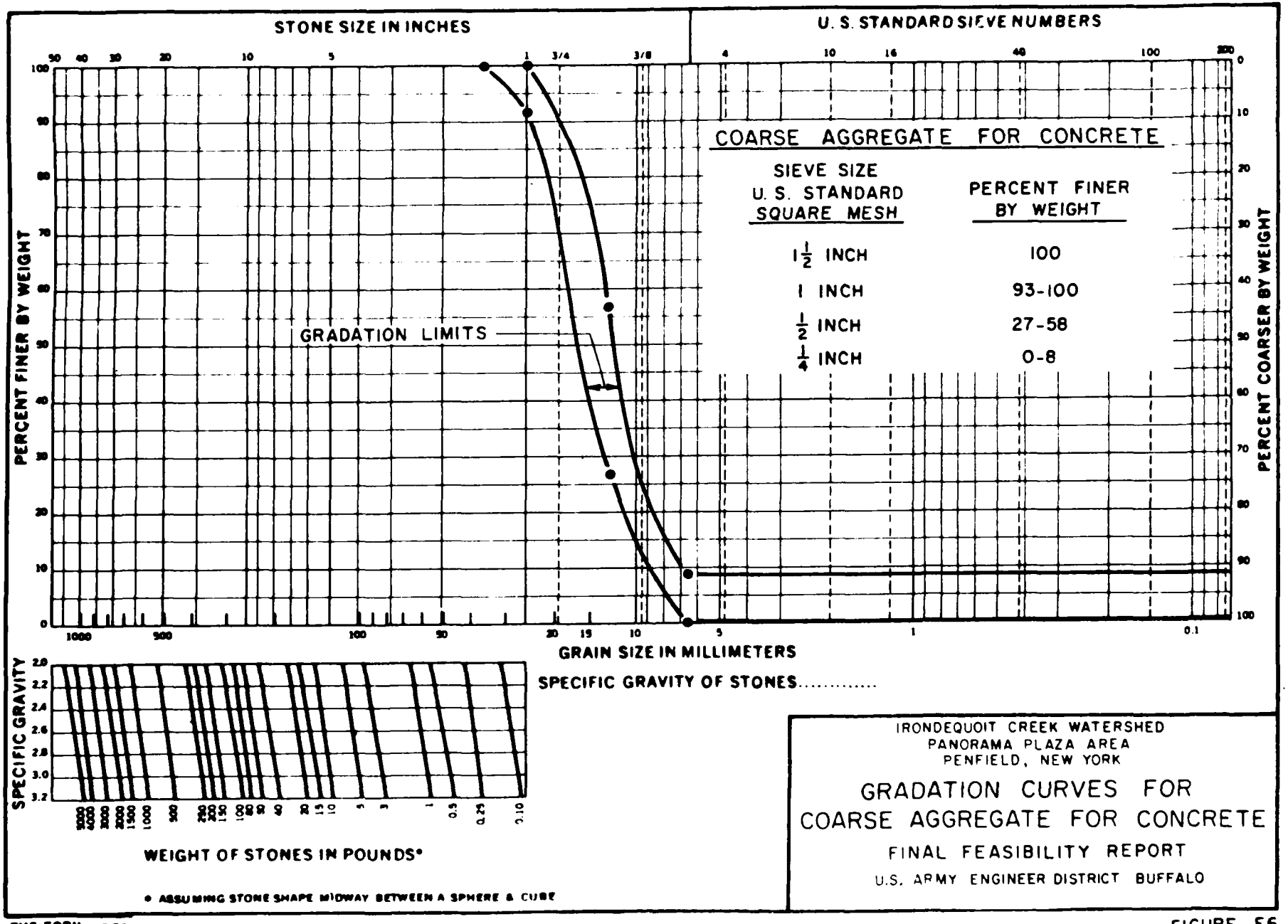
ENG FORM 4056
APR 67

FIGURE E4



ENG FORM 4055
APR 61

FIGURE E-5



IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

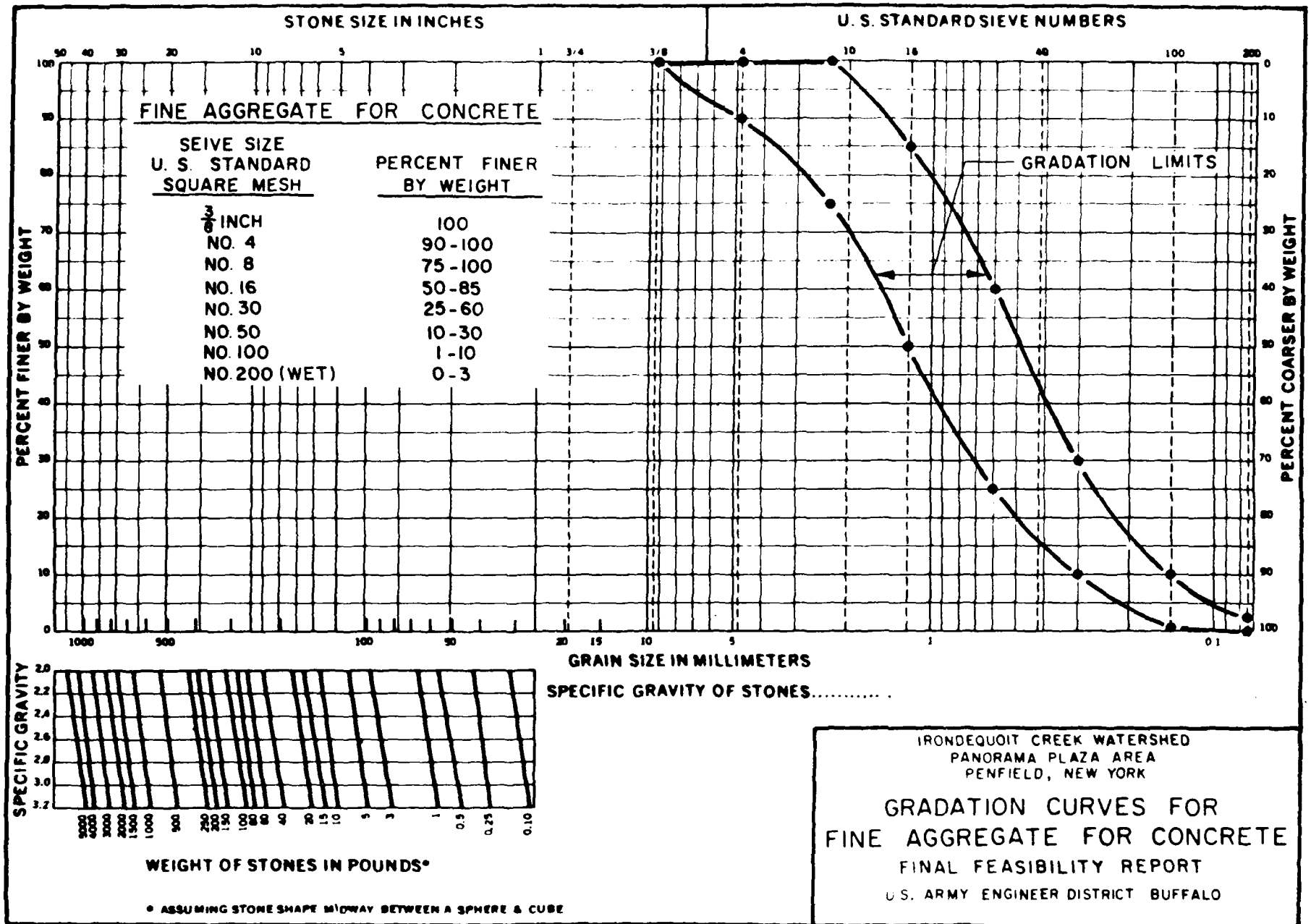
GRADATION CURVES FOR COARSE AGGREGATE FOR CONCRETE

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO

ENG FORM 4056
APR 67

FIGURE E6

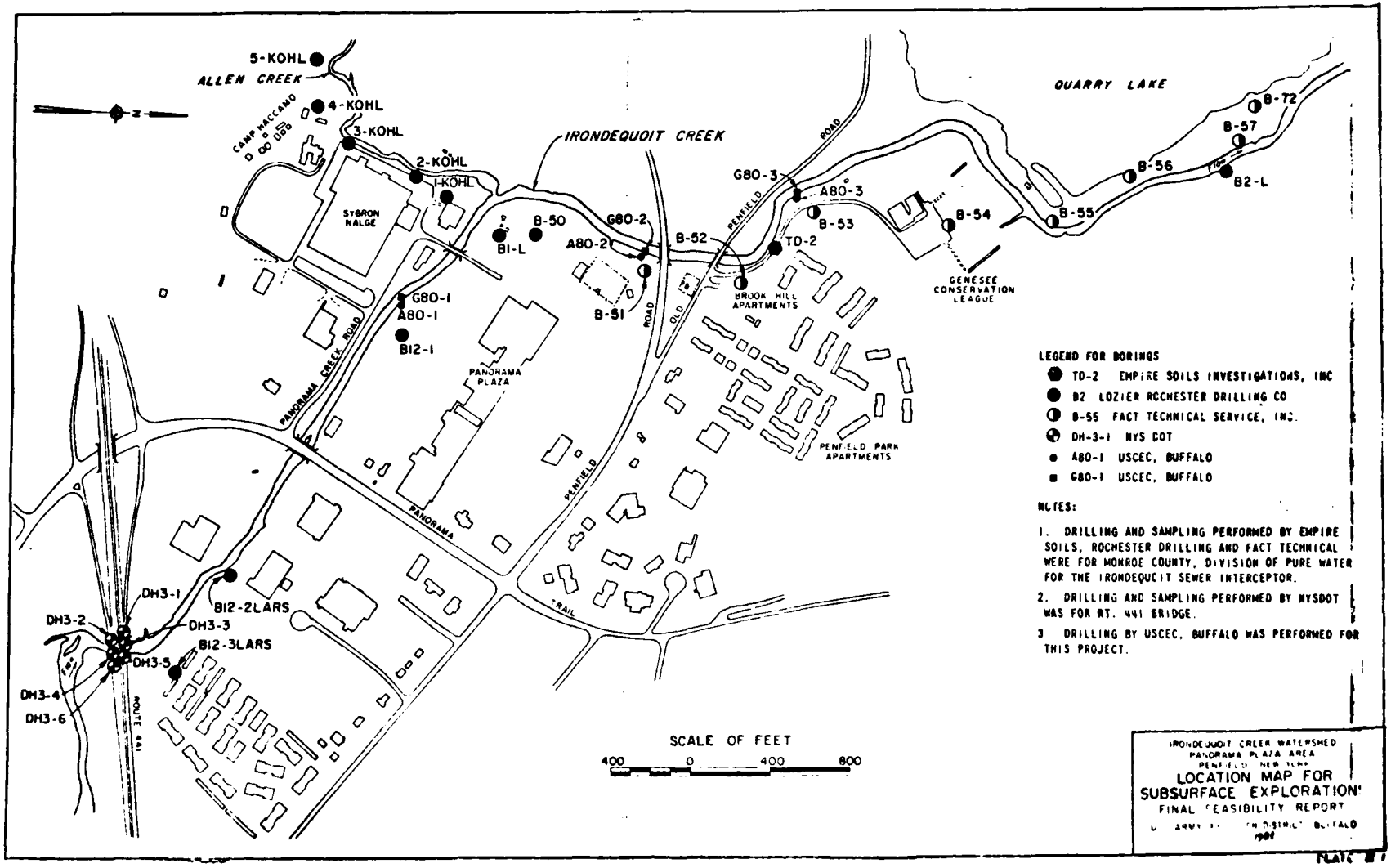


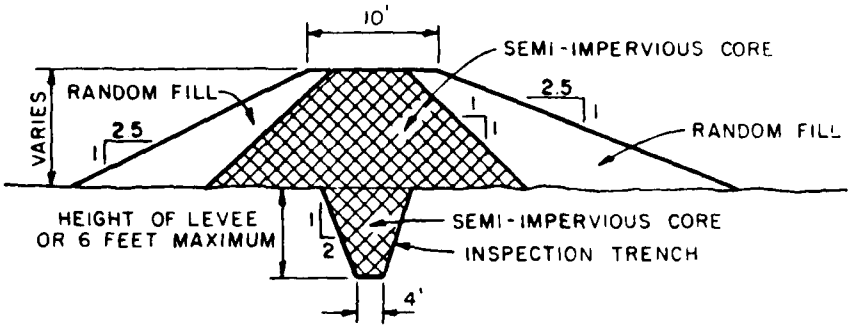
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

GRADATION CURVES FOR
FINE AGGREGATE FOR CONCRETE
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO

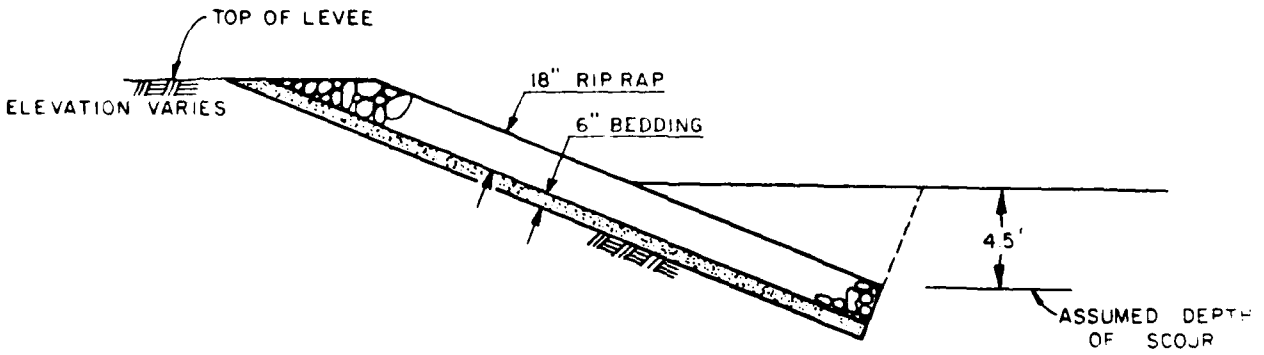
ENG FORM 4056
APR 67

FIGURE E7


5-KOHL
ALLEN CREEK
4-KOHL
3-KOHL
2-KOHL
1-KOHL
CAMP HACCAMO
SYBRON NALGE
IRONDEQUOIT CREEK
B-50
B1-L
G80-2
A80-2
B-52
B-51
G80-1
A80-1
B12-1
PANORAMA CREEK ROAD
PANORAMA PLAZA
PANORAMA
PENFIELD
OLD PENFIELD ROAD
TRAIL
G80-3
A80-3
B-53
TD-2
B-54
BROOK HILL APARTMENTS
PENFIELD PARK APARTMENTS
GENESEE CONSERVATION LEAGUE
QUARRY LAKE
B-55
B-56
B-57
B-72
B2-L
DH3-1
DH3-2
DH3-3
DH3-5
DH3-4
DH3-6
B12-2LARS
B12-3LARS
ROUTE 441
SCALE OF FEET
400 0 400 800
LEGEND FOR BORINGS
TD-2 EMPIRE SOILS INVESTIGATIONS, INC
B2 LOZIER ROCHESTER DRILLING CO
B-55 FACT TECHNICAL SERVICE, INC.
DH-3-1 NYS DOT
A80-1 USCEC, BUFFALO
G80-1 USCEC, BUFFALO
NOTES:
1. DRILLING AND SAMPLING PERFORMED BY EMPIRE SOILS, ROCHESTER DRILLING AND FACT TECHNICAL WERE FOR MONROE COUNTY, DIVISION OF PURE WATER FOR THE IRONDEQUOIT SEWER INTERCEPTOR.
2. DRILLING AND SAMPLING PERFORMED BY NYSDOT WAS FOR RT. 441 BRIDGE.
3 DRILLING BY USCEC, BUFFALO WAS PERFORMED FOR THIS PROJECT.
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD NEW YORK
LOCATION MAP FOR SUBSURFACE EXPLORATION
FINAL FEASIBILITY REPORT
1981



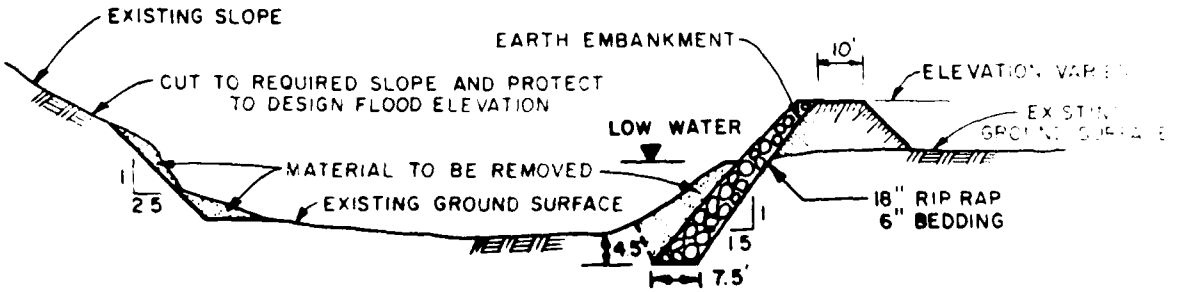
TYPICAL SECTION THROUGH LEVEE



TYPICAL LEVEE SECTION WITH RIP RAP

METHOD A

EM-1110-2-1601, APPENDIX III



TYPICAL SECTION THROUGH CHANNEL WITH LEVEE

METHOD D

EM-1110-2-1601, APPENDIX III

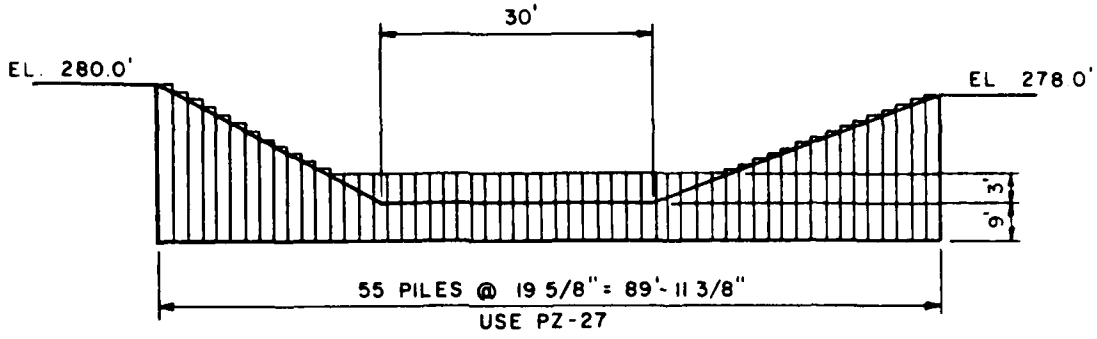
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

TYPICAL CROSS SECTIONS

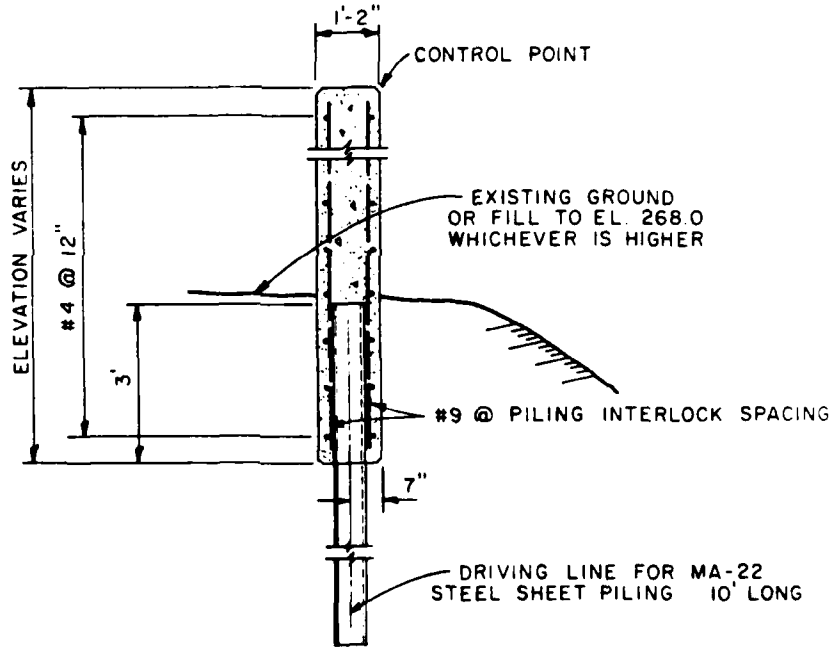
FINAL FEASIBILITY REPORT

U S ARMY ENGINEER DISTRICT BUFFALO

PLATE E2



3' DROP STRUCTURE @ STA. 8+50 ALLEN CREEK



TYPICAL I-WALL (FLOODWALL)

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

TYPICAL CROSS SECTIONS

FINAL FEASIBILITY REPORT

U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

PLATE E3

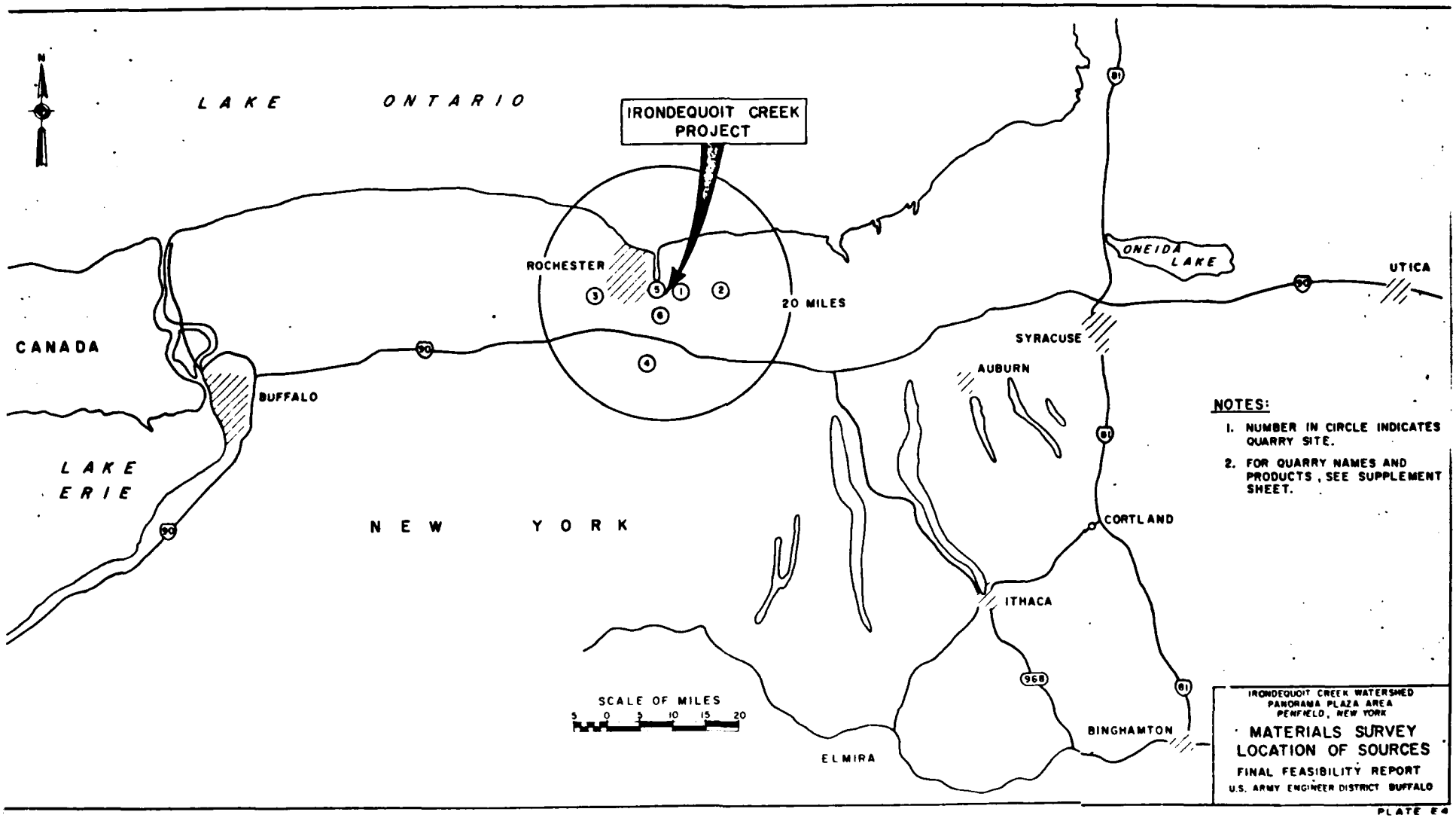

N
LAKE ONTARIO
IRONDEQUOIT CREEK PROJECT
ROCHESTER
20 MILES
ONEIDA LAKE
UTICA
CANADA
BUFFALO
SYRACUSE
AUBURN
LAKE ERIE
NEW YORK
CORTLAND
ITHACA
BINGHAMTON
ELMIRA
SCALE OF MILES
5 0 5 10 15 20
NOTES:
1. NUMBER IN CIRCLE INDICATES QUARRY SITE.
2. FOR QUARRY NAMES AND PRODUCTS, SEE SUPPLEMENT SHEET.
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
MATERIALS SURVEY
LOCATION OF SOURCES
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO

PLATE E4

MAP SUPPLEMENT SHEET
SUMMARY OF POSSIBLE SOURCES FOR CONSTRUCTION MATERIALS

SITE NUMBER	SOURCE	QUARRY OR PIT LOCATION	RADIAL DISTANCE	RIPRAP 18 INCHES	BEDDING	COARSE AGGREGATE	FINE AGGREGATE
1.	DOLOMITE PRODUCTS INC.	PENFIELD, N.Y.	2 MI.	X	X	X	
2.	DOLOMITE PRODUCTS, INC.	WALWORTH, N.Y.	12 MI.	X	X		
3.	DOLOMITE PRODUCTS, INC.	GATES CENTER, N.Y.	13 MI.	X	X	X	
4.	GENERAL CRUSHED STONE CO.	HONEOYE FALLS, N.Y.	14 MI.	X	X		
5.	MANITOU CONST. CO., INC.	PENFIELD, N.Y.	1 MI.				X
6.	GENESEE SAND AND GRAV. CORP.	PITTSFORD, N.Y.	4 MI.				X

NOTES:

RIPRAP 18 INCHES — COARSE AGGREGATE 1 1/2 INCHES - 1/4 INCH

BEDDING 6 INCHES - NO. 16 — FINE AGGREGATE 3/8 INCH - NO. 200

X - INDICATES QUARRY CAPABLE OF PRODUCING STONE INDICATED.

IRONDEQUOIT CREEK, WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

MATERIAL SURVEY
SUMMARY OF SOURCES

FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE F5

POSSIBLE SOURCES FOR BEDDING AND RIPRAP (18") AND COARSE AND FINE AGGREGATES FOR CONCRETE

SOURCE	ROCK TYPE	PROPOSED USE	APPROX. DISTANCE	LABORATORY TEST RECORD			SERVICE RECORD			REMARKS
				DATE TESTED	LABORATORY	PROJECT FOR WHICH TESTED	DATE USED	PROJECT	EVALUATION	
DOLOMITE PRODUCTS CO., INC. QUARRY AT PENFIELD, N.Y. OFFICE AT ROCHESTER, N.Y.	LOCKPORT FORMATION (DOLOMITE)	COARSE AGGREGATE RIPRAP BEDDING	[illegible]	JUNE 1973	OCD LAB LAB # 103/73.630C	CONFINED DREDGE SPOIL DISPOSAL PROGRAM	[illegible]	[illegible]	[illegible]	GAIL FACILITIES OK' AVAILABLE. UNIT WEIGHT VARIES FROM 160 P.C.F. TO 171 P.C.F.
				SEPTEMBER 1976	OCD LAB LAB # 103/76.6230	CONFINED DIKED DISPOSAL PROGRAM STATEN HARBOR, NEW YORK (GRAVEL STONE)	[illegible]	[illegible]	[illegible]	FOR THIS TESTING, SP. G. WAS VARIED FROM 160 P.C.F. TO 172 P.C.F.
DOLOMITE PRODUCTS, INC. QUARRY AT WALWORTH, N.Y. OFFICE AT ROCHESTER, N.Y.	LOCKPORT DOLOMITE	RIPRAP BEDDING	2 MI.	JUNE 1976	OCD LAB LAB # 103/76.6230	STATEN CONFINED DIKE DISPOSAL AREA (RIPRAP)	[illegible]	[illegible]	[illegible]	SPECIFIC GRAVITY VAR ES 2.6 - 2.75 ONLY BAR ORCHARD MEMBER (TOP LIFT) SUITABLE FOR GRAVEL STONE.
DOLOMITE PRODUCTS, INC. QUARRY AT GATES CENTER, N.Y. OFFICE AT ROCHESTER, N.Y.	LOCKPORT DOLOMITE	COARSE AGGREGATE RIPRAP BEDDING	1 MI.	MAY 1972	OCD LAB LAB # 103/72.610C	BAR ORCHARD HARBOR, N.Y., (CORE STONE, COVER STONE, CONCRETE AGGREGATE)	[illegible]	[illegible]	[illegible]	ONLY FIRST LIFT (TOP 6.5 MEMBER) ACCEPTABLE FOR THIS PROJECT. SPECIFIC GRAVITY 2.7% GAIL FACILITIES AVAILABLE AT QUARRY.
							1976	NYS - DOT LAKE ONTARIO STATE PARKWAY, LONG POND AND CONRACHTY CREEK, N.Y.	NYS - DOT HEAVY STONE FILLING SATISFACTORY, BLASTING FRACTURES AND BREAKAGE (LESS THAN 10%)	
GENERAL CRUSHED STONE CO. QUARRY AT HOWE'S FALLS, N.Y. OFFICE AT EASTON, PA.	ONONDAGA LIMESTONE	RIPRAP BEDDING	6 MI.	DECEMBER 1971	OCD LAB LAB # 103/72.602C	WELLSVILLE RECTIFICATION PROJECT WELLSVILLE, N.Y. (RIPRAP)	1971	EMERGENCY REPAIR, LOCAL FLOOD PROTECTION PROJECT, GENESEE RIVER AND DYKE CREEK, WELLSVILLE, N.Y.	RIPRAP (12 INCHES TO 18 INCHES) SATISFACTORY	SPECIFIC GRAVITY VAR ES 2.66 - 2.69. QUARRY NOT RESPONSIBLE FOR GRADATIONS. GAIL FAC. [illegible] ES NOT AVAILABLE.
				JUNE 1976	OCD LAB LAB # 103/76.6230	STATEN CONFINED SPOIL DISPOSAL I (E. (RIPRAP)	[illegible]	[illegible]	[illegible]	SPECIFIC GRAVITY VAR ES 2.66 TO 2.70.
[illegible] CONSTRUCTION CO., INC. PIT AT PENFIELD, N.Y. OFFICE AT ROCHESTER, N.Y.	GLACIAL MATERIAL	FINE AGGREGATE	6 MI.	SEPTEMBER 1977	NYS DOT 78AF98	[illegible]	[illegible]	[illegible]	[illegible]	SSD IS 2.64
[illegible] SAND AND GRAVEL CORPORATION PIT AT PITTSFORD, N.Y. OFFICE AT WEBSTER, N.Y.	GLACIAL MATERIAL	FINE AGGREGATE	9 MI.	SEPTEMBER 1978	NYS DOT 78AF76	[illegible]	[illegible]	[illegible]	[illegible]	SSD IS 2.63

BUFFALO CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK

DATA ON
MATERIAL SOURCES

FINAL FEASIBILITY REPORT
U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
[illegible] 1980

PLATE 16

Subject IRONDEQUOIT CREEK FLOOD CONTROL PROJECT

Computation of RIPRAP DESIGN FOR 100 YEAR FLOOD

Computed by THOMAS J PIETRUS Checked by MEL HILL Date 23 MAY 1?

1. Reference ETL 1110-2-160 and EM 1110-2-160? for riprap design.

A. LOCAL BOUNDARY SHEAR - the shear acting on the stone and soil from the water

$$T_o = \frac{\gamma_w \times \bar{V}^2}{\left(32.6 \log_{10} \frac{12.2 y}{D_{50}}\right)^2}$$

For Section 55+40; $y = 10$ feet (TYPICAL SECT.) $V = 7.1$ feet per second; For 12-inch riprap $W_{50} = 17.2$ Pounds; FOR $\gamma = 160$ PCF; $D_{50} = .64$ feet

$$T_o = \frac{(62.4 \text{ PCF})(7.1 \text{ feet/sec})^2}{\left(32.6 \log_{10} \frac{12.2 (10 \text{ feet})}{.64 \text{ feet}}\right)^2}$$

$T_o = .60$ PSF $\times$ 1.5 (FACTOR OF SAFETY)

$T_o = .90$ PSF

OR: $Y/D_{50} = 15.625 = 10'/.64'$

$K_z = .014$ from Figure 3

$T_o = 1.5 \times 0.014 \times (7.1 \text{ ft/sec})^2$

$T_o = 0.86$

GPO 948-004

Subject: IRONDEQUOIT CREEK FLOOD CONTROL PROJECT

Computation of: RIPRAP DESIGN FOR 100 YEAR FLOOD

Computed by: THOMAS J. PETERS Checked by: MEL HILL Date: 12/13/77

(2.) Riprap design shear τ is the shear resistance by the riprap.

$$\tau = a(\gamma_s - \gamma) D_{50}$$

$$\tau = .040(160 - 62.4\ pcf)(.64\ feet)$$

$$\tau = 2.49\ psf$$

$$\tau' = \tau_o \left(1 - \frac{\sin^2 \Phi}{\sin^2 \theta}\right)^{.5}$$

$$= 2.49\ psf \left(1 - \frac{\sin^2 21.8°}{\sin^2 40°}\right)$$

$$= 1.67\ psf \quad \checkmark$$

Thus $\tau' > \tau_o$, O.K. to use 12"

But, $v = 7.1$ ft/sec ✓

Increase by 50% to 18"

Limits of stone weight in pounds

% Lighter by weight	
100	283 - 113
50	84 - 57
15	42 - 18

Subject IRONDEQUOIT CREEK FLOOD CONTROL PROJECT
Computation of Bedding Material
Computed by JAG Checked by _____ Date 7/2/80

Assumed Soil Gradation

D_{85} (soils) = 1 mm

D_{50} (soils) = .55 mm

D_{15} (soils) = .19 mm

From EM 1110-2-1901

$$\frac{D_{15}\text{ (Filter)}}{D_{85}\text{ (soil)}} \leq 5$$

$$\frac{D_{15}\text{ (Riprap)}}{D_{85}\text{ (Filter)}} \leq 5$$

Given D_{15} (Riprap) 42 lbs → 18 lbs
230 mm → 160 mm

$$\frac{D_{15}\text{ (Filter)}}{D_{85}\text{ (soil)}} \leq 5$$

D_{15} Filter ≤ 5 × 1 mm

D_{15} (Filter) ≤ 5 mm

$$\frac{D_{15}\text{ (Riprap)}}{D_{85}\text{ (Filter)}} \leq 5$$

D_{15} (Riprap) ÷ 5 ≤ D_{85} (Filter)

D_{85} (Filter) ≥ 46 mm → 32 mm

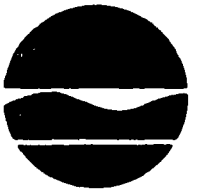
FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX F
PERTINENT CORRESPONDENCE
AND INFORMATION

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233



Robert F. Flacke
Commissioner

May 18, 1982

Colonel Johnson
Buffalo District Engineer
Department of the Army
Buffalo District Corps
of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Colonel Johnson:

At the request of David MacPherson of your staff, this letter will acknowledge receipt of your letter of March 15, 1982 advising that you would recommend no Federal participation for the flood damage reduction project for Irondequoit Creek and submit an unfavorable report to your Division office in Chicago. We concur with this action due to the lack of support of the Penfield Town Board for the recommended plan.

Sincerely,

Richard L. Fousella
for James F. Kelley
Director, Flood Protection Bureau

RLK/br

cc: A. Buddle

NCBPD-EB 15 March 1982

Mr. James F. Kelley
Director, Flood Protection Bureau
New York State Department Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Kelley:

Thank you for the 1 March 1982 letter expressing your intent to provide the required items of non-Federal cooperation for the Irondequoit Creek Flood Damage Reduction Project in the vicinity of Panorama Plaza.

However, our interpretation of your letter and enclosed Penfield Town Board resolution is that the project recommended by the Corps in the Final Feasibility Report (FFR) is not in fact fully supported. What appears to be supported is another study of upstream retention.

Be advised that the Corps during 7-years of pre-authorization study examined all potential flood management options for the Irondequoit Creek Watershed including upstream retention. Our reasons for discarding upstream retention options for a Federal project are summarized in Inclosure 1.

In accordance with Federal principles and standards, the Corps has reviewed all options for potential Federal participation and has determined that the only option warranting Federal implementation is the Panorama Plaza Project with levees and floodwalls, as recommended in the FFR. The state of New York and/or the town of Penfield certainly have the option to pursue alternative projects in the basin at their own expense.

The purpose of the Corps Feasibility Report is to determine whether the Federal Government should participate in a local flood control project and if so, recommend that Congress authorize construction of the alternative that best meets the criteria for Federal participation. We have determined that there is such a project and we must now either recommend that Congress authorize that project for construction or recommend no Federal participation because of lack of local support. Further study will not change the outcome and is therefore not warranted. Minor modification although possible during the design phase could not include such major alterations to the project as upstream retention. Such major changes would require project reauthorization by Congress.

NCBPD-EB
Mr. James F. Kelley

Given that our interpretation of your 1 March 1982 letter is correct, I have no other course of action than to recommend no Federal participation for the flood damage reduction project for Irondequoit Creek and submit an unfavorable report to our Division office in Chicago.

The Corps, however, will continue to provide technical assistance on a limited basis to Monroe County during the NURP Study. However, the reservoirs being investigatd for the NURP Study are primarily designed for water quality improvement and would provide only an insignificant amount of flood protection storage to downstream areas.

Thank you for your fine cooperation on the study effort and we look forward to working with you on other water resource problems of mutual interest.

Sincerely,

1 Incl
as stated

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

15 March 1982

UPSTREAM RETENTION

The Corps of Engineers investigated all flood management options in the Irondequoit Creek Watershed, including upstream retention. Intially 15 reservoir sites, for upstream retention, were selected for investigation based primarily on location without consideration of adverse impacts. The locations were evaluated upon the following criteria: Location with respect to residential areas, drainage areas, stream control, political boundaries, and type of land available. Nine sites were eliminated immediately upon a cursory review of the criteria, due to their adverse impacts. Six of the more viable of these sites were investigated in more detail and are summarized in the Final Feasibility Report (FFR), (Attach 1 and 2). As shown on Attach 2, each of the reservoir sites have a physical capacity in units of acre-feet that is much less than the required storage capacity for significant flood events. As an example, the Linear Park site located just upstream from Panorama Plaza would provide 430 acre-feet of storage but during a 5-year flood with one inch of runoff, 5,330 acre-feet of storage would be required. The required storage is approximately 12 times greater than the available storage. For a flood larger than the 5-year flood, even more storage is required. The required storage could not be met even with a combination of several reservoirs in series.

Any form of retention requires a control structure (i.e. dam) to regulate the amount of flow in the creek. The cost of construction, operation, and maintenance of such a control structure is very expensive compared to other flood control measures. The cost of any reservoir in the Irondequoit Creek Basin would far exceed the benefits accrued to this project.

As a result of inquiry by Town officials during a public meeting held in the Spring 1981, a combination of upstream retention and levees/floodwalls for protection of the Panorama Plaza area was briefly evaluated. None of the evaluated reservoirs would provide adequate storage to effectively reduce the flood stages (depths) downstream to warrant a significant reduction in the height of the levees/floodwalls. The cost reduction due to small lowering of the levee/floodwalls heights would not offset the high costs of constructing the reservoir control structures. Therefore, this combination alternative was not determined to be economically feasible for a Federal project.

Town of Penfield officials during a recent informational meeting questioned whether small off channel man-made retention ponds along Irondequoit Creek would provide adequate flood protection. This type of design would be beneficial from an environmental and recreational standpoint, however, the ponds would require minimum water levels at all times of the year and would have an insignificant amount of additional flood water storage. Not only are they not practical in the Irondequoit Creek Basin based on design criteria but the ponds would not be economically justified due to the expensive real estate costs.

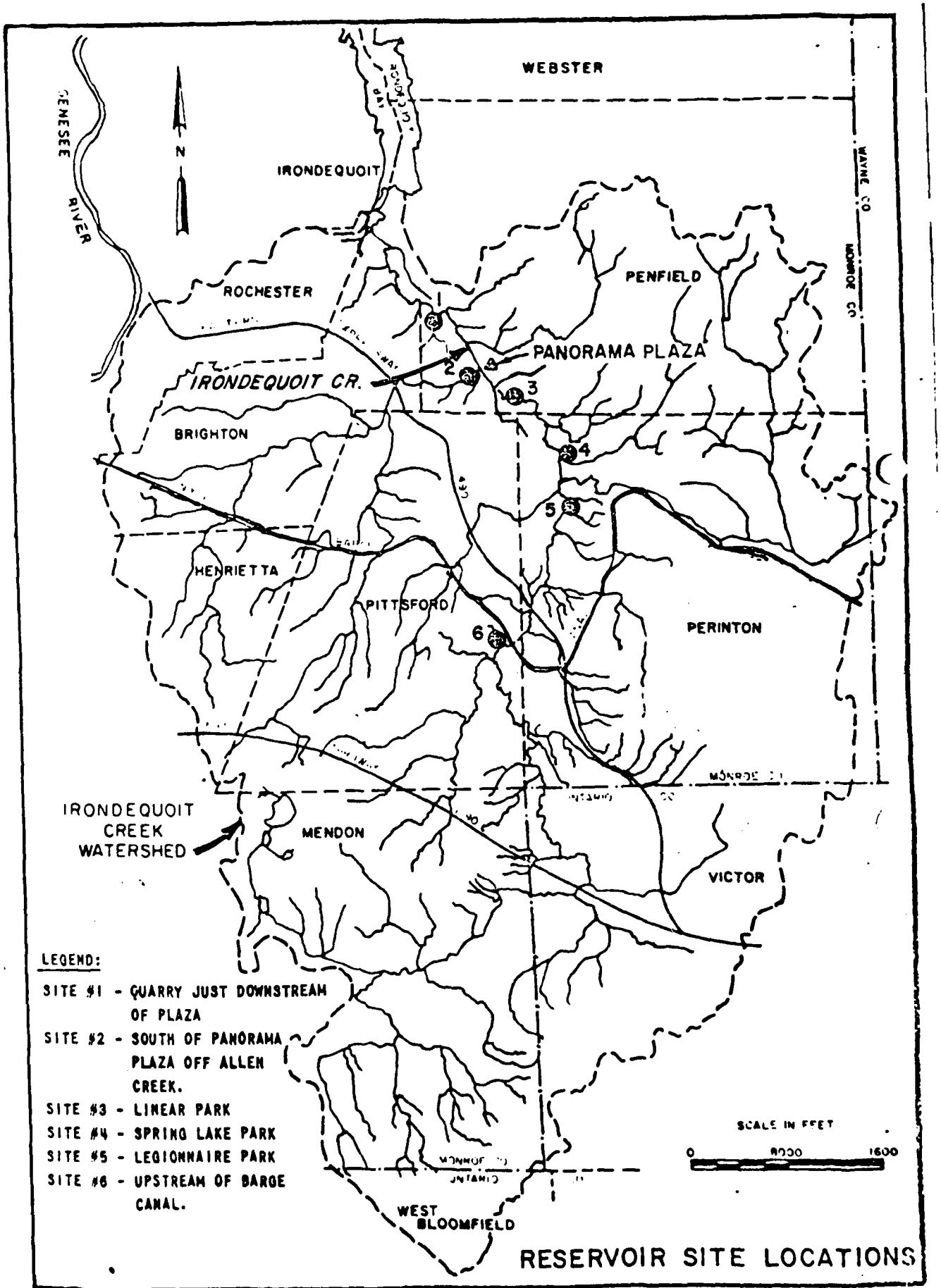
A non-structural plan can be implemented by the State, County or Town at their own expense. Such a plan was recommended in the FFR for the watershed. The non-structural plan included a combination of flood insurance, flood plain requlations, and flood proofing. A flood warning system could also be implemented. These items were evaluated but did not meet criteria for a Federal project.

The evaluation of all flood management measures resulted in identifying only one structural measure warranting Federal implementation. The Corps recommended plan is Alternative B, a levee/floodwall plan in the vicinity of Panorama Plaza - Penfield, New York.

TABLE 6 - Reservoir Site Comparison - Availavble vs. Required Storage

Reservoir Site	Location	Drainage Area	Available Storage	Required Storage For 1"1/ Runoff	Required Storage For 2"2/ Runoff	Required Storage For 3" Runoff
No. 1 Quarry	On Irondequoit Creek, downstream of Old Penfield Road.	130	1,322	6,933	13,867	20,800
No. 2 Sybron/Nagle	On Allen Creek, behind Sybron/Nagle factory, just upstream of Irondequoit Creek.	28	430	1,490	2,990	4,480
No. 3 Linear Park	On Irondequoit Creek, just upstream of theRoute 441 Bridge.	100	430	5,330	10,670	16,000
No. 4 Spring Lake Pk.	On Irondequoit Creek, just upstream of the Linden Ave Bridge	92	770	4,910	9,815	14,720
No. 5 Legion-Eyre Pk.	On Irondequoit Creek, at the Thomas Creek confluence.	87	595	4,640	9,280	13,920
No. 6 Barge Canal	On Irondequoit Creek, on the upstream side of the Barge Canal crossover of Irondequoit Creek.	50	770	2,660	5,330	8,000

Note: Drainage areas are in square miles.
Unit of storage are in acre-feet.
Amounts of storage are based on preliminary computations only.
Available storage is based on existing conditions.
Required storage does not take existing channel storage into account.
Available storage for site No. 1 quarry is an estimate.
Only a surface area of 33.1 acres is known. The amount of 1.322 is based is based on a uniform depth of 40' with the quarry having vertical sides.
1/ - 5-year event
2/ - 100-year event



RESERVOIR SITE LOCATIONS

SKETCH 5

TOWN OF PENFIELD

3100 Atlantic Ave.
Penfield, N.Y. 14526

IRENE L. GOSSIN, Supervisor

February 23, 1982

Colonel George P. Johnson
District Engineer
US Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, N. Y. 14207

Dear Colonel Johnson:

I am enclosing copies of a resolution adopted by the Penfield Town Board on February 22 indicating our continuing interest in the Irondequoit Creek Flood Protection Project. Also, enclosed is a cover letter addressed to Richard Konsella, Chief, Flood Control Projects Section, DEC.

I believe both documents fairly state the concerns of the Town Board.

May I also express our appreciation for granting an extension of time as requested in December as well as the meeting of January 10 attended by members of your staff.

Yours truly,

Irene L. Gossin

Irene L. Gossin
Supervisor

ILG:bf
cc: DEC
Town Board & Town Attorney
Planning Board
Zoning Board
Conservation Board
DPW

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

R.F.

Robert F. Flacke
Commissioner

March 1, 1982

Colonel George Johnson
District Engineer
U. S. Corps of Engineers
Dept. of the Army
1776 Niagara Street
Buffalo, NY 14207

Dear Colonel Johnson:

At a special meeting of the Penfield Town Board on February 22, 1982 the Board adopted a resolution expressing a continuing interest in the Irondequoit Creek Flood Protection Project in the vicinity of Panorama Plaza. A copy of that resolution is enclosed for your information and files. You will note that the resolution asks that you consider modifications in the project design. We ask that you give such considerations as are reasonable in future phases of the study.

Based upon the expression of continuing interest by the Town Board, it is the intent of this Department to provide the required items of non-Federal cooperation for a project which is engineeringly and environmentally sound, economically justified and meets local needs.

Sincerely,

James Kelley

James F. Kelley
Director
Flood Protection Bureau

RLK:pt

Enclosure

cc: I. L. Gossin, Supervisor/wo/enclosure
A. Buddle/w/enclosure

TOWN OF PENFIELD

3100 Atlantic Ave.
Penfield, N.Y. 14526

IRENE L. GOSSIN, Supervisor

February 23, 1982

Richard L. Konsella, P.E.
Chief, Flood Control Projects Section
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, N. Y. 12233

Dear Mr. Konsella:

The Penfield Town Board appreciated your meeting with us and Corps of Engineers staff on February 10 regarding the Irondequoit Creek Flood Protection Project.

As we explained to you, we were committed to participation in the Association of Towns annual meeting in NYCity during the following week. However, at a special Town Board meeting last evening, February 22, the Board unanimously approved a resolution indicating a continuing interest in the project. A certified copy of the resolution is attached.

You will note that the resolution expresses concern over the intensity of the project and urges consideration of a combination of upstream retention and possibly structural improvements in the Panorama area. We strongly request that our concerns be addressed by the Corps and DEC and would appreciate being advised should any other programs emerge which would be helpful in controlling the concentration and confluence of flood waters in the Town of Penfield.

Finally, we understand that this resolution of approval in no way commits the Town to final approval nor assurances of local funding.

Yours truly,

Irene L. Gossin, Supervisor

ILG:bf
cc: Corps of Engineers
Town Board & Town Atty
Planning Board
Zoning Board
Conservation Board

By: Councilman Donald Wink — Public Works Committee

Resolution No. 70 of 1982 — February 22, 1982

Irondequoit Creek Flood Protection Project - U.S. Corps of Engineers

WHEREAS, the U.S. Corps of Engineers was authorized by Congress in 1965 to look at the Irondequoit Creek Watershed and

WHEREAS, the Watershed drains approxiamtely 139 square miles involving Monroe, Ontario and Wayne Counties and

WHEREAS, in a study completed by the U.S. Corps of Engineers - Buffalo District in 1968, twenty flood prone areas in this watershed were reviewed and evaluated and

WHEREAS, the area in the Town of Penfield near Panorama Plaza where Allens Creek and Irondequoit Creek come together, was the only one recommended for structural flood protection and

WHEREAS, this protection consists of a levee/flood wall plan designed with a 500 year level of protection and

WHEREAS, the cost of the project would be financed by Federal and local funds (State and Town) and

WHEREAS, the cost of maintenance after completion would become an obligation of the Town of Penfield and

WHEREAS, this cost is estimated at $74,500 yearly based on present costs and

WHEREAS, a public hearing was held by the Corps of Engineers in April of 1981 and an informational meeting was held by the Town of Penfield on February 2, 1982 for the merchants and property owners in the affected area and

WHEREAS, the New York State Department of Environmental Conservation has requested from the Town of Penfield a letter indicating a continuing interest in this project.

BE IT RESOLVED, that the Town of Penfield does indicate a continuing interest in this project and

BE IT FURTHER RESOLVED, that in the design of this project, the Corps of Engineers consider modifications that would make the project less intense by again considering a combination of upstream retention and flood walls/levees in the Panorama area.

BE IT FURTHER RESOLVED, that the Corps of Engineers keep the property owners of the affected area and the Town of Penfield informed of all progress during design and

BE IT FURTHER RESOLVED, that the Corps of Engineers contact and work with the Nationwide Urban Runoff Program (NURP) and Monroe County Planning in their "Study of Pollution in the Irondequoit Basin from Stormwater Runoff".

Moved By: CM Wink

Seconded By: CM Fonte

Vote:		
	Fonte	Aye
	Gossin	"
	Nolan	"
	Philbrick	"
	Wink	"

CERTIFIED TO BE A TRUE COPY OF RESOLUTION ON FILE IN TOWN CLERK'S OFFICE – PENFIELD, N. Y.

Cathleen J. Weil

DATED : 2/23/82 Deputy TOWN CLERK

1982 FEB 19 PM 2 25

TOWN CLERK

NCBPD-ER 22 December 1981

Mr. James F. Kelley
Director, Flood Protection Bureau
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Kelley:

Thank you for your 10 December 1981 update on the status of developing a letter of intent to participate in a flood damage reduction project for the Irondequoit Creek Watershed in the town of Penfield. The need for an additional 3 months for notification of the State's intent is acknowledged. The delay and continued uncertainty, however, does provide us with some difficulty, particularly with respect to programming future budgets. The Corps has completed its study of the watershed and has recommended a plan to significantly reduce future flooding problems in the Panorama Plaza area of Penfield, NY. The environmental impact statement, and our final feasibility report, with a recommended solution plan, were completed in July 1981. Uncertainty of local support since then has made it difficult to program and schedule future project activities.

My staff informs me that NYSDEC has contacted the town of Penfield several times since April 1981, requesting a letter of support for the recommended flood damage control project, and no letter has been provided. Obviously, we are ready to provide whatever information the town officials need in reaching a decision. My staff will be available to meet with you and the town of Penfield in late January as you requested. However, if no definitive position is taken by mid-February, I must send my report to Congress recommending that no project be constructed and that the study authorization be closed.

The State and town of Penfield retain the option to construct the Panorama Plaza project without Federal funds. Nonstructural measures for upper basin water resource management remain a non-Federal responsibility as presented in the report.

NCBPD-EB
Mr. James F. Kelley

sw/2245

If you have any questions regarding this action, please contact Mr. David MacPherson, Study Manager, at (716) 876-5454, extension 2245.

Sincerely,

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

CF:
✓NCBPD-EB

Ms. Anna Bundshuh
Supervisor - Penfield
3100 Atlantic Avenue
Penfield, NY 14526

MacPherson DRM 12/22
Kelly
Gilbert CEG 12/22
Baldi
Creeden
Johnson

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Robert F. Flacke
Commissioner

December 10,1981

Colonel George P. Johnson
District Engineer
US Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

This is to advise you of the status of your request of March 30, 1981 for a letter of intent to participate in a flood damage reduction project for the Irondequoit Creek Watershed in the Town of Penfield. We have corresponded with Supervisor Bundschuh on several occasions since last March requesting an expression of interest. We have provided copies of that correspondence to Mr. Dan Kelly of your staff. In our most recent letter, dated November 24, 1981, we advised the Town of Penfield that we must have a letter stating the intent of the Town of Penfield to participate in the proposed project by December 10, 1981.

Enclosed is a copy of a reply from the Town requesting an extension of time in which to reach a decision and stating their desire for a further meeting with your staff to obtain answers to specific questions which they have not yet developed. Also enclosed is a copy of our response asking that questions be developed as soon as possible and furnished to this office at least two weeks prior to a meeting which we suggest should be scheduled for late January, 1982. Upon receipt of the Town's questions they will be immediately forwarded to you along with any comments which my staff may have.

I sincerely regret that we are still unable to furnish a letter of intent regarding the proposed Irondequoit Creek Project some eight months after your request and the subsequent public meeting. As I am sure you are aware, certain items of non-Federal participation in a flood protection project are delegated to the local government under an agreement similar to the State-Federal Agreement of Cooperation, thus, we must have an expression of intent to participate from the local government prior to furnishing a letter of intent to the Corps of Engineers.

Based upon the request from the Town of Penfield for additional time to reach a decision and the lengthy delays already experienced, we suggest that you revise your timetable for this project to allow at least an additional three months for notification of the State's intention concerning participation in this project.

Sincerely,

James F. Kelley, Director
Flood Protection Bureau

Encl.
cc: Town of Penfield,

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Robert F. Flacke
Commissioner

December 10, 1981

Ms. Anna Bundschuh
Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Dear Supervisor Bundschuh:

I have received your letter of December 4, 1981 requesting additional time for the Town Board to reach a decision concerning participation in the proposed Irondequoit Creek Flood Protection Project and a further meeting with representatives of the Corps of Engineers. We have advised the Corps of your request and suggested that they revise their schedule accordingly.

Members of my staff will be available to participate in any meeting which you may schedule and also arrange for participation by the Corps of Engineers. It is suggested that the meeting be scheduled for late January, 1982 and we request that you advise this office as soon as possible of the desired date for the meeting. We must receive questions to be developed by the Town Board at least two weeks prior to the meeting in order that they may be forwarded to the Corps with our comments.

This Department will take no further action concerning the proposed project until we have heard from the Town of Penfield.

Sincerely,

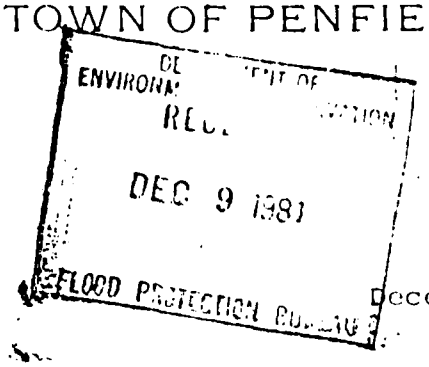
Richard L. Konsella, P.E.
Chief, Flood Control Projects Section

RLK:pt

cc: Penfield Town Board
c/o Town Clerk
Ms. Irene L. Gossin, Supervisor Elect
Buffalo District COE
Allan Buddle

TOWN OF PENFIELD

3100 Atlantic Ave
Penfield N Y 14526



December 4, 1981

Richard L. Konsella, Chief
Flood Control Projects Section
N. Y. S. Dept. of Environmental Conservation
50 Wolf Road
Albany, N. Y. 12233

Dear Mr. Konsella:

I have discussed your letter of November 24 with the Town Board and with incoming Supervisor Irene L. Gossin. The Town Board members who will be in office after January 1 and Mrs. Gossin have requested me to write and ask for an extension of time.

During the next two months the Town Board would like to compile a list of questions to obtain further information from the Corps of Engineers. The Town Board will probably wish to have either a Public Hearing or an information meeting with property owners and merchants in the Panorama area so that they can also become better informed about the project.

I enclose a clipping from the Rochester Times Union of December 2, 1981. The reporter covered a Town Board worksession at which this topic was discussed.

Sincerely,

Anna R. Bundschuh
Supervisor

ARB:bf
cc: Town Board
D. MacPherson, Corps of Engr.
I. Gossin, Supr. Elect

November 24, 1981

Ms. Anna Bundschuh
Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Dear Ms. Bundschuh:

This is with reference to my letters to you of April 21, 1981, August 27, 1981 and September 10, 1981 concerning the proposed Irondequoit Creek Flood Protection Project and requesting that the Town of Penfield provide a letter of intent to participate in the project. Eight months have passed since our meeting on April 15, 1981 and my first letter of April 21, 1981, and we have still not received an indication of the Town's position regarding the project.

In these days of reduced Federal spending, there is keen competition for funds for planning and constructing flood protection facilities. We must notify the Corps of Engineers of the position of non-Federal interests concerning the Irondequoit Creek Project. Consequently, if we have not received a letter stating the intent of the Town of Penfield to participate in the project by December 10, 1981, we will be forced to advise the Corps of Engineers that there is insufficient local interest in the project to warrant recommending the project for authorization by Congress.

Sincerely,

Richard L. Ponsella
Chief
Flood Control Projects Section

br

cc: Penfield Town Board
A. Puddle

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Robert F. Flacke
Commissioner

RF.

DIVISION OF WATER
FLOOD PROTECTION BUREAU

September 28, 1981

Colonel George P. Johnson
District Engineer
US Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

This is in interim reply to your letter of March 30, 1981, requesting that this agency provide a letter of intent to participate in a flood damage reduction project for the Irondequoit Creek Watershed. We have reviewed the Draft Final Feasibility Report and generally concur with the selected plan. We are currently awaiting the views of the Town of Penfield with regard to certain local responsibilities. When we have received indication of the views of the Town, we will be in a position to furnish the requested letter of intent.

Sincerely,

James Kelley

James F. Kelley
Chief, Flood Protection Bureau

cc: A. Buddle
A. Bundschuh
RLK/ea

DIVISION OF W TER
FLOOD PROTECTION BUREAU

September 10, 1981

Ms. nna Bundschuh
Supervisor, Town of Penfield
3100 Atlantic Avenue
Penfield, New York 14526

Dear Supervisor Bundschuh:

This is in reply to your letter of September 2, 1981, regarding the proposed Irondequoit Creek Flood Protection Project. We are unaware of any other communities which have established a special benefit district to raise funds for local costs of flood protection projects, including the annual costs of operation and maintenance. Several communities in the past have considered this alternative, but have concluded that project benefits, particularly those directly associated with commercial and industrial areas, accrue to the entire community and not just the area of direct benefit.

As stated in my letter of April 21, 1981, a letter of intent at this time does not commit the Town of Penfield to any future expenditures, but is necessary for the Corps of Engineers to seek approval to proceed with more detailed studies. However, if the Town Board does not feel that there is some likelihood of Town participation in a future project, we must notify the Corps of Engineers that there is insufficient local interest to warrant additional expenditures of Federal funds.

We would appreciate notification of the Town's position as soon as possible.

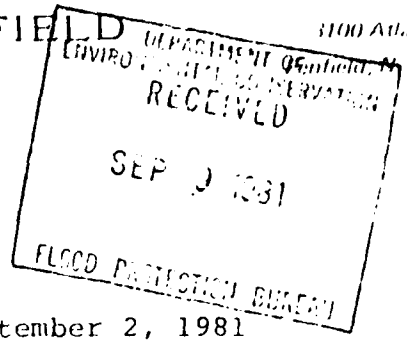
Sincerely,

Richard L. Konsella, P.E.
Chief, Flood Control Projects Section

cc. A. Buddle, w/incoming
RLK/en

TOWN OF PENFIELD

3100 Atlantic Ave.
Penfield, N.Y. 14526



September 2, 1981

Richard L. Konsella, P.E.
Chief, Flood Control Projects Section
N. Y. State Dept. of Environmental Conservation
50 Wolf Road
Albany, N. Y. 12233

Dear Mr. Konsella:

The Town Board has not made a determination as to its support of the Irondequoit Creek Watershed Study by the Corps of Engineers.

We have been considering how to best to set up a special district to pay the on-going maintenance cost of the project. Do you have any information where special districts have been used by other municipalities for similar projects? Our concern is how to do this equitably. We could base these special districts on assessed valuation but those properties furthest away from the creek are less likely to suffer damage than those closer, and should probably contribute a smaller amount towards the maintenance. This could involve a complex formula.

We would appreciate any information you might have.

Sincerely,

Anna R. Bundschuh
Supervisor

APB:bf

DIVISION OF WATER
FLOOD PROTECTION BUREAU

August 27, 1981

Ms. Anna Bundschuh
Supervisor, Town of Penfield
3100 Atlantic Avenue
Penfield, New York 14526

Dear Supervisor Bundschuh:

This is with reference to my letter to you of April 21, 1981, copy attached, requesting that you provide us with an expression of the Town of Penfield's interest in the Irondequoit Creek Watershed Study and its intent to participate in a project, if one is found to be justified. We are awaiting your response before we advise the Corps of Engineers of the State's intentions.

We would appreciate your response in this matter.

Sincerely,

Richard L. Konsella, P.E.
Chief, Flood Control Projects Section

Attachment
cc: A. Buddle, wo/attachment
RLK/ea

DIVISION OF WATER
FLOOD PROTECTION BUREAU

April 21, 1981

Ms. Anna Bundschuh
Supervisor, Town of Penfield
3100 Atlantic Avenue
Penfield, New York 14526

Dear Supervisor Bundschuh:

As we discussed during our meeting of April 15, 1981 concerning the Final Feasibility Report on the Irondequoit Creek Watershed, the Buffalo District, Corps of Engineers has requested that this Department furnish a letter of intent to participate in a local flood protection project in the vicinity of Panorama Plaza. Before we can furnish such a letter of intent, it will be necessary to receive a letter of intent from the Town of Penfield to participate in a project. Such an expression of intent does not obligate the Town or the State in any way, but is necessary to obtain Congressional authorization of the project, allowing the Corps of Engineers to proceed with detailed design of the project.

We would appreciate receiving a letter from the Town of Penfield as soon as possible after the public meeting to be held April 29, 1981. Your cooperation in this matter is appreciated.

Sincerely,

Richard L. Rousella, P.E.
Chief, Flood Control Projects Section

cc: A. Parisi
RLR:ss

NCBED-PN 30 March 1981

James Kelley, Chief
Water Management
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Kelley.

The purpose of this correspondence is to request a Letter of Intent to provide assurances from the New York State Department of Environmental Conservation for the proposed Corps of Engineers flood damage reduction project in the Irondequoit Creek Watershed.

Five copies of the Draft Final Feasibility Report (DFFR) and Draft Environmental Impact Statement (DEIS) and associated Appendices entitled "Irondequoit Creek Watershed, New York," were sent to your office under a cover letter dated 30 January 1981. The selected plan, Alternative "B" is a structural levee and floodwall plan for the Panorama Plaza area of the town of Penfield, NY.

The cost of the selected plan is subject to change during the revisions of the final report. A more detailed and realistic real estate estimate has been recently completed by our Real Estate office. The land acquisition costs were revaluated at full value and relocation costs were added resulting in a total real estate cost increase of approximately $900,000. This will result in an increase of the non-Federal cost share. The total project cost is expected to change due to a modification of the internal flood control measures. A pump station may not be necessary which would lower the cost by approximately $100,000. A cost increase of $100,000 results from an update of price levels and interest rates. A breakdown of the proposed cost changes and cost-sharing policies is presented in Inclosure 1.

A combined public meeting and Section 404 public hearing will be held 29 April 1981, at Penfield High School, Penfield, NY, to discuss the features of the selected plan. You should have received the public meeting notice, dated 27 March, with information pamphlet.

NCBED-PN
James Kelley, Chief

A reply to this letter is requested by 15 May 1981. The Letter of Intent to provide assurances will be included in the final report and EIS when it is sent forward to higher authority for authorization review.

If you have any questions pertaining to the report, please call David MacPherson, Study Manager, at (716) 876-5454, extension 2245.

Sincerely,

1 Incl
as stated

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

MacPherson_____
Kelly_____
Gilbert_____
Hallock/
Liddell_____
Braun_____
Johnson_____

Selected Plan
Alternative B - Levee/Floodwall

Summary of Costs and Benefits [1/]

Federal Cost	$3,170,000
Non-Federal Cost	620,000
Total Project Cost	3,790,000
Average Annual Benefits	$ 676,600
Average Annual Costs	345,400
Net Benefits	331,200
Benefit/Cost Ratio	1.96

1/ Based on February 1980 price level and 7-1/8 percent interest rate

Approximate Cost Revisions

	Present	Final Report	Change
Real Estate	$600,000	$1,500,000	$+900,000
Interior Flood Control	400,000	300,000	-100,000
Price Level Increase	-	-	+100,000
Total Net Change			$+900,000

Revised Total Project Cost = $4,700,000

Apportionment of Cost

	Traditional Cost Sharing	President Carter's 6 June 1978 Proposed Policy
Present Federal Cost	$3,170,000	$2,842,500
Present Non-Federal Cost	620,000	947,500
Revised Federal Cost [1/]	3,200,000	3,500,000
Revised Non-Federal Cost [1/]	1,500,000	1,200,000 [2/]

1/ Approximate, based on proposed cost revisions.

2/ President Carter's cost-sharing policy results in less non-Federal costs when traditional non-Federal costs are high.

NCBED-PD

6 May 1981

Mr. Robert A. Scott
New York State Department of
Environmental Conservation
6274 E. Avon-Lima Road
Avon, NY 14414

Dear Mr. Scott:

Reference NYSDEC letter 1 May 1981 on Subject: Review of the Draft Final Feasibility Report and Draft Environmental Impact Statement for the Irondequoit Creek Watershed.

The U.S. Army Corps of Engineers, Buffalo District recognizes the New York State Department of Environmental Conservation's concerns pertaining to review of the Report, and hereby grants an extension of review time to 15 May 1981.

Sincerely,

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PM
NCBED-PE

Smith
Bryniarski
Bennett
MacPherson
Pieczynski
Hallock/
Liddell
Braun
Johnson

SK/2175

NCBLD-PT

Sept 14, 1979

Director
Office of Federal Register
National Archives and Records Service, GSA
Washington, DC 20408

Dear Sir:

Enclosed for publication in the Federal Register are three (3) copies of a Notice of Intent to Prepare a Draft Environmental Statement for Flood Damage Reduction Measures for the Irondequoit Creek Watershed, New York.

In accordance with Council on Environmental Quality regulations on the National Environmental Protection Act, specifically 40 CFR 1501.7 and Corps of Engineers regulation ER 200-2-1 this notice has been submitted to your office for immediate publication in the Federal Register.

Sincerely,

1 Incl (trip)
as stated

THOMAS R. BRAUN
Lt Col, Corps of Engineers
Deputy District Engineer

CF:
NCBED-PE

Berkeley_____
Bennett_____
MacPherson___
Gilbert_____
Hallock/
Liddell_____
Braun_____

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-PE

31 July 1980

Mr. Paul Hamilton
U. S. Department of the Interior
Fish and Wildlife Service
100 Grange Place
Room 202
Cortland, NY 13045

Dear Mr. Hamilton:

This letter pertains to the schedules of flood control studies of Irondequoit Creek in the town of Penfield, NY, and Limestone Creek in the towns of Manlius and Pompey, NY, for which Mr. Mark Clough is the U. S. Fish and Wildlife Service representative.

In a telephone conversation of 21 July 1980 with Tod Smith of the Buffalo District Environmental Resources Section, Mr. Clough requested a 30-day extension to complete the Draft Coordination Act Report for Irondequoit Creek, originally scheduled for completion on 1 August 1980. Mutual scheduling difficulties were further discussed in a 22 July 1980 telephone conversation and a new completion date of 22 August 1980 was established. The Draft Coordination Act Report is needed by our office for incorporation into an appendix of the Corps Draft Final Feasibility Report which is scheduled for completion and forwarding to the Corps North Central Division office for review by 31 August 1980. The Final Fish and Wildlife Service Coordination Act Report is due at the Buffalo District on 1 November 1980 as scheduled.

Enclosed with this letter are the most recent modifications and developments for the selected Alternative B (Levee/Floodwall alternative) of the Irondequoit Creek Study.

With regard to the Limestone Creek Flood Control Study; due to numerous contracting, scheduling, and funding difficulties; the alternative plans for the study will not be available by 1 August 1980, as previously scheduled. This problem was discussed in the 21 July 80 telephone conversation with Mark Clough. The study status is presently unsettled. If the reservoir alternative becomes a likely solution, the study may have to be incorporated into the current Oswego River Basin Study. Alternatives will not be developed until after FY 80.

NCBED-P
Mr. Paul Hamilton

Therefore, work on the Fish and Wildlife Service second planning aid letter (previously scheduled for completion by 15 September 1980) cannot be initiated until the Corps alternatives are developed and sent to Mr. Clough. A new date for completion of alternative plans will be scheduled and forwarded to your office, at which time a revised date for completion of the second planning aid letter will be mutually determined.

Continued close coordination with your office and the Buffalo District will be maintained in these matters.

Sincerely,

1 Incl
as stated

DONALD M. LIDDELL
Chief, Engineering Division

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-PE

29 May 1980

Mr. Paul Hamilton
U.S. Department of the Interior
Fish and Wildlife Service
100 Grange Place
Room 202
Cortland, NY 13045

Dear Mr. Hamilton:

This letter pertains to the General Investigation flood control project at Irondequoit Creek in the Town of Penfield, New York.

Enclosed is the existing detailed description of the selected alternative (Alternative B Modified - Levee/Floodwall). Preliminary design plates of the selected alternative have also been sent for your review. Any significant modifications to these plans will be forwarded to you as soon as possible.

Alternative A - Without improvement (No Action) and Alternative C - Channel/ Berm were also investigated in Phase III planning. Alternative A is always investigated. However, it would not meet primary planning objectives. Also, subsequent foundations and materials investigations have determined that extensive riprap would be required to implement Alternative C. This plan was therefore eliminated for both economic and environmental reasons. A more detailed Alternative C (similar to that described in the Preliminary Feasibility Study) is being developed for comparative reasons. This description will be forwarded by June 30, 1980.

These descriptions are to be used when preparing the Fish and Wildlife Coordination Act Report, the draft of which is scheduled for completion by 1 August 1980.

Please feel free to contact us if additional clarification is necessary.

Sincerely,

Charles E. Gilbert

CHARLES E. GILBERT
Chief, Planning Branch

Incl
as stated

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-PN

30 January 1981

Enclosed for your review is a copy of the Draft Final Feasibility Report (DFFR) and Draft Environmental Impact Statement (DEIS) and associated Appendices, entitled "Irondequoit Creek Watershed, New York."

These reports have been combined into a single document and filed with the U.S. Environmental Protection Agency to be reviewed under the National Environmental Policy Act Procedures. If you have any comments on the reports, please send them to me by the date stamped on the cover page of the Draft Environmental Impact Statement.

During the first week of March 1981, an information package will be sent out informing you of a combined public meeting and Section 404 public hearing to be held at the end of April 1981.

If you have any questions pertaining to the report, call Mr. David R. MacPherson, the Study Manager, (716) 876-5454, ext. 2245.

Sincerely,

1 Incl
as stated

Lt. Col. Corps of Engineers
Deputy District Engineer

for and in the absence of

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

NCBED-PN 5 June 1980

MEMORANDUM FOR RECORD

SUBJECT: Informal Workshop Meeting - Irondequoit Creek and Allen Creek

1. Date: 4 May 1980, 10:00 a.m. - 12:30 a.m.
Location: Penfield Town Hall, Penfield, NY
Participants:

David MacPherson - Planning - COE
Anna Bandschuh - Supervisor, Penfield
Charles E. Ackerman - Director of Public Works
Sidney Lusk - Superintendent of Sanitary Sewers
Paul M. Rood - Director of Parks & Recreation
Cynthia Sommer - Monroe County Planning Department

2. An informal workshop meeting was held to discuss the selected plan for Irondequoit Creek which is to provide flood damage reduction in the Panorama Plaza area. The purpose of the meeting was to inform the town of Penfield officials of the latest design and plans to be proposed in the Draft Final Feasibility Report.

3. David MacPherson handed out a map (Incl 1) that details the proposed improvements of the selected plan, Alternative B. He also presented a detailed description of the location, size, and impacts of the proposed improvements.

4. The following major concerns and questions were expressed at the meeting:

a. Sid Luck - Will the levees cover the sewer interceptor? Yes, in portions. The manholes will be raised for maintenance access. The manholes in the area of the old abandoned pumpstation would have to be waterproofed.

b. Anna Bandschuh - Have upstream reservoirs been considered to reduce the size of the levees? Upstream reservoirs would have insufficient capacity to have a significant beneficial impact. The cost of building reservoirs would far outweigh the savings in lower levee heights.

c. Anna Bandschuh - Could vehicular access be maintained over the plaza extension bridge? It would be too costly to build a new bridge over the old bridge. The old bridge acts as a needed drop structure to slow erosive velocities. The use of the old bridge could create a potential danger to the public during flood periods.

d. Paul M. Rood - No progress has been made on developing the proposed park behind the Plaza. A bike trail would be proposed along the top of the levee. An easement along the right bank near the quarry is being obtained for a hike and bike trail. The proposed trail in the plaza area would aid in connecting Linear Park with Ellison Park.

e. Paul M. Rood - Dolomite Construction is planning on building an industrial area on the north side of Allen Creek. Panorama Creek Road would be extended across Allen Creek. There have been no formal plans submitted to date. MacPherson stated that floodplain regulations should be enforced to prevent development in the floodplain.

f. Charles Ackerman - Ponding of storm water occurs in the vicinity of Brookhill Apartments due to the backup of storm sewers. MacPherson stated that this will be relieved when the internal drainage analysis is completed.

g. Charles Ackerman - The drainage easement at the quarry lake could be obtained now because the construction company currently has a permit pending approval for facilities expansion. The real estate office will contact him. The easement would be beneficial to the town even if there was no Federal project.

5. A request was made by Ms. Anna Bandschadh that an informal public meeting be set up for the business owners and residents in the Panorama Plaza area before the report is sent out for coordination in January 1981.

David R. MacPherson

DAVID R. MACPHERSON
Study Manager

NCBED-PN 13 May 1980

MEMORANDUM FOR RECORD

SUBJECT: Field Trip to Irondequoit Creek and Allen Creek - Coordination Meeting

Date: 8 May 1980 9:30 a.m. - 1 p.m.
Location: Panorama Plaza Area, Penfield, NY
Participants: David MacPherson - Eastern Planning
Philip Frapwell - Environmental
Jack Cooper - NYSDEC
Mark Clough - USFWS

1. A meeting was held to discuss the proposed schemes for providing flood damage reduction along Allen Creek. Currently high stage floodwater overtops the banks of Allen Creek and the existing velocities are excessively erosive. The erosive velocities would endanger the flood control structures placed along the creek. This allowed only two methods of solution: (a) To allow existing velocities to flow through the channel with no channelization. However, to prevent serious erosion the channel bottom and side slopes would have to be riprapped; (b) To reduce the erosive velocities a drop structure would have to be installed to dissipate the energy. The velocities would be low enough downstream to negate the need for riprap. Allen Creek would have to be channelized at a gradient to meet the bottom of the drop. These two methods of solution were referred to by H&H and Design in developing the four schemes proposed for Allen Creek.

2. At the field trip, Scheme 3 was recommended by the Corps. A friction channel approximately 300 feet long with a 7-foot drop would be constructed along a new alignment. The remainder of the channel would not require riprap due to the lower nonerosive velocities. Channelization along the proposed alignment would meet the gradient at the bottom of the drop.

3. The following concerns were expressed by DEC and FWS.

a. Both Cooper and Clough could not understand the need to channelize a new alignment and not use the present alignment.

b. Channelization should be avoided if practical.

c. Riprap usage should be reduced.

d. A drop structure over 3 feet high would be unacceptable for fish runs.

e. A steep grade friction channel may have excessive velocities that would be unacceptable for fish runs.

f. A low flow channel should be used. The design should reduce sediment settlement into the low flow channel.

g. What would be done to prevent settling of sediment at the bottom of the drop structure or at the end of the friction channel.

h. The pools and riffle areas should not be eliminated without providing new fish habitat.

4. The recommendation of Jack Cooper and Mark Clough at the field trip was to provide two or more 3-foot drop structures, or one 3-foot drop structure with a section of friction channel. The upstream creek alignment could be straightened at the existing curve. The remainder of the channelization should be aligned along the existing meandering channel rather than along a straight alignment. A low flow channel should be incorporated in the design to allow fish migration.

5. Enclosed is a copy of the field trip memorandum from Environmental Section (Incl 1). DEC and FWS will send a letter next week detailing their recommendations.

David R. MacPherson

DAVID R. MacPHERSON
Study Manager

1 Incl
as

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
Environmental	Field Trip to Irondequait Creek to investigate Allen Creek

TO: MacPherson

FROM: Frapwell

DATE: 5/6/80

CMT 1

1. Corps personnel (MacPherson & Frapwell) met with NYS DEC (Jack Cooper) and US FWS (Mark Clough) to discuss alternatives for Allen Creek, a tributary of Irondequoit Creek.

2. Jack Cooper said DEC was against 900 ft of Straight Channelization with a 300ft of friction channel. DEC believes that Allen Creek has good potential for fishery habitat. This is based on existing Creek conditions and increasing (improving) water quality.

3. DEC & FWS want the COE to look into the possibility of modifying the existing plans to incorporate the following instead of 900 ft Straight channelization (with 300ft friction channel included within this)

   a. (2) 3ft drop structures instead of friction channel
   b. Meandoring channelization instead of straight channelization

DA FORM 1 FEB 63 2496 REPLACES DD FORM 96, WHICH IS OBSOLETE.

Incl. 1

☆ GPO-1975-665-422/1063

c. (1) 3ft drop structure & less than 300ft friction channel

d. Incorporate riffle areas, pools, deflectors or quiet areas within the creek when channelizing.

DEC believes these alternatives would be less damaging to the fisheries.

4. COE told DEC & USFWS that we would try to investigate these changes & modifications but our time schedule was rushed & short - Must get alternatives to FWS & Andy Whites field data to the Service so the FWS Coordination Act Report can be prepared on time.

5 Jack Cooper was also concerned that these alternatives of Channelization & Friction Channel could increase O&M costs due to siltation build up and debris settling out at end of friction channel - since these alternatives would reduce velocities.

6. Jack Cooper was also apprehensive about recommending a low flow channel within the friction channel due to the possibility of the low flow channel filling up due to reduced velocities + settling out of materials and thus not serving its purpose, to allow fish migrations during dry periods.

PENFIELD PRESS

Penfield N.Y.

FEB. 28 -80

CORPS OF ENGINEERS

BUFFALO DISTRICT

Our Town

By Penfield Supervisor

Anna R. Bundschuh

People in Penfield are looking forward to the annual Penfield Rotary Show to be held March 7, 8 and 9. Entitled "The Beat Goes On," the show will be accompanied by the Rotary Band.

Rotary International is celebrating its 75th Anniversary this month. The 90 member Penfield Club was founded in 1948. Its largest project is the support of Camp Haccamo, a camp for handicapped children, located behind Panorama Plaza.

Show director is Bill Pethick, and assistant director is Councilwoman Jo Fonte.

At the request of Raymond L. Keefe, County Commissioner of Physical Services, I have nominated three persons to serve on a community liaison committee for the Monroe County Project to construct a new bridge over Irondequoit Creek and to realign the Linden Avenue, Whitney Road, Bluff Drive and Five Mile Line Road intersection. They are Mark Myers, a resident of the area, Councilman John Nolan who is the Town Board's Public Safety Committee Chairman, and Planning Board member Gary Byers, who chairs the Transportation Subcommittee.

County economic development activities are being coordinated through the County Manager's Office. At the request of Manager Lucien A. Morin, I have asked Councilman Donald Milton to serve as Penfield's liaison with the county for economic development activities.

I am pleased to have been appointed to the Monroe County Water Quality Management Committee. The committee will serve as the public participation advisory group for two county studies: the Industrial Waste Pre-treatment Study and the Irondequoit Basin Urban Runoff Study. The latter project will address the problem of urban runoff and its impact on Irondequoit Creek and its tributaries, and thus is of significant concern to our town.

NCBED-PN 22 February 1980

MEMORANDUM FOR RECORD

SUBJECT: Environmental Coordination Meeting - Irondequoit Creek Stage 3 Studies

Date - 20 February 1980 - 1 p.m.
Location - USF&WS Office - Cortland, NY
Participants - David MacPherson - Corps of Engineers
Philip Frapwell - Corps of Engineers
Tod Smith - Corps of Engineers
Richard Lewis - Corps of Engineers
Jack Cooper - NYSDEC
Paul Hamilton - USF&WS
Bill Gill - USF&WS
Mark Clough - USF&WS

1. David MacPherson opened the meeting with a slide presentation and a description of the existing conditions along Irondequoit Creek in the Panorama Plaza area of Penfield, NY. The two proposed plans for the flood damage reductions were presented, Alternative B - Levee/Floodwall and Alternative C - Channelization/Berms. It was explained that the discharges are being revised and lowered by the H&H Section. The lowering of the discharges could reduce damages and benefits which could result in a lower B/C ratio for both alternatives. This action could make Alternative B economically unjustified. The Corps requested an elevation of Alternative C by USF&WS and NYSDEC representatives. Paul Hamilton stated that they would not support channelization if another justified alternative was available. Jack Cooper agreed with USF&WS's stand on the issue of channelization.

2. Channelization would be acceptable under the following conditions.

a. If it is the only feasible solution for flood damage reduction in a particular reach.

b. A low flow channel is maintained for fish migration designed on an average 10-year low flow.

c. The low flow channel should remain along the tree line for shade cover to prevent temperature increases in the stream.

d Channelization should be coordinated with NYSDEC to determine which banks should be cut. Both banks should not be removed in a particular reach.

NCBED-PN
SUBJECT: Environmental Coordination Meeting - Inondequoit Creek Stage 3 Studies

e. Leaves, berms, or floodwalls should be set behind the tree line. Their installation may reduce the amount of channnelization necessary.

3. The left bank along Irondequoit Creek between the Genesee Conservation League and the Quarry Lake is approximately 3 feet above the Creek's normal water surface. During high stages the water overtops the bank and flows into the lake. According to Jack Cooper, the quarry construction company had reinforced the bank to prevent erosion. The last field trip had indicated poured concrete on the ground. NYSDEC also requested that a wier could be installed to regulate the overflow. This overflow may reduce the flood stages in this reach and eliminate or reduce the amount of channelization or levee height required.

4. Phil Frapwell stated that the results of the fall sampling of Irondequoit Creek had not arrived to date. A telephone conversation with the Contractor indicated the project reaches were not valuable for fish spawning but had some value for fish feeding. The reach between the Rt 441 Bridge and the Panorama Trail Bridge has several ripple areas valuable for feeding. The remainder of the project reach has slow moving water and is valuable only as a resting area for any fish migration upstream.

5. Enclosed is the alternative proposed by USF&WS and NYSDEC, which is a combination and alteration of Alternatives B and C.

6. Attached to this summary are comments from the Environmental Section on the conclusions presented at the meeting.

David R. MacPherson

2 Incl
as

DAVID R. MACPHERSON
Study Manager

NCBED-PE 20 February 1980

MEMORANDUM FOR RECORD

SUBJECT: Meeting with U.S. Fish & Wildlife Service USF&WS and New York State Department of Environmental Conservation (NYSDEC) concerning Irondequoit Creek.

1. USF&WS & NYSDEC presented their views as to what modifications and alternatives should be investigated to help relieve the flooding problem on Irondequoit Creek and also reduce the impact on existing natural resources. The following is a summary of suggestions brought to COD attention:

a. Investigation should be made to determine if a high-flow diversion channel could be constructed thru Quarry Lake. This would involve installing an entrance and exit channel for high discnarges, so as not to significantly change the quarry water level, but would possibly allow less back water effect on the creek.

b. A suggestion was made to review alternative G (nonstructural) and determine if any combination of non-structural plans could be utilized to reduce damages (see Attachment 1).

c. Fish & Wildlife & NYSDEC both favored the Levee/Floodwall Plan because it is less damaging to the environment than the Channel/Berm Plan. The project manager indicated the Levee/Floodwall Plan may have a B/C ratio less than one due to revised flow data and new damage estimates USF&WS & NYSDEC then suggested certain modifications to the existing alternatives to improve the B/C ratio while minimizing channelization.

These suggestions NYSDEC & USF&WS were based on the premise that the further the flood control structures are placed from the creek bank, the smaller the structures required, because the flood plain can be used more effectively. Reducing the size of the structures can reduce project costs. NYSDEC & USF&WS suggested that berms replace some levees and increase the utilization of the flood plain. This may reduce the height of floodwalls, which are expensive to construct.

The following modifications, suggested at the meeting are shown on the attached map, and are outlined as follows:

(1) Set back levees to open corridor between Rt 441 & Panorama Bridge; no channelization in this Rt 441 stretch at all.

(2) Panorama Bridge to Penfield Road Bridge - install berms on east bank surrounding proposed recreation fields. This would increase the area for overbank flooding which would probably cause only minor damage to the environment. This may reduce the height of the floodwalls on the west bank.

NCBED-PE
SUBJECT: Meeting with U.S. Fish & Wildlife Service (USF&WS) and New York State Department of Environmental Conservation (NYSDEC) concerning Irondequoit Creek.

(3) Investigate the potential for modifying the confluence of Allen and Irondequoit Creeks. This may involve a slight straightening of Allen Creek to allow for less restrictive flows into Irondequoit Creek.

(4) The area from Allen Creek to the Penfield Road Bridge was considered to be the only area acceptable for some channelization. Channelization would only be considered after all these other modifications were looked at separately or in combinations thereof. Channelization would necessitate more detailed site specific investigation by both the USF&WS & NYSDEC.

(5) Consideration by COE to lower the project to the 100-year flood protection level.

2. USF&WS & NYSDEC were opposed to channelization for the following reasons:

a. Channelization could cause increased temperatures in the creek. This may cause a temperature barrier to be formed, preventing fish migrations.

b. Existing riparian vegetation (overhanging shade trees & shrubs) would be destroyed.

c. Channelization could cause detrimental low water depths to develop in the creek during seasonal low flow periods.

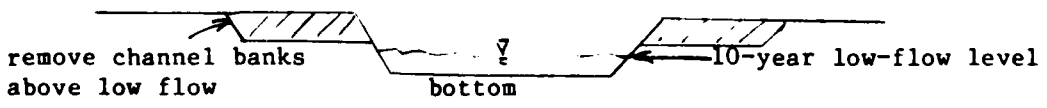
d. NYSDEC indicated that there is a probability that the project area is used by salmonid smolts (juvenile fish) and, that this habitat could be reduced in usefulness to smolts if existing conditions are altered by channelization.

3. NYSDEC suggested the following modifications if channelization had to be implemented:

a. Construct log-cribs to allow for overhanging banks.

b. Alternate channelization to the creek banks.

c. Use average 10-year low-flow data and, don't channelize or disturb the creek bottom below this water level.



NCBED-PE
SUBJECT: Meeting with U.S. Fish & Wildlife Service (USF&WS) and New York State Department of Environmental Conservation (NYSDEC) concerning Irondequoit Creek.

4. The projected futures of the creek were presented by NYSDEC.

a. Water quality is expected to increase due to new sewer lines & town ordinances.

b. Existing wildlife habitat & riparian vegetation will increase in importance due to increased development in the area.

c. The fisheries in the area are expected to improve with increasing water quality. The creek will not continue to be stocked with either brown or rainbow trout in the near future. NYSDEC is waiting to see if existing populations will expand their range and increase in numbers naturally.

5. Opinions of NYSDEC & USF&WS are that these alternatives or combinations thereof should be investigated to the fullest extent, before channelization is considered as a flood relief measure.

1 Incl
as

LEONARD BRYNIARSKI

TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE: 12 May 1980

SUBJECT OF CONVERSATION

Comments of the Interageny Archaeological Service on the Irondequoit Creek Cultural Resources Report by Francis J.Clune

INCOMING CALL

PERSON CALLING	ADDRESS	PHONE NUMBER AND EXTENSION

PERSON CALLED	OFFICE	PHONE NUMBER AND EXTENSION

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
Richard H.Lewis	NCBED-PE	FTS 473-2175

PERSON CALLED	ADDRESS	PHONE NUMBER AND EXTENSION
James W.Thomson	IAS-Atlanta	FTS 221-2633

SUMMARY OF CONVERSATION

Mr. Thomson was called regarding the 9May 1980 letter from the IAS-Atlanta Office regarding the Cultural Resources Survey of Irondequoit Creek prepared for the Buffalo District by Francis J.Clune. He was informed that we agreed that the quality of the report was questionable,however additional feild work,performed by the District Staff and coordination of this work with the New York State Historic Preservation Office had confirmed the findings of the report. Mr. Thomson agreed that if the SHPO had accepted the findings of the report that IAS would be agreeable to accepting it also. Mr. Thomson was then requested to review the entire coordination proceedure and to make any additional comments that were necessary when the Draft Environmental Impact Statement was circulated for comment.

Richard H.Lewis
Archaeologist
Environmental Resources Section

DA FORM 1 APR 66 751 REPLACES EDITION OF 1 FEB 58 WHICH WILL BE USED.

☆ U.S. GPO: 1974-580-839/8125

NCBED-PN

15 February 1980

Genesee Conservation League
Old Penfield Road
Penfield, NY 14526

Returned sent to Mr Wayne Garr ? Genesee Conservation League 220 Powers Building Rochester, New York

Gentlemen:

As you know, we are currently studying the feasibility of constructing a Federal project to reduce flood damages in the Panorama Plaza reach of Irondequoit Creek. During a prior public meeting held in August 1979, several members of your club expressed a need for flood protection of the Genesee Conservation League's property.

To assist our investigation, please answer the following questions to the best of your knowledge and return the answers to our office.

1. During the past 20 years, when did you experience the most extensive flooding? Mark the flooding limits on the enclosed map.

2. What has been the approximate dollar amount of damage incurred during each flood event?

3. What has been the extent of the flood damage? (Type and location.)

4. Do you experience yearly flooding?

5. How many members are actively enrolled in the Genesee Conservation League?

6. Are there any plans for future changes to your facility?

Thank you for your cooperation. If you have any questions concerning this study, please contact Mr. David MacPherson, Study Manager, (716) 876-5454, extension 2245.

Sincerely,

1 Incl
as stated

CHARLES E. GILBERT
Chief, Planning Branch

CF:
NCBED-PN

MacPherson____
Kelly____
Gilbert____

NCBED-PN 31 March 19??

Mr. David W. Curtis
Planning and Zoning Officer
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Dear Mr. Curtis:

In reference to your letter dated 24 March 1980, I wish to thank you for advising me of the application of James Welch Assoc. for development of a shopping plaza at Panorama Trail South and Route 441.

We do not have any adverse comments regarding this proposed development. The developers have utilized flood plain management techniques effectively. The proposed development is located in an area that has topography above the Standard Project Flood stage elevation. Also, the excessive internal drainage flow induced by the development is proposed to be retained in a retention basin and released at a controlled rate.

The proposed development should have no impact upon the Corps investigations or upon downstream flood plains.

Thank you for keeping us informed of new developments within the Ironclad Creek Watershed that could impact upon our current feasibility study.

Sincerely,

CHARLES E. GILBERT
Chief, Planning Branch

CF:
✓NCBED-PN

MacPherson ____
Kelly ____
Gilbert ____
Hallock/Liddell ____

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-PE

12 June 1980

Mr. Paul Hamilton
U.S. Department of the Interior
Fish and Wildlife Service
100 Grange Place, Room 202
Cortland, NY 13045

Dear Mr. Hamilton:

This letter pertains to the General Investigation study of the flood damage reduction project at Irondequoit Creek in the town of Penfield, New York.

Enclosed is a detailed description of the Alternative C - Channel/Berm plan, for your use, in accordance with a previous letter dated 29 May 1980. Preliminary Corps studies (Stage I & II) had identified Alternative C as the National Economic Development Plan (NED). Subsequent soils investigations however, have determined that substantial erosion protection measures would be required to implement this plan, thereby significantly increasing the cost of its construction. This plan has been eliminated early in Stage III planning for both economic and environmental reasons, but has been further developed through Stage III planning primarily for comparative reasons.

This alternative (description) is to be included in preparing the Fish and Wildlife Coordination Act Report, the draft of which is scheduled for completion by 1 August 1980.

Sincerely,

1 Incl
as stated

CHARLES E. GILBERT
Chief, Planning Branch

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
NCBED-PE	Meeting with USFWS & NYSDEC in Cortland, NY on Irondequoit Creek

~~VIA~~ THRU:	FROM	DATE	CMT 1
Len Bryniarski Jim Bennett Tom Pieczynski	Phil Frapwell Tod Smith Rich Lewis	25 Feb. 80	

TO:
Dave MacPherson, Proj. Mgr.

1. Existing alternative plans were discussed with the above mentioned Federal & State agencies on 20 Feb. 80. Present from COE were Mssrs. Frapwell, Smith, Lewis and MacPherson. The meeting was held at the Cortland, NY FWS office.

2. Attached is a narrative together with maps depicting suggested modifications brought to COE attention during that meeting, based on the alternatives presented.

3. This memo is provided as a planning aid for consideration by the project manager in formulating alternatives in EQ planning.

DA FORM 1 FEB 61 2496 REPLACES DD FORM 96, WHICH IS OBSOLETE.

DEPARTMENT OF THE ARMY

NOTICE OF INTENT

To prepare a Draft Environmental Impact Statement (DEIS) for a flood control project located along Irondequoit Creek, Monroe County, NY.

Agency: U. S. Army Corps of Engineers, Buffalo District, DOD.

Action: Notice of Intent to prepare a Draft Environmental Impact Statement (DEIS).

Proposed Action: The proposed action would provide necessary flood damage reduction for the Panorama Plaza area bordering Irondequoit Creek. Nonstructural measures would also be considered for reducing flood damage throughout the watershed.

Alternatives Considered: The following alternatives for flood relief are being considered.

a. Alternative A is a plan of no action. Under this alternative, flooding problems would continue to exist.

b. Alternative B would provide flood damage reduction for the Panorama Plaza area through a combination of levees and floodwalls. Structural measures would be built along approximately 4,300 feet of Irondequoit Creek as well as 1,000 feet of a major tributary, Allen Creek. In addition, two little-used bridges would be removed.

c. Alternative C, for the Panorama Plaza area, utilizes both channel and berm improvements. Approximately 9,000 feet of Irondequoit Creek would be

widened and deepened while berms would be constructed parallel to approximately 4,300 feet of the creek to protect Panorama Plaza and a small factory complex. In addition, two little-used bridges would be removed.

d. Alternative D is an attempt to reduce flooding problems through a basin-wide management plan. Nonstructural measures which could be incorporated in this plan include flood warning, floodproofing, evacuation, flood insurance, and flood plain regulations.

Public Involvement: A public meeting to discuss the issues at hand was held on 21 August 1979. No objections to any specific elements of the study were raised. Public coordination will be maintained throughout the future planning of the study by holding study workshops and public meetings.

Issues: Significant issues to be analyzed in the DEIS will include a determination of the extent, in degree and kind, to which the Selected Plan and any reasonable alternatives might positively or negatively impact upon the human and natural environments, to include fish and wildlife habitat areas, plants, water quality, aesthetic quality of the area, cultural resources, and the equitable distribution and stability of income.

Scoping: The scoping of significant issues has been an on going process which has involved meetings with the U. S. Fish and Wildlife Service and the New York Department of Environmental Conservation. After the conclusion of planned environmental studies of the project area, future meetings will be scheduled.

Availability: This Draft Environmental Impact Statement will be made available to the public on or about 31 December 1980.

Address: Questions about the proposed action and DEIS can be answered by Philip E. Berkeley, U. S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY 14207, (716) 876-5454.

Dated: _____

THOMAS R. BRAUN
Lt Col, Corps of Engineers
Deputy District Engineer

NCBED-PN 28 November 1979

Mr. Sid Lusk
Water Department
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Dear Mr. Lusk:

On 23 November 1979, Mr. David MacPherson of our Planning Branch contacted you with regard to the status of the abandoned treatment plant buildings along Irondequoit Creek in the Panorama Plaza area.

The Buffalo District Corps of Engineers is currently investigating the feasibility of providing flood-damage reduction measures in the Panorama Plaza area of the Irondequoit Creek watershed. With construction of any of the considered structural alternatives, natural drainage to Irondequoit Creek would be either hindered or obstructed completely. The amount of land needing to be drained would be approximately 744 acres. The internal drainage would be collected by ditches along the backside (side away from the creek) of the considered berm, levee, or floodwall, paralleling the creek. A collection point would be located in the vicinity of the abandoned treatment plant. The buildings could be used to house pumps that would be used to convey the storm water over or through the improvement into the creek.

It is requested that the abandoned treatment plant buildings in the Panorama Plaza area be preserved by the town of Penfield. The use of the structures in the future would lower the total first cost of the project.

Thank you for your assistance. Please inform us of the Town Board's decision in this matter.

Sincerely,

KENNETH R. HALLOCK
Acting Chief, Engineering Division

CF:
✓ NCBED-PN

MacPherson____
Kelly____
Gilbert____
Hallock____

Dave MacPherson - Planning

CORPS OF ENGINEERS

BUFFALO DISTRICT

PENFIELD
POST-REPUBLICAN
Pittsford, N.Y.
AUG. 23-79

New Flood Ordinance Proposed in Penfield

A public hearing on a proposed floodplain ordinance for the Town of Penfield will be held in town hall Monday, Sept. 17.

The proposed ordinance would give the planning board the authority to grant a floodplain permit after a public hearing.

The town board, either individually or as a body, would have ample opportunity to send comments of recommendations to the planning board, and any questions of policy would be referred to it by the planning board prior to making a decision under the ordinance.

This proposed procedure would remove much of the present duplication of effort on the part of boards staff, and applicants," councilwoman Anna Bundschuh said.

The floodplain ordinance particularly affects the Panorama Plaza area," Mrs. Bundschuh says, "because of the already intensive development of the area and its vulnerability to flood damage. The board has discussed alternatives such as no new development within the 500-year flood zone, but believes that it is reasonable to be most restrictive in the floodway where development would be prohibited, and less restrictive as distance from the floodway increases," she said.

"The intent of having a floodplain ordinance is not only to enable Penfield property owners to continue to qualify for flood insurance, but to reduce flood damage by setting standards for construction such as flood proofing, siting buildings so as to offer the minimum obstruction to the flow of waters, etc.,". Mrs. Bundschuh continued.

Copies of the proposed ordinance will be available from the town clerk's office by the end of August.

The town board decided in June of this year, after a series of public information meetings on the new proposed zoning ordinacne, that it would review and bring to public hearing individual segments of the ordinance. The floodplain ordinance is the first segment.

Mrs. Bundschuh said the town board has reviewed the wetlands section of the proposed zoning ordinance.

"This segment is not ready for hearing or adoption because towns are not authorized to administer a wetlands ordinance until final wetlands maps have been filed by the Department of Environmental Conservation. Filing of these maps needs to be preceded by state legislative action on sections of the New York State Wetlands Law dealing with classification and procedural regulations." Mrs. Bundschuh said.

Additional sections of the new Penfield zoning ordinance will be scheduled for public hearing prior to the end of the year, Mrs. Bundschuh said.

The town board is being assisted in its ordinance review by Alan Bernstein, planning board chairman; Beth Gibson, zoning board chairman; Paul Johnson, Monroe Cunty Planning Dept. consultant; and David Curtis, clerk to the planning and zoning boards.

D MacPherson

DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS

PUBLIC HEARING

IRONDEQUOIT CREEK WATERSHED

7:30 P.M.

Tuesday, August 21, 1979

Penfield High School
High School Drive
Penfield, New York

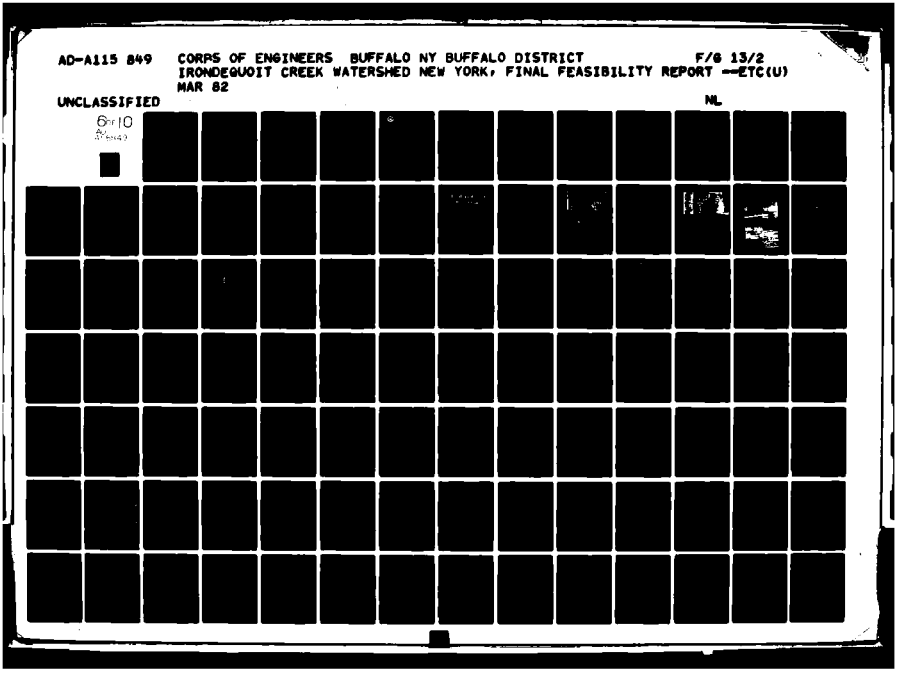
APPEARANCES:

LT. COLONEL THOMAS BRAUN
Corps of Engineers
Department of Army
U. S. Army District Deputy
Engineer
1776 Niagara Street
Buffalo, New York 14207

V. M. Scott & Associates
REGISTERED PROFESSIONAL REPORTERS
1476 DAVENPORT AVE
CLEVELAND, OHIO
(216) 621-1004

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL



P A N E L

MR. CHARLES GILBERT
Chief of the Planning Branch

MR. DANIEL KELLY
Chief of the Eastern Basin of the Planning Branch

MR. DAVID MacPHERSON
Study Manager

MR. LARRY SHERMAN
Hydraulics Section

MR. PHILIP BERKELEY
Environmental Section

MR. RICHARD BROUSSARD
Public Affairs Office

---o0o---

A T T E N D E E S

CONSTANTINE N. TONIAS
Erdman, Anthony, Associates
242 Andrews Street
Rochester, New York

MARGARET HESSION
Penfield Planning Board
30 Phaeton Drive
Penfield, New York

ALLAN R. DONK
Perington Conservation Board
1818 Tera Hill Road
Fairport, New York

JOHN J. NOLAN
31 Aspen Drive
Rochester, New York

DEMETRIOS E. TONIAS
7172 Lane Road
Victor, New York

GEORGE B. GARDNER
Brighton Planning Board, Chairman
426 Clover Hills Drive
Rochester, New York

PETER D. HUDAK
Henrietta Engineering Department
475 Calkins Road
Rochester, New York

LYNNE PIKE
Monroe County Department of Public Works
350 East Henrietta Road
Rochester, New York

JOSEPH L. CARR
Hershey Malone & Associates
2480 Browncraft Boulevard
Rochester, New York

FRANK J. KELLER
New York State, D.E.C.
Avon, New York

A T T E N D E E S (Cont'd)

RICHARD O. WILES
2300 Elmwood Avenue
Brighton, New York

IRENE GOSSIN
17 Parkview Drive
Rochester, New York

ANNA BUNDSCHUH
Councilman of Penfield
40 Cobbles Drive
Penfield, New York

DONALD S. MILTON
Councilman of Penfield
2414 Browncraft Road
Rochester, New York

WAYNE HARRIS
Genesee Conservation League
220 Powers Building
Rochester, New York

WILLIAM C. HUTCHINSON
Monroe County Conservation Council
7755 Main Street
Fishers, New York

WILFRED J. LINDNER
Genesee Conservation League
109 Edgeland Street
Rochester, New York

GREG LESTINA
Penfield Conservation Board
42 Alta Vista Drive
Rochester, New York

ELIAS C. TONIAS
Erdman, Anthony, Associates
242 Andrews Street
Rochester, New York

GARY W. RUSSELL
Monroe County Parks Department
351 Westfall Road
New York, New York

A T T E N D E E S (Cont'd)

JOHN LAMB
Monroe County Planning Department
39 West Main Street
Rochester, New York

---o0o---

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-PN

3 August 1979

IMPORTANT: DATE CHANGE FOR PUBLIC MEETING - IRONDEQUOIT CREEK

Dear Participant:

The Buffalo District, Corps of Engineers, has changed the date for a public meeting on Irondequoit Creek from Wednesday, 15 August 1979, to Tuesday, 21 August 1979, at 7:30 p.m. The meeting location will remain the same - Penfield High School, High School Drive, Penfield, New York 14526.

The date change was necessary to reduce schedule conflicts and allow more public officials the opportunity to attend. I encourage everyone to attend the meeting to review and discuss the results of the Corps flood damage reduction studies of the Irondequoit Creek Watershed.

Copies of the report are available for your review at the Corps Bufalo District Office and at the local municipality offices within the watershed. If you require further information, please call Mr. David R. MacPherson, Study Manager, at (716) 876-5454, ext. 2245.

Sincerely,

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

Dave MacPherson

CORPS OF ENGINEERS BUFFALO DISTRICT

PENFIELD POST REPUBLICAN, Pittsford, NY
16 August 79

Your Town

By Irene Gossin
Town Supervisor

It will be a long time before we see a Penfield event that will match the tremendous parade mounted by the Penfield Fire Co. last Saturday.

The Four Corners accommodated the celebration very well, much to the surprise of many who wondered if the space would be adequate, and it certainly appeared that the thousands of Penfielders enjoyed the event hugely. The fire company and Sid Ludwig, general chairman, should take a deep bow for a spectacular, well run show which celebrated 50 years of devoted service to the town.

A very special touch was the appearance in the parade of the Penfield Senior League All-Stars, winners of the State Senior Little League Championship.

All in all it was a great day for the Town of Penfield.

The Corps of Engineers Preliminary Feasibility Report for the reduction of flood damages in the Irondequoit Creek Watershed will be discussed at a public meeting next Tuesday, Aug. 21, at 7:30 p.m. at Penfield High School.

The Irondequoit Creek watershed is located in three counties – Monroe, Ontario, and Wayne. It drains 139 square miles including much of the Towns of Penfield, Perinton, Pittsford, Brighton, Henrietta, Mendon, Victor, West Bloomfield, and a small section of Macedon.

It has a recorded history of flooding for more than 100 years with the area of Panorama Plaza in the Town of Penfield most severely affected. From a flood damage survey completed in 1977 by the Corps, a total of 76 commercial businesses, 24 residences, and five public utilities may be affected by the flood exceeding a 25-year frequency.

For the record, the severe flood of 1974 was less than a 25-year flood.

A 100 year flood (which can happen much more frequently) would fill Sybron Lake, all of Panorama Plaza, most of the Brook Hill and Penfield Park apartments and almost all the businesses across from the Plaza on Old Penfield Rd.

A Standard Project Flood (500 year) would flood all the above plus all the area generally around the Tops Super Market and all the area from Panorama Trail westerly to the foot of the hill leading to Lost Mountain Manor.

An earlier report by the Corps showed standard project flood depths at the Panorama Theatre rising nearly seven feet to the tops of the theater doors, while the 100 year flood depths at the same location would reach two feet.

D MacPherson

SK/2245

NCBED-PN

26 February 1980

Anna R. Bundschuh, Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Dear Ms. Bundschuh:

In reference to your letter dated 13 February 1980, I wish to thank you for advising me of the application of Dolomite Products Company for renewal of a Commercial Excavation permit. We do have an interest in the matter, but the Corps of Engineers would have jurisdiction only if there was a proposal to directly alter Irondequoit Creek.

There are several considerations that should be noted in your evaluation of the application. They are as follows:

a. A buffer zone could be maintained along Irondequoit Creek to reduce alteration to the existing habitat.

b. Existing drainage conditions of the pond are sketchy. There are no details on the inflow and outflow controls on the lake. There are no details on the minimum and maximum water levels to be maintained in the pond.

c. The impact of development within the flood plain should be reduced by implementing current flood plain management regulations.

d. Excess drainage flows induced from future development should be retained in the pond and then released at a rate equal to the drainage runoff for existing conditions.

Thank you for keeping us informed of new developments within the Irondequoit Creek Watershed that could impact upon our current feasibility study.

Sincerely,

CHARLES E. GILBERT
Chief, Planning Branch

CF:
NCBED-PN

MacPherson___
Kelly_____
Gilbert_____
Hallock_____

SK/2245

NCBED-PN

20 July 1979

I am pleased to furnish you a copy of the Buffalo District's Preliminary Feasibility Report dated July 1979, for flood damage reduction measures in the Irondequoit Creek Watershed, NY. Also enclosed is an information package, for a public meeting to be held 15 August 1979 concerning the Irondequoit Creek Watershed study. I encourage you or your representative to attend and participate in this important meeting.

Questions raised at the public meeting and written comments received by 14 September will be carefully considered in the preparation of the Final Feasibility Report.

If you have any questions on the report, call Mr. David R. MacPherson, the Study Manager, (716) 876-5454.

Sincerely yours,

2 Incl
as stated

DONALD M. LIDDELL
Chief, Engineering Division

CF:
✓ NCBED-PN

MacPherson___
Kelly_____
Hallock/
Liddell_____

Honorable Jacob K. Javits
U. S. Senate
Washington, DC 20510

Honorable Daniel P. Moynihan
U. S. Senate
Washington, DC 20510

Honorable Barber B. Conable, Jr.
House of Representatives
Washington, DC 20515

Honorable Gary A. Lee
House of Representatives
Washington, DC 20515

Honorable Frank Horton
House of Representatives
Washington, DC 20515

Honorable Hugh Carey
Governor, State of New York
State Capitol Building
Albany, NY 12224

Honorable Frederick L. Warder
52nd Senate District
100 Lewis Street
Geneva, NY 14451

Honorable John D. Perry
53rd Senate District
181 Lafayette Pkwy.
Rochester, NY 14625

Honorable Audre T. Cooke
132nd Assembly District
347 Cobbs Hill Drive
Rochester, NY 14610

Honorable James F. Nagle
135th Assembly District
801 Main Street
E. Rochester, NY 14445

Paul P. Hamilton, Supervisor
Fish & Wildlife Service
100 Grange Place, Room 202
Cortland, NY 13045

John Ziegler, Regional Director
Federal Insurance Administrator
26 Federal Plaza
New York, NY 10007

Mr. William B. Cannon
Asst. District Chief-Water Res. Div.
U. S. Geological Survey
Post Office Box 1350
Albany, NY 12201

Thomas McDonald, Administrator
NYS Clearinghouse
NYS Division of Budget
State Capitol
Albany, NY 12224

Commissioner
NYS Dept. of Transportation
State Campus
1220 Washington Avenue
Albany, NY 12232

Orin Lehman, Commissioner
Office of Parks & Recreation
Agency Building 1
Empire State Plaza
Albany, NY 12238

Mr. Ken Foley
Monroe County Conservation Council
2210 St. Paul Street
Rochester, NY 14621

Calvin Reynolds, Director
Monroe County Parks Dept.
375 Westfall Road
Rochester, NY 14620

Robert Flacke, Commissioner
NYS Dept. Environmental Conservation
50 Wolf Road
Albany, NY 12233

Director, Region 4
NYS Dept. of Transportation
1530 Jefferson Road
Rochester, NY 14623

Richard Wiles, Supervisor
Town of Brighton
2300 Elmwood Avenue
Rochester, NY 14618

George Gardner, Chairman
Town of Brighton Planning Board
426 Clover Hills Drive
Rochester, NY 14618

State University of New York
at Buffalo
Center for Policy Studies
240 Crosby Hall
Buffalo, NY 14214

Computerized Data for Prof Funding
244 Sheridan Avenue
Albany, NY 12210

League of Women Voters
c/o Peg Fargo
121 North Fitzhugh Street
Rochester, NY 14614

Bennie Keel, Chief
Inter Agency Archeological Services
1830 Phoenix Blvd.
Atlanta, GA 30343

State University of New York
at Buffalo
Regional Economic Assistance Center
328 Crosby Hall
Buffalo, NY 14214

Deputy Regional Director
Northeast Regional Office
Bureau of Outdoor Recreation
600 Arch Street
Philadelphia, PA 19106

Regional Administrator
Region II, USEPA
26 Federal Plaza, Room 1009
New York, NY 10007

State Conservationist
U. S. Soil Conservation Service
771 U. S. Courthouse & Federal Bldg.
100 S. Clinton Street
Syracuse, NY 13250

Mr. Bob Evans
Dept. of Public Works, Brighton
2300 Elmwood Avenue
Rochester, NY 14623

Mr. Bill Fore
Henrietta Engineering Dept.
475 Calkins Road
Henrietta, NY 14467

Mr. Ronald Schroeder
Comm. for Cons. of Environment
475 Calkins Road
Henrietta, NY 14467

Mr. Rich Bolte
Monroe County Public Works
350 E. Henrietta Road
Rochester, NY 14620

Mr. Robert M. Barrows
Director of Planning
Ontario County
120 North Main Street
Canandaigua, NY 14424

Genesee Finger Lakes
Regional Planning Council
33 S. Washington Street
Rochester, NY 14608

Gary Shirley, Bldg. Inspector
Town of Brighton
2300 Elmwood Avenue
Rochester, NY 14618

Mr. Henry Corneles
Henrietta Engineering Dept.
475 Calkins Road
Henrietta, NY 14467

Supervisor, Town of Irondequoit
Town Hall
Irondequoit, NY 14617

Roberta Barnes, Supervisor
Town of Mendon
9 N. Main Street
Honeoye Falls, NY 14472

Mr. Lucien Morin
Monroe County Manager
110 County Office Building
Rochester, NY 14614

Monroe County Environmental
Management Council
405 County Office Building
Rochester, NY 14614

Jay Baker, District Conser.
Monroe County Soil and Water
Conservation District
249 Highland Avenue
Rochester, NY 14620

Edward D. Holmes, Regional Supervisor
Region 8, Dept. of Environmental
Conservation
P.O. Box 57 - Rt. 20
Avon, NY 14414

Robert Tylock, Planning Engineer
NYS Dept. of Transportation
1530 Jefferson Road
Rochester, NY 14623

Don B. Martin, Director
Monroe County Planning Dept.
301 County Office Building
39 West Main St., Rm. 301
Rochester, NY 14620

Mr. John Davis
Monroe County Division of
Pure Waters
Room 100
65 Broad Street
Rochester, NY 14604

Mr. Gene Mozzola
Monroe County Legislator
630 Portland Avenue
Rochester, NY 14621

John Hicks, Chairman
Ontario County Board of Supervisors
120 N. Main Street
Canandaigua, NY 14424

John Steele, Planning Director
Wayne County
9 Pearl Street
Lyons, NY 14489

Supervisor
Town of West Bloomfield
RD 2
Holcomb, NY 14469

Supervisor
Town Hall
Town of Macedon, NY 14502

Mr. Kenneth P. Allen, P.E.
Erdman, Anthony, Associates
242 Andrews Street
Rochester, NY 14604

R. S. Atkinson, Editor
The Link
Center for Environmental Information
33 South Washington Street
Rochester, NY 14626

Chairman
Sierra Club of Rochester
37 S. Washington Street
Rochester, NY 14614

Ms. Lois Tubbs
W. Bloomfield Wetlands Comm.
8992 Main Road
W. Bloomfield, NY 14585

Mr. Walter Kenyon
Macedon Planning Board
3010 Kittering Road
Macedon, NY 14502

Mr. William C. Larsen, P.E.
44 Saginaw Drive
Rochester, NY 14623

Mr. C. Bergman & Mr. N. Bergman
597 Concord Drive
Webster, NY 14580

Alen Vaala, Chairman
Mendon Conservation Board
Masonic Temple Building
Honeoye Falls, NY 14472

Mr. Charles Frank
Comm. of Public Works
1280 Titus Avenue
Rochester, NY 14614

Mr. Richard Burton
Monroe County Health Dept.
111 Westfall Road
Rochester, NY 14620

Neil Harkenrider, Chairman
Ontario County Planning Board
120 North Main Street
Canandaigua, NY 14424

Mr. John Blaird
Comm. of Public Works, Brighton
2300 Elmwood Avenue
Rochester, NY 14624

John Kelly, Supervisor
Town of Henrietta
475 Calkins Road
Henrietta, NY 14467

Mr. Albert Scardetta
Planning Board Chairman
475 Calkins Road
Henrietta, NY 14467

Richard Dormail, Chairman
Irondequoit Planning Board
1280 Titus Avenue
Rochester, NY 14614

James Clark, Chairman
Mendon Planning Board
Masonic Temple Building
Honeoye Falls, NY 14472

Bruce Vanderwater, Chairman
Victor Conservation Advisory Coun.
85 E. Main Street
Victor, NY 14564

Mr. Michael Corrigan
W. Bloomfield Wetlands Comm.
9040 Main Road
W. Bloomfield, NY 14585

Mr. Elias C. Tonias, P.E.
Erdman, Anthony, Associates
242 Andrews Street
Rochester, NY 14604

Mr. Howard M. Shapiro
Lozier Architects Engineers
50 Chestnut Plaza
Rochester, NY 14604

Schuyler Baldwin, Chairman
Perinton Planning Board
31 So. Main Street
Fairport, NY 14450

Honorable David Shepherd
Mayor, Village of Pittsford
21 No. Main Street
Pittsford, NY 14534

Edwin Haas, Chairman
Pittsford Planning Board
11 So. Main Street
Pittsford, NY 14534

Honorable Thomas Ryan
Mayor, City of Rochester
City Hall
Rochester, NY 14614

Alfred Dezio, Chairman
East Rochester Planning Board
314 Main Street
East Rochester, NY 14445

Fairport Planning Board
31 S. Main Street
Fairport, NY 14450

Mr. Robert Berger
Perinton Dept. of Public Works
31 So. Main Street
Fairport, NY 14450

Paul Spiegel, Supervisor
Town of Pittsford
11 So. Main Street
Pittsford, NY 14534

Mr. Philip Packard
Pittsford Planning Board
21 No. Main Street
Pittsford, NY 14534

John Spoelhof, Director
City Planning Bureau
City of Rochester
34 Broad Street
Rochester, NY 14614

Mr. Jim Trybalski
Monroe County Parks Dept.
375 Westfall Road
Rochester, NY 14620

Chairman
Conservation Advisory Council
226 Powers Bldg.
Rochester, NY 14614

Ms. Elinor Osborn
Town of Penfield Conservation Bd.
Penfield Town Hall
3100 Atlantic Avenue
Penfield, NY 14526

Mr. Armand Pizzingrilli
Supt. of Public Works
Village of East Rochester
120 W. Commercial Street
E. Rochester, NY 14445

Lake Edwards, Supervisor
Town of Perinton
31 So. Main Street
Fairport, NY 14450

George Keene, Chairman
Perinton Conservation Board
31 So. Main Street
Fairport, NY 14450

Mr. Alfred Castle
Pittsford Dept. of Public Works
11 So. Main Street
Pittsford, NY 13534

John Fish, Chairman
Pittsford Conservation Board
11 So. Main Street
Pittsford, NY 14534

Honorable Anthony Della Pietra
Mayor, Village of East Rochester
314 Main Street
East Rochester, NY 14445

Honorable Peter McDonough
Mayor, Village of Fairport
31 S. Main Street
Fairport, NY 14450

NCBED-PN 19 July 1979

Dear Participant:

The Buffalo District, Corps of Engineers, will hold a Public Meeting on Wednesday, 15 August 1979, at 7:30 p.m. to review and discuss the results of the Corps flood damage reduction studies of the Irondequoit Creek Watershed. The meeting will be held at Penfield High School, High School Drive, Penfield, NY 14526. The enclosed map indicates the meeting location (Inclosure 1).

Inclosure 2 outlines the format and agenda for the meeting. Inclosure 3 describes the public's role in the study process. Inclosure 4 is an information packet that summarizes the results of the Irondequoit Creek Watershed, NY., Preliminary Feasibility Report. Copies of the report are available for your review at the Corps Buffalo District Office, and at the local municipality offices within the watershed. If you require further information, please call David P. MacPherson, Study Manager, at (716) 876-5454, ext. 2245.

I encourage you to attend and participate in the public meeting on 15 August 1979.

Sincerely yours,

4 Incl
as stated

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

MacPherson___
Kelly_____
Gilbert_____
Hallock/
Liddell_____
Braun_____
Johnson_____

Lawrence Dawson, Chairman
Penfield Planning Board
3100 Atlantic Avenue
Penfield, NY 14526

Irene Gossin, Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Supervisor
Town of Victor
6475 Boughton Hill Road
Victor, NY 14564

Howard Gillan, Chairman
Victor Planning Board
85 E. Main Street
Victor, NY 14564

ROCHESTER TIMES UNION

MAY 8, 1979

Irondequoit Creek 'Much Cleaner'

By PAULA GODWIN

The quality of water in Irondequoit Creek has improved dramatically in the last year and the water in Irondequoit Bay modestly, says a scientist with the Monroe County Health Department.

Since 10 of 14 small sewage plants on the creek began diverting sewage to the Van Lare Sewage Treatment Plant in the spring of 1978, the water in the creek has become markedly cleaner and clearer, said Richard S. Burton, an associate chemist for the Health Department's environmental health laboratory.

He said there is some improvement in the clarity of Irondequoit Bay water, since the creek feeds into the bay. But the algae in the bay are still so heavy one can't see beyond 1 to 4 feet down, Burton said yesterday.

He said the bay is plagued by more complicated problems with phosphorus buildup that will make its recovery slower than the creek's.

After the sewage diversion began "there was rapid improvement in the creek water," he said in a report to the Rochester Committee for Scientific Information, which he serves as a member of the board of directors.

The amount of phosphorus being dumped into the creek dropped by 80 percent and the amount of dissolved oxygen in the water increased, he reported.

D. Kelly / DK 5/14
D. Murphy

Planning

- Phosphorus acts as a fertilizer and promotes the growth of algae. When the algae decompose, "it's organic material, it stinks and it consumes oxygen," Burton said. "It has all the direct characteristics of human sewage."
- Fish cannot live in water where phosphorus and algae have removed the oxygen, Burton said.
- In 1977, the creek averaged 4.5 milligrams of oxygen per liter. Six months after the sewage diversion began, the average rose to 8.5 milligrams per liter, Burton reported. He said the creek is now at its oxygen saturation point.

It is probably too soon for the creek's fish level to have changed, Burton said. But he said, "the creek has clearly recovered. It shouldn't have any odor problems like it had a couple of years ago. It's much cleaner."

The creek has no good spot for swimming. But Dr. Joel Nitzkin, Health Department director, said that even if it did, he would not advise swimming there "because there is a very distinct hazard of water contamination on an intermittent basis ... from surface runoff from chemicals on the lawns, and septic tanks not functioning." Burton urged in his report that the county apply for money under the Clean Lakes Program to study the overall water quality management of the bay and creek. He said some of that money could be used to investigate the possibility of constructing a reservoir for creek water so residents could use it for recreation.

Nitzkin said a larger retention of the water would dilute intermittent pollution. But he said that he had not talked to Burton about the reservoir suggestion and that it needs further study.

Burton said he has thought of three possible sites for a reservoir: Spring Lake Park, downstream from East Rochester near Whitney Road; Corbett's Glen on Allen's Creek, upstream from Panorama Plaza; and the area where Route 96 crosses the creek at Bushnell's Basin.

But if the county gets federal money, he said, it should primarily be used for studying phosphorus pollution in the bay and how to resolve it.

Burton said the bay is polluted by both external and internal sources.

The major external sources are small sewage treatment plants still operating in Henrietta, Pittsford, Irondequoit, Penfield and Webster (although they are expected to close by fall), the Plymouth Rock Provision Co. industrial plant and storm water runoff, he said.

Burton said the county is urging the Plymouth Rock plant to treat its wastes for phosphorus or have the county Pure Waters (sewers) Division do it. Storm water runoff is still a problem, but one pollutant, de-icing salt, has lessened since suburban towns reduced the amount of salt they use on roads in the winter, Burton said.

The bay's largest problem may well be coming from within itself, he said.

Phosphorus has built up in the depths of the bay, creating an anaerobic, or airless, environment beginning about 15 to 20 feet below the surface. The bay's deepest point is about 75 feet, Burton said.

During the spring and fall, temperature changes on the bay's surface cause the surface water to sink, and the shifting water brings the phosphorus to the top. "Once on top, where the water has air and the sun shines through, it induces the growth of algae just like any other fertilizer," Burton said in his report. "When the phosphorus from the bottom recycles in this way, the bay is essentially refertilizing itself."

The lack of oxygen at greater depths has kept out prime sport fish like the salmonoid, said Burton.

There are three ways, Burton said, to stop the bay's self-fertilization:

First, the bottom could be dredged. However, this might be difficult and costly because of the bay's depth, he said.

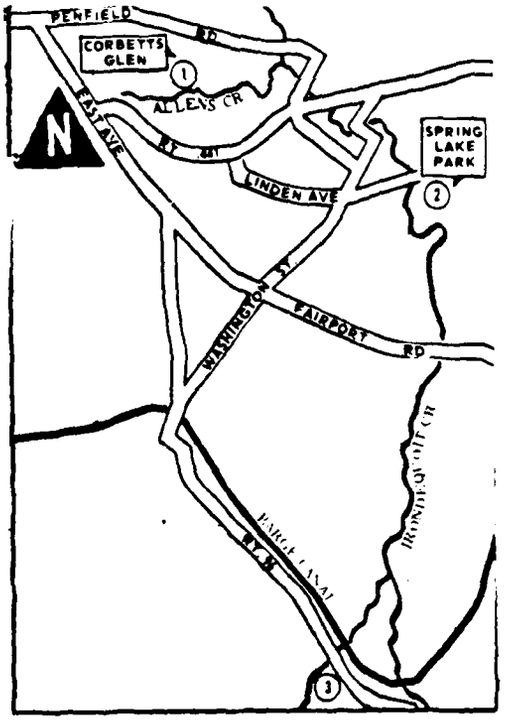
Second, a layer of sealing material, such as lime, alum or fly ash, could be laid on the floor of the bay to keep the phosphorus locked in the mud on the bottom. Burton said this is a cheap and effective method of dealing with the problem, and the method he favors.

Third, the deeper waters could be injected with compressed air or oxygen. This could be quite expensive and would require a power generator, he said.

Burton said the bay water may appear clearer as fewer nutrients are deposited from outside sources, but "unfortunately the process of decomposition of the bottom muds is expected to keep the deeper waters devoid of oxygen for decades."

Times-Union photo – Burt Lewis

A cleaner Irondequoit Creek flows through Spring Lake Park in Perinton, suggested site for a recreational reservoir.



Map shows three possible sites suggested by a health department official, in accompanying story, for a Irondequoit Creek recreational reservoir.

CORPS OF ENGINEERS BUFFALO DISTRICT

PENFIELD PRESS
Penfield, N.Y.

MARCH 28, 1979

Flood Maps Meeting Slated

Maps showing areas in Penfield likely to have flooding problems will be the subject of a townwide meeting next Wednesday, April 4 at 3:00 p.m. in the Penfield Town Hall. The maps were prepared under the Federal Insurance Administration, and properties designated in flood or mudslide prone areas are eligible for federally subsidized flood insurance.

Penfield Supervisor Irene Gossin, who arranged for the meeting with federal officials, said she expects an engineer will explain the maps and another person will explain the insurance provisions of the legislation. The maps are now available for the public to see in the Penfield Town Hall, 3100 Atlantic Avenue.

Mrs. Gossin said that a resident can file an appeal if he believes the map showing his property is incorrect.

She noted that the Town of Penfield will file an appeal. After she reviewed the maps with the acting superintendent and personnel of the Department of Public Works, they agreed that there are trouble areas in town which do not appear as such on the maps. Some of these areas are not near creeks but have high water tables or are prone to mudslides.

Under this program, residents in designated flood or mudslide prone areas can obtain flood insurance through their own agents, all of whom can buy the subsidized insurance from the carrier designated in this state by the federal government.

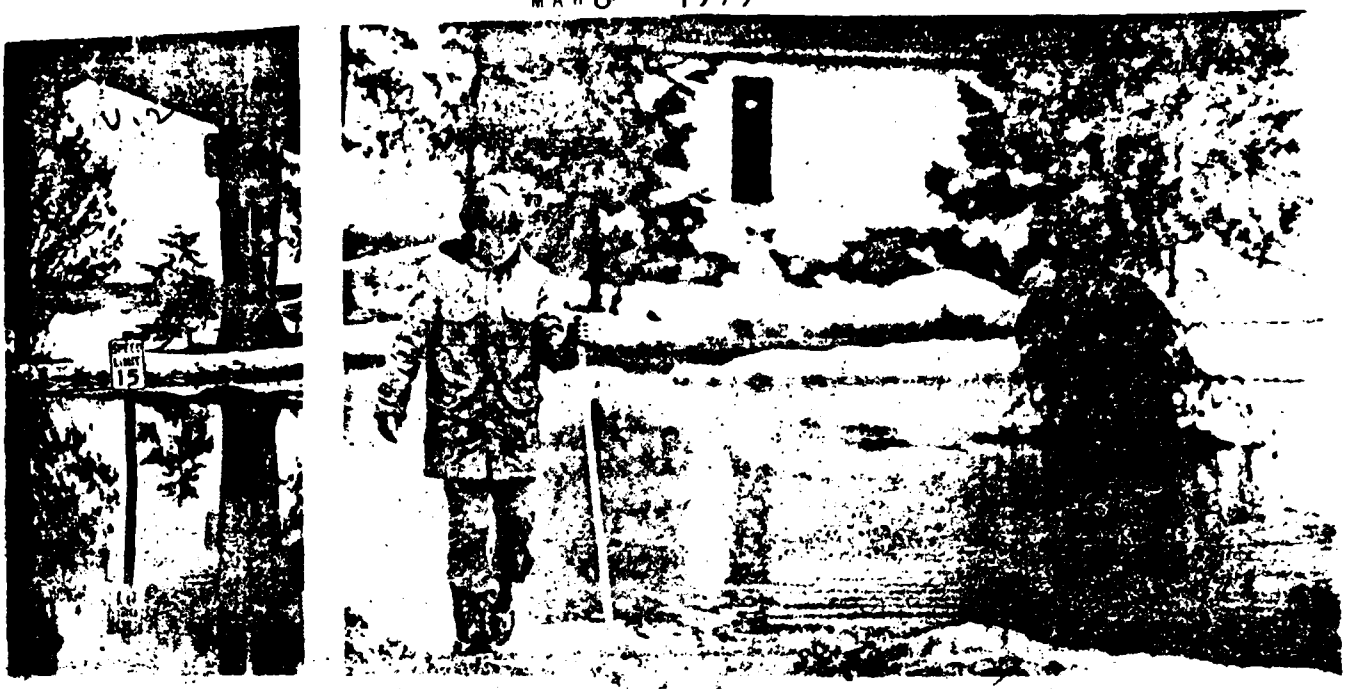
B Wade
D. Kelly

PENFIELD
POST-REPUBLICAN
Pittsford, N.Y.

CORPS OF ENGINEERS

BUFFALO DISTRICT

MAR 8 1979



FLOODING -- High waters in Penfield's flood-prone areas threatened to cause major damage. Picture on the left shows two feet of water surrounding the building of the Genesee Conservation League. On the left, Todd English, 176 Penn La., takes his own survey of water Residents were waiting to be evacuated in case of emergency. (Photos by Kurt Dreas.)

Rising Water Threatens Panorama, Ellison Park, and East Penfield

Penfield Public Works Director Charles Ackerman described the minor flooding in the town a "foreshadowing of Spring."

Town officials and residents got their first glance for this year of what could happen in flood-prone areas due to warm weather, and rainstorms.

Parts of Panorama Plaza, Ellison Park and East Penfield were under water caused by the weekend's heavy rains and melting snow.

The first reports of flooding came in early Sunday evening, said Ackerman. Most streams, he said, were at capacity.

Irondequoit Creek began rising over its banks by Sunday night around 10, said Ackerman. A barricade was put up at the west end of Panorama Plaza's parking lot, to prevent water from flooding the lot.

"It was very dangerous," Ackerman said.

The Genesee Conservation League was under about two feet of water. The road behind Panorama Plaza was closed Monday, as water from Irondequoit Creek threatened to cause major flooding.

Ackerman said he and a team of inspectors kept a flood watch throughout Sunday night. The high water levels peaked late Monday morning.

Ackerman said the flood plain zone in the Panorama area was monitored and documented for the town's engineers.

On Monday, the Brook Hill and Penfield Park Apartments were reporting about three inches of water in their basements, Ackerman said.

Ackerman said the apartments were preparing for evacuation.

Water reached the level of the Old Penfield Rd. bridge, but did not flood the bridge, Ackerman said. For safety, the bridge was closed.

Ellison Park also experienced some flooding, said Ackerman. Another potential flood area, Tufa Glen at Creek St., was watched carefully.

In the past, water has been known to flood the area, closing off Creek St.

In East Penfield, Ackerman said, residents had flooding in their backyards, caused by runoffs from nearby farms.

Farm land in East Penfield at times looked like mini-lakes as water filled low lying areas.

D Kelley ✓
H Cunningham
T Pierpont
M Stark

NCD ccs: Irondequoit Creek file

Planning
1-72

Flooding

U12

POTENTIAL DANGER -- Top picture shows Ellison Park, which looked like a lake Tuesday afternoon. Bottom picture shows RG&E inspector, checking water levels behind Panorama Plaza.

'A foreshadowing of Spring'

2 of 2

CORPS OF ENGINEERS

BUFFALO DISTRICT

PENFIELD PRESS

Penfield, NY

MAR 8 1979

Your Town

by Irene Gossin

The recent warm weather, although a welcome relief from this very cold winter, has caused countless problems throughout the entire area due to melting snows. Penfield is no exception. On Sunday and Monday of this week, it seemed the whole town was one big lake. The Panorama area as usual had to be barricaded in places and a close watch was kept in order to warn the apartment developments in the vicinity in case evacuation was necessary as was done in 1974. Fortunately, no heavy rains materialized to add to the natural run-off.

There were many other trouble spots, and the Highway crew was kept busy. It should be realized that there are legal limits and constraints on Town crews as to the work they can perform. In cases involving State or County roads, permission from those agencies must be obtained. In the case of private property where the Town has no easements, work cannot legally be performed.

It would be highly desirable for every member of the Town's various boards -- Town Planning, Zoning, Conservation, etc. -- to tour the affected areas and hear first hand from residents and tenants of the problems they have. With this kind of information and knowledge in hand, they would be better prepared to review intelligently the many applications for development and building the Town receives. In the seven years I have been Supervisor, I have learned this lesson very well. Applicants can be very persuasive, and plans on paper can be beautiful. However, a hard-headed, practical attitude is necessary to prevent future problems. We already must cope with too many that are existing.

It is appropriate that today's column once again mentions the final flood maps of the Town which have been receivd from the Federal Flood Insurance Administration. The deadline for appeals is April 25th and the maps will become effective on Nov. 25th. The maps can be seen in the Public Works office and/or in my office in the Town Hall. Any appeal is to be sent to the Supervisor's office, and I am then required to forward it to the FIA. To date, we have had no inquiries and no appeals.

I have been in contact with the Washington office of the FIA and am attempting to have one of their field representatives come to Penfield in order to hold a public informational meeting. It appears to be promising. I will keep the boards and the public informed.

Don't forget that the federal flood insurance program covers mud slides as well. Penfield has erosive steep slope areas, and property owners should be aware of this coverage.

D Kelly ✓
T. Peeling

CORPS OF ENGINEERS BUFFALO DISTRICT

BRIGHTON-PITTSFORD POST
Pittsford, N.Y.

FEB. 15, 1979

Brighton Flood Study By HUD Being Revised

Representatives of the Department of Housing and Urban Development (HUD) are going back to the drawing board with preliminary drafts of a Brighton flood insurance study.

The decision for revision followed a Jan. 29 informational meeting with Brighton town officials and residents.

The town was able to provide HUD with additional drainage information which will be recorded on the preliminary flood map with a lesser classification, according to Brighton building inspector Gary L. Shirley.

Shirley said this means a 90-day appeal period set by HUD has not yet started.

Robert Evans, acting commissioner of public works, said that a townwide drainage study completed in August, 1978, provided the supplementary information.

"We noticed certain ommissions in the map and discussed them with HUD at the meeting," he said.

He added that the area the town felt was left out consists primarily of undeveloped land affected by Allens Creek — land south of Westfall Rd. and west of Winton.

Brighton was one of the first to apply for inclusion in a National Flood Insurance program. Since then, a study group has hired consultants to do engineering and survey work in Brighton.

The researchers will come up with revised maps and tables, showing flood areas and elevation, to be used in calculating insurance rates.

The rates are to be determined by the extent and chance of flooding at a given location.

Evans said that flood areas were studied independently by HUD. For example, the Genesee River might be studied, but its effects on Red Creek and vice versa might not be included.

This means that certain related occurrences, such as backwash flooding, have not been taken into account by HUD, he said.

The drainage study conducted by the town helped cover some of these areas.

"Our study has given us a broader perspective of what drainage problems exist and where," Evans said.

The town public works department and a drainage committee are working on a drainage ordinance

One aspect of the ordinance would be to make retention and detention pond locations a part of the town master plan.

P. Leuchner
A. Coniglio
T. Pierzynski

NCBED-PF 9 February 1979

Paul M. Spiegel, Supervisor
Town of Pittsford
11 South Main Street
Pittsford, NY 14534

Dear Mr. Spiegel:

This is in regard to your letter dated 3 April 1978, and confirming your telephone conversation on 1 February 1979, with Mr. Thomas Sloan of my staff, concerning erosion problems on Irondequoit Creek in the vicinity of the New York State Barge Canal, town of Pittsford, NY. Since April 1978, Mr. John McCarthy of my staff has discussed the problem area with you on several occasions. A field survey of the area was completed during November 1978 which is the basis of our evaluation.

As Mr. Sloan told you, I have no authority to provide funding for protection of erosion areas on private property. The eroded streambank can be protected by installation of a riprap or gabion revetment and the water velocity can be controlled by construction of a stilling basin downstream of the culverts under the canal. A debris retention structure, properly maintained upstream of the culverts, would also be worthwhile.

I suggest that you contact the Waterways Maintenance Engineer, New York State Department of Transportation, Region 4 in Rochester, NY, to determine if he can provide any assistance to alleviate your problem.

Detailed engineering studies would be required before implementing any of the structural measures which I have proposed. While I cannot provide any financial assistance in this matter, my staff is available to provide planning assistance and technical information to aid in the development and implementation of flood and erosion control measures.

NCBED-PF
Paul M. Spiegel, Supervisor

If you have any further questions concerning this matter, please contact Mr. Thomas Pieczynski, Chief, Flood Plain Management Services, (716) 876-5454, extension 2143.

Sincerely yours,

DANIEL D. LUDWIG
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN
NCBED-PF

MacPherson___
Sloan_____
Pieczynski___
Gilbert_____
Hallock/
Liddell_____
Braun_____
Ludwig_____

CORPS OF ENGINEERS

BUFFALO DISTRICT

PENFIELD PRESS
Penfield, N.Y.

FEB. 8, 1979

Your Town

V12

by Irene Gossin

The Monroe County Supervisor Association held an all-day work session with County and State Legislators last Friday. This is an annual event the purpose of which is to discuss various legislative matters affecting towns.

Among the subjects discussed were Town work on County highways, Public Transit, Police Services, Civil Service, Sales Tax Structure, County-Wide Reassessment, Capital Improvement Financing, Primary Elections, Real Property Tax Exemptions, the Games of Chance Law and the Effect of Proposition 13 in N. Y. State.

In my column of January 16 I stated that the Flood Insurance Study and Rate Maps have been received from the Federal Flood Insurance Administration and can be seen in my office or in the Dept. of Public Works Legal notices have been published by the FIA in the Town's official newspaper. I have appointed the Director of Public Works and his Deputy to review the maps with me. Within two weeks we should be making a recommendation to the Town Board as to whether or not the maps should be accepted or whether or not an appeal should be filed If residents have inquiries or objections, please contact my office.

Although snow fall this year is less than that of last year to date, there is beginning to be significant accumulation along highways and sidewalks. It is important that hydrants be cleared in case of fire. If you have a hydrant near or in front of your home, won't you please take a few minutes to remove the snow. The home you save may be your own.

The Irondequoit Bay Harbor Steering Committee met last week after many months during which time the Army Corps of Engineers compiled more data and completed more analyses of the various options.

Concerns about the federal and local shares in financing, environmental impacts as to dredging and disposal of dredged material, and philosophical considerations as to the desirability of sailing vessels or power boats emerged as matters of greatest importance.

Another meeting will be held on Feb. 14 at which time the Committee could conceivably come to a consensus.

T. Piaczynski.

J. Henry

CORPS OF ENGINEERS

BUFFALO DISTRICT

PENFIELD POST-REPUBLICAN

Pittsford, N.Y.

FEB. 8, 1979

Your Town

By Irene Gossin
Town Supervisor

The Monroe County Supervisors' Association held an all-day work session with county and state legislators last Friday. This is an annual event, the purpose of which is to discuss various legislative matters affecting towns.

Among the subjects discussed were town work on county highways, public transit, police services, civil service, sales tax structure, county-wide reassessment, capital improvement financing, primary elections, real property tax exemptions, the games of chance law, and the effect of Proposition 13 in New York State.

In my column of Jan. 16, I stated that the Flood Insurance Study and Rate Maps have been received from the Federal Flood Insurance Administration, and can be seen in my office or in the Dept. of Public Works. Legal notices have been published by the FIA in the town's official newspaper.

I have appointed the director of public works and his deputy to review the maps with me. Within two weeks we should be making a recommendation to the town board as to whether or not the maps should be accepted, or whether or not an appeal should be filed. If residents have inquiries or objections, please contact my office.

Although snow fall this year is less than that of last year to date, there is beginning to be significant accumulations along highways and sidewalks. It is important that hydrants be cleared in case of fire. If you have a hydrant near or in front of your home, won't you please take a few minutes to remove the snow. The home you save may be your own.

The Irondequoit Bay Harbor Steering Committee met last week after many months, during which time the Army Corps of Engineers compiled more data and completed more analyses of the various options.

Concerns about the federal and local shares in financing, environmental impacts as to dredging material, and philosophical considerations as to the desirability of sailing vessels or power boats emerged as matters of greatest importance.

Another meeting will be held on Feb. 14 at which time the committee could conceivably come to a consensus.

T. Piecyuski
J. Henry
NCD

NCBED-PR 30 January 1979

Honorable Frank J. Horton
House of Representatives
Washington, DC 20515

Dear Mr. Horton:

This is in response to your letter dated 19 January 1979, concerning reevaluation of flooding problems in the village of Pittsford, New York.

Although completion of the Preliminary Feasibility Report for the Irondequoit Creek Basin has slipped until March due to the departure of the study manager, I am able to provide you with the general conclusions that I expect to be reached. Within the Irondequoit Creek Basin, structural solutions to projected flooding problems do not appear feasible except in the Panorama Plaza area of Penfield. Our analysis of collected data indicates that potential flooding damages in other villages and townships within the basin are insufficient to justify the Federal expenditures necessary to prevent such damages.

You are no doubt aware that I spent most of 1978 attempting to incorporate a sophisticated flood plain information technique into this study. This computerized approach involves a significant amount of data collection and provides a means of predicting the extent of impact throughout the basin due to land use changes in part of the basin. Such a program is only valuable as long as the data is kept current. I was unable to acquire a firm commitment of all potential users to maintain this system, and thus justify the Federal expenditure. Consequently, I have deleted this aspect from the study.

Obviously, I do not expect the Preliminary Feasibility Report to provide recommendations which will offer positive flooding protection for the village of Pittsford. At this time, I feel that the only Federal assistance that can be provided would be in the form of guidance or suggested approaches to zoning which would minimize future flooding damages. At all times, I have the capability to provide direct technical assistance to local governments in developing flood damage protection measures. This would include providing technical data which is available.

NCBED-PF
Paul M. Spiegel, Supervisor

If you have any further questions concerning this matter, please contact Mr. Thomas Pieczynski, Chief, Flood Plain Management Services, (716) 876-5454, extension 2143.

Sincerely yours,

DANIEL D. LUDWIG
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN
NCBED-PF

MacPherson___
Sloan_____
Pieczynski___
Gilbert_____
Hallock/
Liddell_____
Braun_____
Ludwig_____

NCBED-PN 7 November 1978

Ms. Elinor Osborn
Penfield Conservation Board
3100 Atlantic Avenue
Penfield, NY 14526

Dear Ms. Osborn:

This is in reply to your 17 October 1978 letter concerning alternatives for flood management in the Irondequoit Creek basin, particularly at Panorama Plaza. I appreciate and concur with many of your comments which suggest that methods other than traditional structural flood control should be investigated. I hope to develop a closer working relationship with Penfield town officials and advisory boards, and to depend on their data and input as the study progresses.

I would like to comment on several points made in your letter so that you may have a better understanding of the study.

As I discussed with Mrs. Cossin last week, the Corps of Engineers no longer intends to develop a land use analysis system. This decision was based on the fact that I could not secure support from all of the towns in the watershed. During the past year, members of my staff have attempted to explain the land use analysis technique to applicable municipal leaders in an effort to gain full support of the concept. While I consider this approach to flood control planning to be very desirable, I can understand the reluctance of certain townships to adopt it. Recent hydrology investigations made for the basin revealed that development of a land use analysis system is not essential for flood analyses based on presently planned growth patterns in the basin. However, a major change to the present land use plans could adversely impact on flooding conditions.

As far as Panorama Plaza is concerned, your objections to structural flood control measures are understandable. A cost analysis for relocating the Plaza area's businesses is being considered as you

11/2=44

NCBED-PR
Ms. Elinor Osborn

suggested, but the costs are expected to be many times the benefits. The most cost effective alternative for protecting this area will probably include the following measures:

a. Remove the Plaza extension bridge and Old Penfield Road bridge.

b. Increase the channel width from Route 441 to below the Genesee Conservation League. The existing channel would also be cleared and snagged.

c. Increase the channel depth within the Dolowite Products Co. property.

In conjunction with this alternative, the Federal government could participate in development of a recreational area or arboretum behind the Plaza. Other means of environmental enhancement will also be considered. It is my conviction that through the cooperation of all concerned, the environmental and flood management objectives can compliment each other.

In January 1979, a public workshop will be held to present a description of the alternatives that have been investigated. You will receive a meeting notice and it is hoped that we can discuss this matter further at that time.

Sincerely yours,

DANIEL D. LUDWIG, P.E.
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

McCarthy _____
Kelly _____
Gilbert _____
Hallock/ _____
Liddell _____
Braun _____
Ludwig _____

Sent 10/19/78

SW/2245

NCBED-PN

~~25 September 1978~~

SUBJECT: Withdrawal of Irondequoit Creek Supplement to the Plan of Study (RECON)

Division Engineer, North Central
ATTN: NCDPD-PF

1. Reference is made to the following letters:

a. NCBED-PN, 27 April 1978, submittal of Irondequoit Creek Supplement to the Plan of Study (RECON).

b. NCDPD-PF, 1st Ind. to reference a., dated 7 June 1978, providing tentative approval and comments on the above supplement.

c. NCDPD-PF, 22 June 1978, comments on Irondequoit Creek Supplement to the Plan of Study (RECON).

2. The District has reassessed its position on the value of an expanded analysis for the Irondequoit Creek study. There are no clear Corps needs related to evaluation and formulation of alternatives that warrant the development of an expanded analysis model in this basin. In addition, local interests in the watershed have recently shown a negative reaction to utilizing its capabilities, should such a model be developed.

3. Due to the lack of a more positive reaction, the Buffalo District has decided not to pursue an expanded analysis for the Irondequoit Creek study. Accordingly, I recommend the withdrawal of the above-mentioned supplement to the Plan of Study.

4. The study effort already devoted to this supplement and an analysis as to its inappropriateness will be incorporated in the Preliminary Feasibility Report due in November 1978.

DANIEL D. LUDWIG
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

Pietrus_____
McCarthy_____
Kelly_____
Gilbert_____
Hallock/
Liddell_____
Braun_____
Ludwig_____

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
NCBED-PN	Meeting with Local Interests on Irondequoit Creek

THRU: Chief, E. Basin — FROM Study Mgr Asst, NY — DATE 19 Oct 78 — CMT 1
Pietrus/sk/2245

Chief, Planning

Chief, Engr. Div.

DE

TO: Files

1. Date: 28 September 1978 at 2000 to 2135.

2. Place: Town Hall, Penfield, NY.

3. Purpose: To discuss flood control alternatives for the Panorama Plaza area and computer modeling.

4. Participants: See attached sheet.

5. Summary: Colonel Daniel Ludwig opened the meeting by thanking all those present for their attendance and participation. The Colonel gave a brief background summary of the study, stating that original funding began in 1975 for a full scale study. He noted that the Plan of Study was developed in 1976 and that the PFR is due in November 1978. The Colonel emphasized the need for Institutional Planning for solutions to the problems at Panorama Plaza. Also, he noted that due to the blizzard of 1977, the Buffalo District fell behind on this project, but that he had visited with Irene Gossin last year to discuss a possible Oconee type study. The Oconee study needed commitments from the towns in order to be successful. However, with a majority of negative responses after nearly a year of discussion with the municipalities, the Colonel decided not to pursue Oconee any further.

There are a number of alternatives open to the people which include channelization, floodwalls and levees, diversion, and consideration of reservoir sites. Colonel Ludwig requested feedback from the local people in regards to their views concerning the structural measures, and that he would proceed with as little a change in ecology as possible.

Irene Gossin asked "is Oconee dead?" She stated that the communities upstream are not totally aware of the problems that exist downstream of them, mainly in Penfield, and that she would be very pleased if someone would set up some kind of committee that would be able to inform the communities of what effect upstream development has on the stream flow.

Colonel Ludwig responded that Oconee has been stopped because (1) several towns do not like Federal Government intervention in localized planning, and that (2) the upstream towns feel that there is no problem in their townships such that Oconee would be of any use to them. The Colonel was asked why the county of Monroe is against Oconee, at which time John McCarthy responded that the county is not against Oconee, but that they find it difficult running the show with so much local input and cooperation necessary in order to make Oconee a success. John Lamb of the Monroe

County Planning Department stated that he feels it would be a good idea to talk to the local engineer of the towns and inform them of what is needed to make Oconee successful.

The Department of Environmental Conservation stated that they cannot at this time make a monetary commitment to support Oconee, but hope to work something out in the near future, especially in regards to water quality. They emphasized that they are not against Oconee, but that they cannot support Oconee financially at this time. John McCarthy stated the DEC's role is secondary at this point and that their participation would be helpfull once Oconee is started. The town of Brighton supports Oconee or any other alternatives taken. The Genesee/Finger Lakes Regional Planning Council indicated that they are just starting up and would have to hold a council meeting before making a commitment on Oconee. The town of Victor Supervisor stated that his town (1) has no problems from flood waters, (2) has neglected the effects on downstream communities due to Victor development in the past, and (3) would support some type of committee. The town of Perinton stated that they are tight on money and are situated upstream of Panorama Plaza. They also feel that enough studies have been done already and that the Penfield problems are of no concern to Perinton even though they do add to the problem downstream. Irene Gossin then stated that she notified all the local supervisors and received a majority of support for a regional group and hopes that this group can be formed to evaluate the study.

John Adams then presented his information on Land Resources Information System (LRIS) that was completed in Toledo, OH. Variables such as land uses, soil conditions, evaluations, and political boundaries were coded into a computer data base. Over 80 percent of the land studied was in use for agriculture. The variable slopes of the land caused severe erosion problems, and thus water pollution mitigation was developed. The information was utilized to locate desirable and undesirable land uses and is presently still being used by the locals for land use planning guidance.

John McCarthy then explained the work that has been done by MSR and the Corps. He presented a stage-damage curve of the Panorama Plaza area, a map of the watershed with possible reservoir sites, an aerial photograph showing the structural measures under consideration, and a cross section of the measures. A member of the Penfield Town Planning Board stated that the town has some vacant land available for a reservoir, at which time John noted that the reservoir alternative will be looked into further as a possible combination with

other structural alternatives. To date, the reservoirs considered have limited capacity. Irene also stated that the sewer line in the bridge behind the Plaza could possibly be relocated and that the bridge on Old Penfield Road could be eliminated with no serious effect on traffic diversion. Colonel Ludwig closed the meeting by stating that the PFR due in November will be more specific about our plans. Irene Gossin then nominated herself as committee chairperson with the town of Victor Supervisor, Douglas Fisher, as vice-chairman. It shall be interesting to see what developments are made by the committee in the future.

Thomas J. Pietrus

THOMAS J. PIETRUS
Study Manager Assistant

Irondequoit Creek Study Workshop
28 September 1978

	Name	Representing
1.	Linda Florman	Herself
2.	Tony LaFountain	Town of Penfield
3.	Elinor Osborn	Penfield Conservation Board
4.	Frank J. Keller	DEC - Avon
5.	Irene Gossin	Town of Penfield
6.	John Eisenberg	Town of Brighton - DPW
7.	Gary Shirley	Town of Brighton - DPW
8.	C. H. Philbin	Penfield Town Board
9.	Don Glondys	MSR Engineers
10.	Kenneth Peck	MSR Engineers
11.	John Lamb	Monroe County Planning Department
12.	Col. Daniel Ludwig	Corps of Engineers
13.	Daniel T. Kelly	Corps of Engineers
14.	John McCarthy	Corps of Engineers
15.	Tom Pietrus	Corps of Engineers
16.	Mike Vanderlip	Corps of Engineers
17.	John Adams	Corps of Engineers
18.	Anna Bundschuh	Penfield Town Board
19.	Allen R. Park	Perinton Conservation Board
20.	John M. Davis	Monroe County Division of Pure Waters
21.	Chuck Ackerman	Director of Public Works - Penfield
22.	Barry A. Kyhos	Town of Perinton
23.	Charles Roxin	Genesee/Finger Lakes Regional Planning Council
24.	Donald S. Milton	Penfield Town Board
25.	Costich	Rochester, NY
26.	Douglas A. Fisher	Town of Victor Supervisor

NCEED-PN 18 September 1978

A workshop is scheduled for 28 September 1978, 8:00 p.m., Penfield Town Hall, to explain the studies that the Corps of Engineers is presently making under the Irondequoit Creek Study. You or your representative are invited to attend and participate.

The agenda for the meeting is as follows:

a. A presentation of various flood protection alternatives for Panorama Plaza

b. Announcement of why the Corps is dropping the development of a land use model (Oconee-type study)

c. A presentation on broad applications of land use data in regional planning.

This meeting will be of particular concern to Penfield officials because of the location of Panorama Plaza. However, an important object of the meeting will be to emphasize to all town officials and planners the benefits of coordinated regional planning and especially the need for a coordinating group.

An informal meeting is anticipated and each town will be asked for its viewpoint on the above matters.

Sincerely yours,

KENNETH E. HALLOCK, P.E.
Assistant Chief, Engineering Division

CF:
NCEED-PN

McCarthy _____
Kelly _____
Gilbert _____
Hallock _____

Don Martin, Director
Monroe County, Department of Planning
301 County Office Building
Rochester, NY 14614

Irene Gossin, Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Mr. Paul Schmeid
New York State Department of Conservation
P.O. Box 57
Avon, NY 14414

Roberta Barnes, Supervisor
Town of Mendon
9 North Main Street
Honeoye Falls, NY 14472

Richard Miles, Supervisor
Town of Brighton
2300 Elmwood Avenue
Rochester, NY 14624

John Kelly, Supervisor
Town of Henrietta
475 Calkins Road
Henrietta, NY 14467

Lake Edwards, Supervisor
Town of Perinton
31 South Main Street
Fairport, NY 14450

Paul Spiegel, Supervisor
Town of Pittsford
11 South Main Street
Pittsford, NY 14534

Douglas Fisher, Supervisor
Town of Victor
85 East Main Street
Victor, NY 14564

NCRED-PN 16 Aug 78

Mr. Paul M. Spiegel, Supervisor
Town of Pittsford
11 South Main Street
Pittsford, NY 14534

Dear Mr. Spiegel:

I have received your letters of 20 and 31 Jul 78 regarding possible drainage studies and requesting information on the Oconee study.

It should be noted that the Oconee-type study that the Corps proposes in no way replaces the need for qualified local engineering drainage studies but only increases the accuracy by which future conditions are predicted. It, therefore, will not answer the same questions as a local Comprehensive Drainage Study, and accordingly, will save your town little—if anything—in terms of basic engineering services. What this type of study will do is provide a basis for predicting water-related impacts of land use changes. This should assist in properly directing the long-term resources of the town. This information could best be described as additional input into your drainage studies. The proposed Oconee-type study does not provide data or solutions for today's drainage problems but would provide data that would better demonstrate alternatives and impacts for future developments. This type of information, if properly utilized, would reduce drainage, run-off, and erosion problems in the future.

It is also of note that the response of other watershed towns towards an Oconee-type study has not been completely favorable, and its future is doubtful. An upcoming meeting will be announced at which this matter will be discussed.

jhr/2244

NCBED-PN
Mr. Paul M. Spiegel, Supervisor

The material you requested is inclosed.

Sincerely yours,

1 incl
As stated

THOMAS R. BRAUN
LTC, Corps of Engineers
Deputy District Engineer

CF:
NCBED-PN

McCarthy _____

Kelly _____

Hallock/Liddell _____

Braun _____

NCRED-PF 7 August 1978

Honorable Frank Horton
House of Representatives
Washington, DC 20515

Dear Mr. Horton:

This is in response to your letter of 21 July 1978 requesting a reevaluation of flooding problems in the village of Pittsford.

I share your concern for the village of Pittsford and accordingly have personally reviewed this situation. It still appears that under the Corps continuing authorities program, the problem area would not be eligible for a small erosion control or flood management project. However, as you are aware, I do have an on-going study for flood control and allied purposes for the entire Irondequoit Creek watershed which includes all of the village and the major portion of the town of Pittsford. I will have my staff investigate this problem further under the Irondequoit Creek study and consider possible alternative solutions on a basinwide basis.

Our present schedule under the Irondequoit Creek study is to complete a preliminary report in November 1978 on the feasibility of alternative measures for flood management and allied purposes. At that time, I will provide you the results of our further investigation of the village of Pittsford's problem.

I trust the above meets your present needs.

Sincerely yours,

1 Incl
Spec. Cont. Auth.

DANIEL D. LUDWIG, PE
Colonel, Corps of Engineers
District Engineer

CF:
HQDA (DAEN-CWA-D) w/incmg. corresp.
NCDED "
Exec. Ofc. "
PAO "
NCSED-PF "
NCSED-PB "
Honorable Frank Horton
Representative in Congress
107 Federal Building
Rochester, NY 14614

Booth
Piaczynski
Gilbert
Hallock
Liddell
Braun
Ludwig

NCBED-PW 22 May 1978

:

During the past eight months, the Corps of Engineers has made preliminary investigations to ascertain the need for, and usefulness of, developing a watershed representation (model) of the Irondequoit Creek Watershed for flood related and water quality purposes. Informally, local response has been generally positive in this regard, and accordingly I have requested approval of a supplement to the Plan of Study from my higher authority to undertake a detailed modeling study for the watershed. A draft copy of this supplement is enclosed for your information.

This detailed study is expensive ($300,000 estimate) and will require substantial effort from my most experienced technical people. I, therefore, want to insure that this detailed study will actually be used in planning the future growth and development of the communities and not just become an academic exercise.

To assure that there is a sincere desire to effectively use the model by each of the towns in the watershed, I ask that each town commit itself to the development and operation of the model for at least the period 1979-1984. Local costs are estimated to be $1,000 per town for the entire period. This cost includes coordination, mapping, and interpretation of results.

Establishing a coordinating committee is another topic for further discussion. I feel it is essential for continued operation of a model and offer the assistance of my staff in initiating actions for a meeting to select the leadership, function, and future agendas of such a committee. An official from each town should sit on this committee.

NCBED-PN

More specifically, I desire the following assurances before model development is initiated:

a. A letter of commitment from each Town Board in the watershed that the town will promote the use of information provided by such a model.

b. This letter of commitment should obligate the town to contribute $1,000 by January 1979 to a local fund to cover local costs in model operation for the period 1979-1984. I envision that this fund would be controlled by the coordination committee mentioned above.

c. This letter of commitment should state that the town will designate an official to this coordinating committee and that the town supports such a committee and its purpose of reducing future flood and water quality problems.

I fully realize that local officials may not be familiar with watershed modeling techniques. To overcome this difficulty, the initial meeting mentioned above will provide an opportunity for interested officials to become acquainted with the objectives of such a study. The attached information sheet summarizes the uses of an Oconee-type study and should prove helpful.

I request that you reply at an early date, and that you affirm the town's intentions with respect to the above assurances, so that we may proceed on what I consider a very innovative and promising study.

Sincerely yours,

1 Incl
as stated

THOMAS R. BRAUN
Lt Col, Corps of Engineers
Deputy District Engineer

CF:
NCBED-PN
Mr. Paul Schmeid
Monroe County Planning
NYSDEC, Avon

McCarthy ___
Kelly ___
Gilbert ___
Hallock ___
Liddell ___
Braun ___

Richard Wiles, Supervisor
Town of Brighton
2300 Elmwood Avenue
Rochester, NY 14624

John Kelly, Supervisor
Town of Henrietta
475 Calkins Road
Henrietta, NY 14467

Lake Edwards, Supervisor
Town of Perinton
31 S. Main Street
Fairport, NY 14450

Paul Spiegel, Supervisor
Town of Pittsford
11 S. Main Street
Pittsford, NY 14534

Douglas Fisher, Supervisor
Town of Victor
85 E. Main Street
Victor, NY 14564

Irene Gossin, Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Roberta Barnes, Supervisor
Town of Mendon
9 N. Main Street
Honeoye Falls, NY 14472

Letter sent to the following:

Lake Edwards, Supervisor
Town of Perinton
31 St. Main St.
Fairport, NY 14450

Schuyler Baldwin, Chairman
Perinton Planning Board
31 S. Main St.
Fairport, NY 14450

George Keene, Chairman
Perinton Conservation Board
31 S. Main St.
Fairport, NY 14450

Paul Spiegel, Supervisor
Town of Pittsford
11 S. Main St.
Pittsford, NY 14534

Edwin Haas, Chairman
Pittsford Planning Board
11 S. Main St.
Pittsford, NY 14534

John Fish, Chairman
Pittsford Conservation Board
11 S. Main St.
Pittsford, NY 14534

Malcolm Strong, Supervisor
Town of Victor
85 E. Main St.
Victor, NY 14564

George Day, Chairman
Cons. Advisory Council
1280 Titus Ave.
Rochester, NY 14614

Roberta Barnes, Supervisor
Masonic Temple Bldg.
Town of Mendon
Honeoye Falls, NY 14472

Robert Barrows, Director
Ont. Co. Planning Dept.
120 N. Main St.
Canandaigua, NY 14424

Raymond Parrish, Supervisor
Town of West Bloomfield
RD 2
Holcomb, NY 14469

Robert Peterson, Director
Wayne Co. Dept. of Planning
9 Pearl St.
Lyons, NY 14489

Wayne Scheik, Supervisor
Town of Macedon
7 Center St.
Macedon, NY 14502

Mr. James McShea
Erdman Anthony Associates
242 Andrews St.
Rochester, NY 14604

William C. Larsen, PE
44 Saginaw Dr.
Rochester, NY 14623

John Ziegler, Regional Director
Federal Insurance Administration
26 Federal Plaza
New York, NY 10007

Edward Holmes, Supervisor
Fish & Wildlife Service
NYSDEC
PO Box 57
Avon, NY 14414

Lucien A. Morin
Monroe County Manager
110 County Office Bldg.
Rochester, NY 14614

Don B. Martin, Director
Monroe County Dept. of Planning
301 County Office Bldg.
Rochester, NY 14614

Irvin King, Regional Director
NYSDEC
P. O. Box 57
Avon, NY 14414

Allan Buddle, Sr. Hydr. Engr.
NYSDEC
180 State St.
Elmira, NY 14901

Howard Gillan, Chairman
Victor Planning Board
85 E. Main St.
Victor, NY 14564

Bruce Vanderwater, Chairman
Victor Conservation Advisory Council
85 E. Main St.
Victor, NY 14564

Anthony Della Pietra, Mayor
Village of E. Rochester
314 Main St.
E. Rochester, NY 14445

Alfred Dezio, Chairman
E. Rochester Planning Board
314 Main St.
E. Rochester, NY 14445

Peter McDonough, Mayor
Village of Fairport
31 S. Main St.
Fairport, NY 14450

Joseph T. Carr, Chairman
Fairport Planning Board
31 S. Main St.
Fairport, NY 14450

David Shepherd, Mayor
Village of Pittsofrd
21 N. Main St.
Pittsford, NY 14534

William Lochner, Supervisor
Town of Webster
1000 Ridge Rd.
Webster, NY 14580

William McGowan, Chairman
Ont. Co. Bd. of Supervisors
Courthouse
120 N. Main St.
Canandaigua, NY 14424

Homer Smith, Chairman
Ont. Co. Planning Board
120 N. Main St.
Canandaigua, NY 14424

Richard Wiles, Supervisor
Town of Brighton
2300 Elmwood Ave.
Rochester, NY 14624

Barnet Levy
Planning Board Chairman, Brighton
2300 Elmwood Ave.
Rochester, NY 14624

Kirkwood Personius, Chairman
Conservation Advisory Council
2300 Elmwood Ave.
Rochester, NY 14624

John Kelly, Supervisor
Town of Henrietta
475 Calkins Rd.
Henrietta, NY 14467

Albert Scardetta
Planning Board Chairman
475 Calkins Rd.
Henrietta, NY 14467

Mr. John Lamb
Monroe County Dept. of Planning
301 County Office Bldg.
Rochester, NY 14614

Ronald Schroeder
Comm. for Cons. of Env. Chairman
475 Calkins Rd.
Henrietta, NY 14467

Donald Deuing, Supervisor
Town of Irondequoit
1280 Titus Ave.
Rochester, NY 14614

Richard Dormail, Chairman
Irondequoit Planning Board
1280 Titus Ave.
Rochester, NY 14614

Armand Piezinerill, Supt. of Pub. Works
Village of E. Rochester
314 E. Main St.
E. Rochester, NY 14445

Mr. Jery Stedinger
Cornell University
Hollister Hall
Ithaca, NY 14850

James A. Clark, Chairman
Mendon Planning Board
Masonic Temple Bldg.
Honeoye Falls, NY 14472

Alen Vaala, Chairman
Mendon Conservation Board
Masonic Temple Bldg.
Honeoye Falls, NY 14472

Irene Gossin, Supervisor
Town of Penfield
3100 Atlantic Ave.
Penfield, NY 14526

Lawrence Dawson, Chairman
Penfield Planning Board
3100 Atlantic Ave.
Penfield, NY 14526

James Irish, Chairman
Penfield Conservation Board
3100 Atlantic Ave.
Penfield, NY 14526

Anna Bundschuh
40 Cobbles Dr.
Penfield, NY 14526

Philip Packard, Chairman
Pittsford Planning Board
21 N. Main St.
Pittsford, NY 14534

Thomas Ryan, Mayor
City of Rochester
34 City Hall
Rochester, NY 14614

William Davis, Chairman
Rochester Env. Committee
56 Lakeshire Rd.
Rochester, NY 14612

Honorable Frank J. Horton
House of Representatives
Washington, DC 20515

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-PF

27 April 1978

Honorable David C. Shepard
Mayor, Village of Pittsford
Pittsford, NY 14534

Dear Mayor Shepard:

This is in reply to your letter dated 10 April 1978 requesting that I reconsider the erosion and flooding problems along an unnamed tributary of the Erie Barge Canal in the Austin Park area of the village of Pittsford, NY.

Messrs. Thomas Sloan and Raymond Pilon of my staff made a field inspection of the problem areas with Mr. Habecker, Village Clerk, on 21 April 1978. Based on this field inspection, I have determined that the problem areas do not warrant a Corps local flood protection or erosion protection project. Mr. Habecker indicated only two homes which have experienced flooding and advised us that this problem had been virtually eliminated by installation of a concrete sidewalk along the north side of Austin Park Road. The primary concern seems to be the erosive velocities of the stream which are attacking the streambank parallel to Austin Park Road. Our visual inspection of the area indicates that property owners have been allowed to encroach on the natural stream channel by constructing retaining walls of various material and, in one case, a house along the stream. Also, the stream channel has not been properly maintained by periodic removal of gravel shoals and vegetation. In the Austin Park Road area, residents have constructed small bridges across the stream for driveways. These bridges appear to restrict the stream flow during peak discharges, further complicating the flood and erosion problems.

The information provided in Lt. Col. Braun's letter of 27 March 1978 regarding the ineligibility of Austin Park Road for assistance under Section 14 was verified by the field inspection.

I suggest that the village implement a program of stream maintenance and restrict the installation of any further retaining walls which limit the stream capacity. I also recommend that the village investigate the possibility of replacing the driveway bridges along Austin Park Road with structures which will not restrict high discharges.

NCBED-PF
Honorable David C. Shepard

I am enclosing literature which Mr. Sloan discussed with Mr. Habecker concerning alternative measures of erosion control which may be effective in correcting the situation along Austin Park Road.

I regret that I cannot be of more assistance in this matter. If you have any further questions, please contact Thomas J. Pieczynski, Chief, Flood Plain Management Services, 716-876-5454, ext. 2143.

Sincerely yours,

DANIEL D. LUDWIG, PE
Colonel, Corps of Engineers
District Engineer

Incl
as stated

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
NCBED-PN	Public Workshop Irondequoit Creek Study Land Use Modeling Techniques

TO: Chief, Eastern Basin
Chief, Planning Br. CEG 4/11
Chief, Engineering Div.
DE

FROM: Study Manager

DATE 4 April 1978 CMT 1
JM/cs/2244

To: File

Date: 16 March 1978, 7:30 p.m.
Place: Henrietta Town Hall
Purpose: Explain & Discuss Oconee-type techniques
Participants: 40 people (See attached list)

Summary:

C. Gilbert (COE) opened the meeting at 7:50 p.m. By a show of hands it was shown that towns of the watershed were well represented. The general status and history of the Irondequoit Creek Study were outlined. The purpose of the meeting was described as seeking feedback on automated Flood Plain Management techniques. The type of model and who would operate it on a continuing basis were specific points of interest.

J. McCarthy (COE) spoke on the following:

1. Review of last meeting on modeling capabilities.

2. Review of work done since last meeting including local interviews and data gathering. Results of this work predicted that the local officials favored flood related modeling techniques but were split on how results could be implemented.

3. The types of information needed to develop a model were explained. Existing land use, topo., and zoning maps are examples of needed information.

4. Attractiveness for detention or recreation can easily be developed.

5. Several alternative futures for different project populations with or without building constraints could be evaluated in the basic model. Constraints could be a building ban on steeper slopes or a building ban below the projected year 2000 100-year flood height.

6. An organizational arrangement for continuing operation of a model was proposed. A watershed advisory group would be needed to coordinate and oversee the related activities or the towns or the watershed. A technical agency would be needed for mapping and technical coordination for data processing and interpretation of results. Monroe County with NYSDEC assistance was proposed.

☆GPO-1975-665-422/1063

The Corps would provide technical assistance by operating and maintaining the actual computer work.

7. The need for a letter of commitment from the towns was indicated. This might be in the form of $1000 per town for the year 1981.

8. The cost of a 1.15 acre grid cell system throughout the watershed would b approximately $300,000. A 4.5 acre grid with actual flood damages along 20 mi. of main streams would cost nearly as much.

9. There remains a problem with sensitivity of streams to land use changes. 2000 acre changes are probably the minimum size of change that can be detected with the proposed system of 1.15 acre grid. The concept is for broad-based watershed-wide impacts not necessarily 500 acre specific developments.

K. Peck of McPhee, Smith, Rosenstein, Engrs P.E., PC explained that through his contact with the study he believed Monroe County would definitely be best for local technical work. The towns would input to the county as they already do in other matters. Conservation boards should play an important role.

The meeting was opened for questions and answers:

Q. (George Costich, Irondequoit Conservation Board) Where would programs be stored and who would own them?

A. The tapes would be stored locally, perhaps at the University of Rochester. The Corps would own the tapes while using them. Afterwards, ownership could be transferred to a local agency such as Monroe County.

Corps note: Section 214, Corps funds for cooperation with New York State, might be used to fund this program for maintenance.

Need letter of committment from towns to support this program. Detailed model would cost $300,00, which includes what we have spent to date.

Q. Irene Gossin (Supervisor, Town of Penfield)
Why not use the same procedure as now used for reappraisal and reassessment? They now have to plug in every building permit, utilities, etc. How is the Federal Flood Insurance Administration involved in this? They would most likely have a big voice in keeping up the data bank.

A. The Federal Flood Insurance Administration (an agency under HUD) provides flood hazard maps; looks at existing localities, runs backwater curves, etc. with no overall master planning. Corps' program would give tools to local communities to shape their future. HUD looks at past flood insurance studies and does obtain data from the Corps.

Q. Irene Gossin
Worried that things will die down again. She wants to see a local committee that would have some significance concerning Irondequoit Creek. Would like similar organization like that used for the Irondequoit Bay project. Irene had suggested some time ago that an Irondequoit Creek Steering Committee be formed, with representation from every municipality. Staff cuts in Monroe County Planning among other reasons eventually led to this being dropped.

Q. When would we start this steering committee?

A. After the Corps receives approval from higher authority to proceed with the study.

Q. When would the modeling start?

A. Depends on funding for FY79.

Q. When would modeling be completed?

A. Eighteen months after starting.

Q. (Bob Evans, Brighton Dept. of Public Works) What are the local costs associates with modeling?

A. The Corps did not have adequate information on this because it is not clear who will do what on a continuing basis. $1000 per town master plan total is a rough approximation. Further information on this will be sent to supervisors, county legislators, and environmental boards.

Bob Evans: The model shouldn't dictate no development.

Suggestions arising from this workshop:

1. Decide early who will manage modeling and how it will be supported.

2. How will FIA be involved. Since more than just Monroe County is involved is this a problem?

3. A request was made for a steering committee to be established with each town from the watershed represented. (similar to the Irondequoit Bay Steering Committee and previous Irondequoit Creek Steering Committee which was abandoned due to Monroe County Planning Department staff cuts).

4. More information is necessary on operating and maintenance costs as well as how they would be administered.

5. Community Development funds or CETA funds might be used as financial assistance.

6. Town environmental boards should be considered because of their increased significance.

7. Towns might be covered by the State for half of their costs; this should be looked into.

8. When considering recreation, do not forget open space and detention areas (attractiveness model).

9. When considering a steering committee, make clear to all involved, the other uses that could be served.

Note: An earlier meeting was held from 4:00 p.m. - 6:00 p.m. with John Lamb, Monroe County Planning and Frank Keller, NYSDEC to discuss the capabilities of automated modeling, who would cost share in upkeep and especially the sensitivity to various land use changes. Both agreed that the people aware of this modeling expect a system responsive to small land use changes (100 - 500 acre). More definitive information is needed especially if these small changes can't be addressed. Specifically, since almost all applications for new development are under 500 acres, now do they use a system for regulation that only responds to changes in thousands of acres?

JOHN MCCARTHY
Study Manager

NAME	TITLE	ORGANIZATION
William H. Gill	Fish & Wildlife Biologist	U.S. Fish & Wildlife Service
F. J. McShea	Assoc. Str. Engr.	Erdman, Anthony Associates
Charles A. Philips Jr.	Councilman	Town of Victor
Frank Keller	Senior Sanitary Engineer	D.E.C. Avon
Michael May		Town of Irondequoit Conservation Board
G. James Schrader	Director - Building Department	Town of Perinton
Jonathan Wells	Town Planner	Town of Irondequoit
Patricia A. McElroy	Planner	Genesee/Finger Lakes Regional Planning Board
Chris Ellison	Student and Xerox Lab Assistant	Penfield Conservation Board
Howard M. Shapiro	Consulting Engineer	Lozier Inc.
John Lamb		Monroe County Planning Department
Douglas A. Fisher	Supervisor	Town of Victor
Lake B. Edwards	Supervisor	Town of Perinton - Monroe County
Ann G. Hunt	Councilwoman	Town of Perinton
Irene L. Gossin	Supervisor	Town of Penfield
Walter B. Kenyon	Member Macedon Planning Board	Macedon Town
James A. Clark	Engineer	Mendon Planning Board
George Berg	Doctor	Roch. Comm. for Sci. Info.
Timothy Downing	Dir. D.P.W.	Town of Pittsford

NAME	TITLE	ORGANIZATION
George Costich	Member	Irondequoit Town Conservation Board
Don Glondys	Project Engineer	McPhee, Smith, Rosenstein Engineers
Ann B. Nelson	Senior Environmentalist	Environmental Management Council
Bernice S. Clark		
Scott D. Sherwood	Research Analyst	Center for Governmental Research
Bruce Berry	Research Scientist	Brighton Conservation Board
John Salisbury	Engineer	Town of Henrietta
Jacky Fields		Roch. Environmental Comm.
Kenneth Peck		M.S.R. Engineers
John M. Davis	Deputy Director	Monroe County Division of Pure Waters
Robert M. Barrows	Director of Planning	Ontario County Planning
James Rhooner		West Brighton Property Owners
Schuyler F. Baldwin	Chairman	Perinton Planning Board
Robert Evans	Dep. Comm. of Public Works	Town of Brighton
Robert Burger	Commissioner	Town of Perinton
Paul E. Turner	Retired	Penfield Conserv. Com., S&W Cons. Dist.
Philip T. Packard	Engineer - Telephone	Pittsford Village
Dan Kelly		C of E
Charles Gilbert		C of E

NAME	TITLE	ORGANIZATION
John McCarthy		C of E
Phil Clark	Engineer	Clark Engineers

NCBED-PM 27 March 1978

Thomas P. Fichler, Director
Resources Program, Development
Subdivision
NYS Dept. of Environmental
Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Fichler:

Your letter of 19 January 1978 regarding modeling at Irondequoit Creek was very encouraging to me in my efforts to be of assistance to these communities within the Corps authorized study area.

Considerable work has been done since January to develop a workable and acceptable method of land use evaluation by which the objectives of the Corps, NYSDEC, and the local communities could be met. Our consultant is completing a data gathering contract this month. Also we held a public workshop meeting on 16 March in Irondequoit Creek area. Based on what we have learned, several specific alternative modeling techniques are now being considered.

Briefly, I would like to mention some of the preliminary findings that have my attention at this point:

a. The towns in the watershed generally recognize the need for better water resource planning, particularly the effects of future land development.

b. An agency such as the Monroe County Planning Department would be one possible source for operating and maintaining a land use model, with input from Ontario County.

c. The Corps could operate and maintain this model subject to approval by higher authority.

d. A watershed Policy Committee would be necessary to assure that the model is being used properly and equitably throughout the watershed and that proper land use policies are established.

e. There are several technical options available:

(1) Use a 1.15-acre grid throughout the watershed and address flood damages and several basic environmental indicators. This is the original Oconee-type model.

(2) Use a 4.5-acre grid throughout the watershed and a structural survey along the main stems. This approach would provide good flood damage analysis for perhaps 20 miles of mainstems but would only be sensitive to large land use changes (minimum 2,000-10,000 acres).

(3) Use a 1.15-acre grid system throughout, address flood damages, and provide a data base for establishing a cause and effect relationship between land use changes and water quality impacts. Other environmental indicators would be carried in the system, but in-stream water quality impacts from non-point sources would be far more in-depth. To accomplish this, sampling programs, additional gaging stations, model calibration to sampling analysis, and eventual effects on Irondequoit Bay must be considered. The Corps involvement in water quality depends on the needs expressed by NYSDEC, Monroe County Department of Health, and also by decisions of higher Corps authority. The cost of this approach is high, and calibration and verification of such models require substantial periods of time, usually measured in years.

(4) Another technical alternative is to provide the traditional Corps Flood Plain Management assistance. This includes nonstructural measures such as flood warning, evacuation, and floodproofing. It could also involve presentations by Corps personnel to the public on steps that may be taken to help lessen flood losses.

With this information in mind, I ask if NYSDEC, in conjunction with Monroe County, could develop a specific program that would satisfy your needs and also be compatible with our modeling capabilities. Of special interest to me is whether sampling and calibration of a model could be funded under Section 208, P.L. 92-500, in FY 79, and whether DEC would support a proposal for the Corps to operate and maintain a model under our Section 214 program with New York State. You may recall that we discussed the possibility of Section 208 funding support for this activity during our meeting in your office last 14 October and that

NCRED-PN
Thomas P. Eichler, Director

you expressed a tentative favorable reaction at that time. It would also be of assistance if you could identify the people in NYSDEC that we may be working with in setting up a model on this type.

At this time, I do not have approval to undertake the land use model discussed above. However, if you, Monroe County, and affected municipalities concur in its potential usefulness to the Irondequoit Creek Watershed, I will modify the Plan of Study to incorporate the model and will seek approval from my higher authority.

I offer the assistance of my staff in developing such a program and sincerely hope we all take this opportunity to promote an innovative approach to reduce the deterioration of our natural resources.

Sincerely yours,

THOMAS R. BRAUN
Lt. Col., Corps of Engineers
Deputy District Engineer

CF:
Paul Schneid, Coordinator
Avon, NY 14414
Russell C. Mt. Pleasant, Chief
Albany, NY 12233
Michael O'Toole, Director
Albany, NY 12233
NCRED-PN

NCBED-PN 22 December 1977

On 30 November 1977 a public workshop was conducted by the Corps of Engineers at the Monroe County Farm & Home Center to discuss the Irondequoit Creek study. The primary reason for the meeting was to explain a Corps program to assist in comprehensively addressing present and future flood plain management and water quality planning within the watershed.

Most of the towns in the watershed were represented as well as various State, county, and local agencies. The Corps presentation included an explanation of land use modeling techniques to address flood plain management and water quality. Enclosed is the Preface to the original Oconee study in which modeling techniques were developed by the Corps Hydrologic Engineering Center (HEC).

The value of the HEC model is its ability to rapidly and economically evaluate present and future effects of land use decisions on local or basin-wide land developments, including associated impacts on selected environmental concerns. These effects might be measured, for example, in future flood heights, sediment or nutrient loadings, or habitat values.

Planners have long recognized the need for systematically evaluating the ever more complicated process of best land use planning. Development generally goes its own way because no one can quantify the effects of that development without a sizeable expenditure. The Corps land use model was designed to quantify some of the water related effects on a continuing basis. However, the model is only a means to organize data in a businesslike fashion so that community leaders and planners have an objective base from which to make decisions. Ideally, conventional

planning techniques could do the same, but given the constraints of time and expense, the planner could rarely provide this information on an objective consequence approach.

At the meeting, a representative from New York State Department of Environmental Conservation (NYSDEC) explained how the State's 208 planning could benefit from the Corps land use modeling. The non-point sources of water pollution are difficult to address, but with this model, a base to determine a cause and effect relationship could be established.

A representative of the county of Monroe explained their water quality work. The Corps model would benefit both the county and NYSDEC programs.

A result of the meeting was an agreement to poll, via this letter, concerned agencies and communities regarding two questions:

1. Do you agree that the Corps should gather information for the purpose of estimating and defining a computer model to serve flood plain management and water quality planning in the watershed?

2. What type of committee is needed to represent the various towns, counties, and agencies concerned in the Irondequoit Creek study? Would you like to be a member of such a committee or have someone represent your interests?

I plan to have a consulting firm start a source search of available data and to make an institutional analysis. At the same time, we will be using information obtained from this poll letter and personal contacts to determine what type of committee(s) are needed to coordinate and to make decisions regarding this study.

It would facilitate our data gathering if your response to this letter indicated the material available, especially what you could provide related to the following:

1. Detailed and updated existing land use information including tax zoning maps, highway maps, aerial photography, flood plain and drainage maps, subbasin and environmental maps, resource protection areas, topography, legislation, ordinances, policies, and inventories of these.

2. Detailed future land use information including master plans or other projections that may be available.

NCBED-PN mf/2244

3. General information which pertains to existing and expected uses of natural resources, distribution of population, transportation facilities, recreation, water quality work, and agricultural practices.

Of special interest to us are people, organizations, agencies, committees, groups, etc., that could provide the above information or can make pertinent comments on the information.

I hope to be able to attend the next workshop personally to emphasize the importance of your participation in what should be a most innovative and comprehensive water resource study.

Sincerely yours,

1 Incl
as stated

DANIEL D. LUDWIG
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

McCarthy _____
Kelly _____
Baldi _____
Gilbert _____
Hallock/
Liddell _____
Braun _____
Ludwig _____

Letter sent to the following:

Lake Edwards, Supervisor
Town of Perinton
31 St. Main St.
Fairport, NY 14450

Schuyler Baldwin, Chairman
Perinton Planning Board
31 S. Main St.
Fairport, NY 14450

George Keene, Chairman
Perinton Conservation Board
31 S. Main St.
Fairport, NY 14450

Paul Spiegel, Supervisor
Town of Pittsford
11 S. Main St.
Pittsford, NY 14534

Edwin Mass, Chairman
Pittsford Planning Board
11 S. Main St.
Pittsford, NY 14534

John Fish, Chairman
Pittsford Conservation Board
11 S. Main St.
Pittsford, NY 14534

Malcolm Strong, Supervisor
Town of Victor
85 E. Main St.
Victor, NY 14564

George Day, Chairman
Cons. Advisory Council
1200 Titus Ave.
Rochester, NY 14614

Roberta Barnes, Supervisor
Masonic Temple Bldg.
Town of Mendon
Honeoye Falls, NY 14472

James A. Clark, Chairman
Mendon Planning Board
Masonic Temple Bldg.
Honeoye Falls, NY 14472

Alen Vaala, Chairman
Mendon Conservation Board
Masonic Temple Bldg.
Honeoye Falls, NY 14472

Irene Cossin, Supervisor
Town of Penfield
3100 Atlantic Ave.
Penfield, NY 14526

Lawrence Dawson, Chairman
Penfield Planning Board
3100 Atlantic Ave.
Penfield, NY 14526

James Irish, Chairman
Penfield Conservation Board
3100 Atlantic Ave.
Penfield, NY 14526

Anna Bundschuh
40 Cobbles Dr.
Penfield, NY 14526

Philip Packard, Chairman
Pittsford Planning Board
21 N. Main St.
Pittsford, NY 14534

Thomas Ryan, Mayor
City of Rochester
34 City Hall
Rochester, NY 14614

William Davis, Chairman
Rochester Env. Committee
56 Lakeshire Rd.
Rochester, NY 14612

Honorable Frank J. Horton
House of Representatives
Washington, DC 20515

Irwin King, Regional Director
NYSDEC
P. O. Box 57
Avon, NY 14414

Allan Buddle, Sr. Hydr. Engr.
NYSDEC
180 State St.
Elmira, NY 14901

Howard Gillan, Chairman
Victor Planning Board
85 E. Main St.
Victor, NY 14564

Bruce Vanderwater, Chairman
Victor Conservation Advisory Council
85 E. Main St.
Victor, NY 14564

Anthony Della Pietra, Mayor
Village of E. Rochester
314 Main St.
E. Rochester, NY 14445

Alfred Dezio, Chairman
E. Rochester Planning Board
314 Main St.
E. Rochester, NY 14445

Peter McDonough, Mayor
Village of Fairport
31 S. Main St.
Fairport, NY 14450

Joseph T. Carr, Chairman
Fairport Planning Baord
31 S. Main St.
Fairport, NY 14450

David Shepherd, Mayor
Village of Pittsofrd
21 N. Main St.
Pittsford, NY 14534

Robert Barrows, Director
Ont. Co. Planning Dept.
120 N. Main St.
Canandaigua, NY 14424

Raymond Parrish, Supervisor
Town of West Bloomfield
RD 2
Holcomb, NY 14469

Robert Peterson, Director
Wayne Co. Dept. of Planning
9 Pearl St.
Lyons, NY 14489

Wayne Scheik, Supervisor
Town of Macedon
7 Center St.
Macedon, NY 14502

Mr. James McShea
Erdman Anthony Associates
242 Andrews St.
Rochester, NY 14604

William C. Larsen, PE
44 Saginaw Dr.
Rochester, NY 14623

John Ziegler, Regional Director
Federal Insurance Administration
26 Federal Plaza
New York, NY 10007

Edward Holmes, Supervisor
Fish & Wildlife Service
NYSDEC
PO Box 57
Avon, NY 14414

Lucien A. Morin
Monroe County Manager
110 County Office Bldg.
Rochester, NY 14614

William Lochner, Supervisor
Town of Webster
1000 Ridge Rd.
Webster, NY 14580

William McGowan, Chairman
Ont. Co. Bd. of Supervisors
Courthouse
120 N. Main St.
Canandaigua, NY 14424

Homer Smith, Chairman
Ont. Co. Planning Board
120 N. Main St.
Canandaigua, NY 14424

Richard Wiles, Supervisor
Town of Brighton
2300 Elmwood Ave.
Rochester, NY 14624

Barnet Levy
Planning Board Chairman, Brighton
2300 Elmwood Ave.
Rochester, NY 14624

Kirkwood Personius, Chairman
Conservation Advisory Council
2300 Elmwood Ave.
Rochester, NY 14624

John Kelly, Supervisor
Town of Henrietta
475 Calkins Rd.
Henrietta, NY 14467

Albert Scardetta
Planning Board Chairman
475 Calkins Rd.
Henrietta, NY 14467

Mr. John Lamb
Monroe County Dept. of Planning
301 County Office Bldg.
Rochester, NY 14614

Ronald Schroeder
Comm. for Cons. of Env. Chairman
475 Calkins Rd.
Henrietta, NY 14467

Donald Deming, Supervisor
Town of Irondequoit
1280 Titus Ave.
Rochester, NY 14614

Richard Dornail, Chairman
Irondequoit Planning Board
1280 Titus Ave.
Rochester, NY 14614

Armand Piezinerill, Supt. of Pub. Works
Village of E. Rochester
314 E. Main St.
E. Rochester, NY 14445

Mr. Jery Stedinger
Cornell University
Hollister Hall
Ithaca, NY 14850

MR RICHARD BARTH
MONROE COUNTY [illegible]
COUNTY OFFICE BLDG
ROCHESTER NY 14614

MR PAUL SCHMID
NYSDEC
P O BOX 57
ALBANY 12414

[illegible]

96 COMMERCE DRIVE
LIVERPOOL NY 13088

Meeting Information

Irondequoit Creek and its tributaries enhance a very attractive watershed. The Corps of Engineers recognizes this natural resource and can consider Federal assistance to help solve such water-related problems as flood control, water quality, and recreation.

The following constitutes a framework for the meeting under which the public and interested governmental agencies can address those problems:

1. Flood Control - A schedule for providing flood control measures for Panorama Plaza will be discussed. Non-structural measures will also be considered. Other problem areas will be visited upon request from the public.

2. Land Use - Should standard land use regulations be developed especially for runoff and flood plain use? Extensive computer land use modeling and its value to planners will be discussed. This modeling can provide base data for evaluating water quality and other concerns in the watershed.

3. Recreation - The need for additional park areas and access to the Creek. Sites to benefit flood control, recreation and water quality will be discussed.

4. Water Quality - A discussion to better define the water quality problems.

Additional information will be distributed prior to the meeting. Many of the communities will be personally contacted for information related to the study.

Date 30 November 1977, 7:30 p.m.

Place Farm & Home Center, Rm II,
249 Highland Avenue, Rochester

For further information contact:

U. S. Army Engineer District, Buffalo
1776 Niagara Street, Buffalo, NY 14207
716-876-5454, extension 2244

NCBED-PN | Irondequoit Creek Summary of 11/30/77 Workshop
XX THRU: Ch, Eastern Basin | Study Manager | 1 Mar 78
Ch, Planning | McCarthy/sw/2244
Ch, Engr. Div.
✓DE

TO: Files

1. Date: 30 November 1977, 7:30 p.m. ←
Place: Farm & Home Center, Rochester
Purpose: To explain computer modeling.
Participants: NYSDEC, Monroe County, Town Supervisors and Planners, etc. (approx. 40 people).

2. Summary: Charlie Baldi chaired the meeting and John McCarthy explained the mputer modeling as per attached speech. We told the group that their specific needs .ll under flood plain management and water quality and that the best way the Corps can start to address these is through a model of the watershed. The people seemed generally in favor of this approach (excpet Bill Larsen). DEC and Monroe County spoke in favor of it.

A letter will be sent out to all the town supervisors, planning boards, etc., to get more specific reactions to computer modeling and to find those in favor of a committee to work with us.

3. Meeting closed at 10:00 p.m.

JOHN MCCARTHY
Study Manager

Irondequoit Creek Workshop

Name	Representatives
C. Baldi	Bflo. Dist., Corps of Engineers
J. McCarthy	Bflo. Dist., Corps of Engineers
D. Kelly	Bflo. Dist., Corps of Engineers
Dick Burton	Monroe County Health Dept. - Lab
Elmer Rubyner	NYSDEC Avon
Paul F. Schmied	NYSDEC Avon
Chris Ellison	Penfield Conservation Board
Richard N. Passero	W. C. Larsen Town of Perinton
John Lamb	Monroe County Planning Dept.
Ann G. Hunt	Town of Perinton
Jane M. Arseneau	Pittsford Env. Board
Tim Downing	Town of Pittsford
Henry Cornelea	Town of Henrietta
John B. Bleuk	Lozier Engineers Inc.
Chester Frederick	C.E. JA ABRAHAM
John Hubbard	Earth Sciences St. College @ Brockport
Dave Ketchum	Earth Sciences St. College @ Brockport
Joe McCue	Rochester Home Bldrs. Assoc.
Richard Wiles	Town of Brighton
W. C. Larsen	Town of Perinton
Gary Shirley	Town of Brighton
Ann Nelson Jim Hooper - Red Creek	+ 20 Others

NCBED-PN 21 September 1977

Lucien A. Morin, County Manager
County of Monroe
110 County Office Building
Rochester, NY 14614

Dear Mr. Morin:

Your letter of 16 June 1977 and our subsequent reply of 26 July 1977 generally indicate that Monroe County and the Corps of Engineers could work together in developing plans under the Irondequoit Creek Study. Since July, we have been formulating a plan that would effectively address the objectives of the study. I ask for your comments on this plan, including the following proposals and possibilities:

a. Development of Nonstructural Study Program - An engineering and environmental team would contact all agencies, counties, communities, etc. and explain Corps authority. A short review of any related studies, problems, future needs, or new legislation would be made. The work found appropriate under this study approach would comprise a supplement to our Plan of Study and endorsement would be requested from the State, counties, and towns.

b. Institutional Analysis - An institutional analysis appears especially appropriate in the study area. The network of agencies already involved is complex. The study would identify possible roles of the various agencies, as well as ongoing programs of each. The County Environmental Management Plan that is being developed may be an example of this.

c. Computer Land Use Study (Oconee) - Approval of an Oconee study by higher authority is still pending but has a high chance of approval. Local contacts would be needed to determine where and how local governments would use this planning tool for land use planning. The study itself includes a major data collection effort and it relies on local agencies for maps and other information to prepare a computer model.

d. Structural Measures - A recent damage survey at Panorama Plaza has shown that the area has very serious flood damage potential. The Corps will develop alternative plans (levees and detention ponds) to protect the area. Local groups may be opposed to some structural measures, but with good coordination, they would at least understand the consequences of leaving such an area unprotected.

e. Land Use Regulation Activities - Standard land use regulations can be developed for purposes related to the study objectives. Stormwater detention, sedimentation reduction, and expanded flood plain regulations and floodway delineation are possible regulation examples.

f. Recreation - Recreation could be a major study consideration if supported by the local people. The Corps could aid in planning the coordinated development of existing and additional parks along Irondequoit Creek for bicycle and hiking paths, picnic grounds, sport facilities and other recreational uses that could minimize future flood losses. The enclosed Buffalo Metro Study is an example of the extent that the Corps may study recreation. The Bureau of Outdoor Recreation would be involved in funding and implementation of new facilities.

g. Water Quality - The need for flow augmentation to compensate for sewer diversion is an apparent problem. A plan could be developed to address this in coordination with plans for Areawide Waste Treatment Management (Section 208). The influence of the Barge Canal or increased diversion could be made a part of the study.

h. Streambank Erosion - The extent, causes and effects of streambank erosion could be studied. Recommendations could be made for improvements.

i. Clearing and Snagging of Streams - An inventory of conditions and recommendations on clearing and snagging streams could be made.

j. Local Planning Assistance - Examples of assistance the Corps may offer to the counties or towns are given below. There are certainly many other local programs that the Corps is not yet aware of.

(1) Master plans should be reviewed for effect on the above and other water resources. The Corps could provide input into new master plans.

(2) New regulations and programs by various agencies that relate to study objectives could be reviewed by the Corps and evaluated as to how they fit into the nonstructural basin plans, for example, the 25-acre conservation plans.

I would like to emphasize that the above list is only an outline of the work that we see at this time without benefit of a coordinated input effort from all concerned. This task would be undertaken under a. above.

I suspect that if you endorse such a program by the Corps of Engineers, that the Planning Department of Monroe County would be called on to provide considerable staff planning time to the study. At least several days a month would be desirable. Possibly a meeting on this subject could be our next step.

I certainly plan to make available all resources under my authority to assure a meaningful study of the watershed. Your support is, of course, imperative.

Sincerely yours,

1 Incl
as stated

DONALD M. LIDDELL
Chief, Engineering Division

McCarthy_____
Kelly_____
Gilbert_____
Hallock_____
Liddell_____

CF:
NCBED-PN

16 Sept

NCBED-PN

16 September 1977

Thomas P. Eichler, Director
Office of Program Development
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Eichler:

Recently several officials of towns in the Irondequoit Creek Watershed have requested assistance in establishing standard land use and flood plain regulations. Under the authority of our ongoing Irondequoit Creek study, we can develop typical regulations with the cooperation of the state and local communities.

I ask that you give us information as to the role that NYSDEC could play in such an effort. I understand from informal contacts between staff members that your staff would not be able to take on additional work at this time but possibly the work could be done through my staff, consulting engineers, and your review. A local watershed commission may need to be established because of the recent fiscal cutbacks of Monroe County. I am convinced that Irondequoit Creek is an ideal location for nonstructural measures to be undertaken. Flood plain management, development of drainage regulations, and computer modeling for land management (Oconee-type studies) are the specific measures for this type of action. Study funds could be programmed for these activities if they result in a usable product of management of the flood plain.

It is my opinion that NYSDEC, the Corps of Engineers, and the local communities could join in a workable arrangement to provide all the above services for the future benefit of the watershed. I would hope that we could discuss this subject in the near future.

May I have your views?

Sincerely yours,

DONALD M. LIDDELL
Chief, Engineering Division

McCarthy _____
Kelly _____
Gilbert _____
Hallock _____
Liddell _____

CF:
NCBED-PN

ls/2244

NCBED-PN

15 July 1977

Edward D. Holmes, Regional Supervisor
Fish & Wildlife, Region #8, NYSDEC
P.O. Box 57
Avon, NY 14414

Dear Mr. Holmes:

I thank you for your letter of 21 June 1977, regarding flood management measures for Irondequoit Creek. As the potential local cooperator and affected party, your comments are very meaningful in our study.

Your concern for fish life in the Panorama Plaza area is well taken and will be addressed if a plan for channelization and levees is developed for the area. If justified, and otherwise acceptable, a channel can probably be designed which would not be detrimental to fish life. We will coordinate the development of the channel design with you.

The Oconee Computer Modeling that you refer to is under consideration by the Corps, to determine if this type of study is applicable or justifiable for the Irondequoit Creek Watershed. Certain demographic, physical characteristic, and other criteria must be met before the high cost of this modeling is considered appropriate. A decision on this matter is expected before the Fall Workshop meeting.

We are presently beginning a survey of damages at Panorama Plaza for the 100-year flood. We expect this will reveal a much more serious potential flooding problem than is now generally perceived. If this is true, then structural measures for the area will become strong economic choices.

I look forward to seeing you at our Fall Workshop.

Sincerely Yours,

KENNETH R. HALLOCK
Assistant Chief Engineering Division

CF:
NCBED-PN

McCarthy ____
Kelly ____
Baldi/
Gilbert ____
Hallock ____

NCBED-PN 30 June 1977

Paul M. Spiegel, Supervisor
Town of Pittsford
11 S. Main Street
Pittsford, NY 14534

Dear Mr. Spiegel:

I thank you for your letter of 27 May 1977 regarding the Irondequoit Creek Study. Your letter brings out several points that I would like to make comments on at this time.

It is my understanding that the "giant ever-flowing retention pond" you wrote about in your letter, refers to the largely existing condition above the Barge Canal on Irondequoit Creek. This retention pond will not be one of our first considerations under this study. Flood control appears to be very well served by the present condition of this area just above the Barge Canal. The 100-year flood outline indicates that further storage above the 100-year outline could be costly in relocations.

Help in the development of model flood plain ordinances for towns in the watershed can be a function of the Corps of Engineers but through specific requests outside of this study. Development of interior drainage control is a local responsibility. Our technical assistance is generally limited to the flood plain and to confined problem areas. The intent of this policy is to aid the communities while not being in the enforcement mode. Local drainage decision making properly belongs to the county and town governments. We do not intend to convince municipalities to "get in line" with their drainage ordinances.

What we do hope to accomplish in this study is the isolation of flood control problems and the development of alternative solutions with optimum benefits for those in the basin. Local drainage will not be studied as a purpose in itself but only as it is affected by a project along Irondequoit, Allen, or Thomas Creek.

sw/2244

NCBED-PN
Paul M. Spiegel, Supervisor

It is my intention in the next several months to see that we coordinate with your Town and others to better understand the prospects of developing a meaningful project. For this I count on your cooperation.

Sincerely yours,

KENNETH R. HALLOCK
Asst. Chief, Engineering Division

CF:
W. C. Larson, P.E.
NCBED-PN

McCarthy____
Kelly_____
Gilbert____
Hallock____
Liddell_____

bb/2244

NCBED-PN

20 June 1977

Lawrence H. Dawson, Chairman
Penfield Planning Board
3100 Atlantic Ave.
Penfield, NY 14526

Dear Mr. Dawson:

I thank you for your letter of 1 June 1977, regarding your concerns in the Irondequoit Creek Watershed Study. I regret that you were unaware of our 28 April meeting but you are on our mailing list and an announcement was sent to your attention in March.

We recognize that the town of Penfield will probably be most affected by any plan that is developed and, therefore, your support will be instrumental in this study.

Your concern for a minimal structural plan is understandable but I'm sure you realize that our designs are now generally based on providing 100-year protection, consistent with FIA policy. If a structural plan can be developed that is economically and environmentally suitable, it will then be up to you and others to decide if this design is "beyond the level which is absolutely essential."

It does appear to us that a suitable and acceptable project can evolve through the consideration of levees, channelization, and detention areas at various sites. Avoidance of the flood hazard, as you say, is a much more desirable means of reducing damages but sometimes this is not possible in cases where the flood plain has already been partially developed. In those cases, the Corps of Engineers can provide protection if justified and locally desirable.

I look forward to working closely with your Board and your Town Supervisor throughout this study and hope you feel free to contact me at any time that questions arise.

Sincerely yours,

CF:
Mrs. Irene Gossin
Penfield, NY 14526
NCBED-PN

KENNETH R. HALLOCK
Asst. Chief, Engineering Division

McCarthy _____
Kelly _____
Baldi/Gilbert _____
Hallock _____

NCSED-PN 16 June 1977

Howard J. Gillan, Chairman
Victor Planning Board
85 E. Main St.
Victor, NY 14564

Dear Mr. Gillan:

I thank you for your letter of 7 June 1977 regarding the Irondequoit Creek study and for your Town's continuing interest in matters related to flood control.

A final Plan of Study, which has been recently approved by our higher authority, is enclosed as requested. I have also enclosed the outline of our 28 April 1977 meeting.

Your opposition to structural measures in your Town is well taken. I assure you we do not intend to study such measures in the town of Victor because of your upstream location.

The last paragraph of your 7 June letter indicates that a misconception may exist concerning the Corps authority. We cannot "spearhead an effort to enact uniform laws in all affected communities." In matters of this kind, the Corps authority is strictly limited to providing technical assistance when requested by a community for a particular local water resource problem. Although a general inventory of land use policies is taken within the basin for the feasibility report, this is only an attempt to identify development practices between Towns or Counties. We can provide examples of model development plans and make general recommendations but we do not "spearhead" or even coordinate their implementation. The developmental action is undertaken by the Towns or Counties. We tried to bring this idea out at the 28 April workshop. We also stated that downstream structural measures appeared to be a viable alternative that the Corps would study further.

NCBED-PN mf/2244
Howard J. Gillan, Chairman

I hope that this will help in your understanding of our ideas and restraints and hope you call on me whenever you need to.

Sincerely yours,

2 Incl
1. POS
2. Outline of Meeting

KEN HALLOCK
Asst. Chief, Engineering Division

McCarthy_____
Kelly _____
Baldi/Gilbert _____
Hallock_____

CF:
NCBED-PN

sw/2244

NCBED-PN

16 May 1977

Dear :

On 28 April 1977, the Corps of Engineers held a workshop in Rochester to determine the general desirability of certain flood control measures in the Irondequoit Creek Watershed.

As a result of this meeting, a certain outlook was established for the study which was acceptable to the limited number of local interests present. Your review and comments are requested on the summarized study outlook attached. We have had, to date, very little meaningful local response regarding this study. I hope you will take this opportunity to evaluate your position on the subject study and forward your comments to this office.

Sincerely yours,

Incl
as stated

DONALD M. LIDDELL
Chief, Engineering Division

CF:
NCBED-PN

McCarthy ____

Kelly ____

Baldi/
Gilbert ____

Hallock/
Liddell ____

IRONDEQUOIT CREEK WATERSHED
Present Flood Control Study Outlook
May 1977

The Corps is now in the preliminary feasibility stage of this study. In this stage, the problems are clarified and alternative solutions formulated.

Originally, 20 damage areas were identified. A survey showed that most would experience only minor local drainage flood damage. Accordingly, the study is now focusing on major damage areas and those areas where specific requests for assistance have been made.

Recently it has become apparent to the local people, who have shown interest in this study, that the Corps non-structural assistance would not reduce flooding where needed. Non-structural measures cannot be used to prevent unwise development of upstream areas. Continued upstream development will invariably produce some increase in the rate of runoff to downstream communities.

The Panorama Plaza area is the most flood damageable area in the watershed. A structural plan to channelize the creek and construct levees to protect the area will be developed, including the cost-benefit ratio for this plan. The feasibility of detention areas within the parks along Irondequoit Creek will also be investigated as an alternative or in conjunction with channelization at Panorama Plaza.

All of the 20 damage areas mentioned in the Plan of Study will be addressed as to the existing flood conditions. No further study of these areas will be made unless a specific request is made by the town or village involved. Local input in this study up to now has been too sparse to properly ascertain what, if any, local needs there are in many of the damage areas.

A workshop is tentatively scheduled for the fall of 1977 to discuss the above and other coordinating activities relating to the various objectives of the study. At the fall meeting, it should be decided if there is any further Federal interest in the watershed.

The continuation or eventual termination of this study depends essentially on the response to Buffalo District in the upcoming months from local interests in the watershed.

LIST OF ADDRESSES:

Mr. John Lamb
Monroe County Dept. of Planning
301 County Office Building
Rochester, NY 14614

Richard Wiles, Supervisor
Town of Brighton
2300 Elmwood Avenue
Rochester, NY 14624

Mr. Barnet Levy
Planning Board Chairman, Brighton
2300 Elmwood Avenue
Rochester, NY 14624

Kirkwood Personius, Chairman
Conservation Advisory Council
2300 Elmwood Avenue
Rochester, NY 14624

John Kelly, Supervisor
Town of Henrietta
475 Calkins Road
Henrietta, NY 14467

Mr. Albert Scardetta
Planning Board Chairman
475 Calkins Road
Henrietta, NY 14467

Mr. Ronald Schroeder
Comm. For Cons. of Env. Chairman
475 Calkins Road
Henrietta, NY 14467

Donald Deming, Supervisor
Town of Irondequoit
1280 Titus Avenue
Rochester, NY 14614

Richard Dormail, Chairman
Irondequoit Planning Board
1280 Titus Avenue
Rochester, NY 14614

George Day, Chairman
Cons. Advisory Council
1280 Titus Avenue
Rochester, NY 14614

Squire Kingston, Supervisor
Masonic Temple Building
Town of Mendon
Honeoye Falls, NY 14472

James A. Clark, Chairman
Mendon Planning Board
Masonic Temple Building
Honeoye Falls, NY 14472

Alen Vaala, Chairman
Mendon Conservation Board
Masonic Temple Building
Honeoye Falls, NY 14472

Irene Cossin, Supervisor
Town of Penfield
3100 Atlantic Avenue
Penfield, NY 14526

Lawrence Dawson, Chairman
Penfield Planning Board
3100 Atlantic Avenue
Penfield, NY 14526

James Irish, Chairman
Penfield Conservation Board
3100 Atlantic Avenue
Penfield, NY 14526

Lake Edwards, Supervisor
Town of Perinton
31 S. Main Street
Fairport, NY 14450

Schuyler Baldwin, Chairman
Perinton Planning Board
31 S. Main Street
Fairport, NY 14450

George Keene, Chairman
Perinton Conservation Board
31 S. Main Street
Fairport, NY 14450

Paul Spiegel, Supervisor
Town of Pittsford
11 S. Main Street
Pittsford, NY 14534

Edwin Haas, Chairman
Pittsford Planning Board
11 S. Main Street
Pittsford, NY 14534

John Fish, Chairman
Pittsford Conservation Board
11 S. Main Street
Pittsford, NY 14534

Malcolm Strong, Supervisor
Town of Victor
85 East Main Street
Victor, NY 14564

Howard Gillan, Chairman
Victor Planning Board
85 E. Main Street
Victor, NY 14564

Bruce Vandervater, Chairman
Victor Conservation Advisory Council
85 E. Main Street
Victor, NY 14564

Anthony Della Pietra, Mayor
Village of East Rochester
314 Main Street
East Rochester, NY 14445

Alfred Dezio, Chairman
East Rochester Planning Board
314 Main Street
East Rochester, NY 14445

Peter McDonough, Mayor
Village of Fairport
31 S. Main Street
Fairport, NY 14450

Joseph T. Carr, Chairman
Fairport Planning Board
31 S. Main Street
Fairport, NY 14450

David Shepherd, Mayor
Village of Pittsford
21 N. Main Street
Pittsford, NY 14534

Philip Packard, Chairman
Pittsford Planning Board
21 North Main Street
Pittsford, NY 14534

Thomas Ryan, Mayor
City of Rochester
34 City Hall
Rochester, NY 14614

Beverly Vaughn, Chairperson
Rochester Planning Board
73 Dorchester Road
Rochester, NY 14610

William Davis, Chairman
Rochester Env. Committee
56 Lakeshire Road
Rochester, NY 14612

Honorable Frank J. Horton
Congressman
2229 Rayburn House Office Bldg.
Washington, DC 20515

Irwin King, Regional Director
N.Y.S.D.E.C.
P.O. Box 57
Avon, NY 14414

Allan Buddle, Sr. Hydr. Engr.
N.Y.S.D.E.C.
180 State Street
Elmira, NY 14901

John Ziegler, Regional Director
Federal Insurance Administration
26 Federal Plaza
New York, NY 10007

Edward Holmes, Supervisor
Fish & Wildlife Service
N.Y.S.D.E.C.
P.O. Box 57
Avon, NY 14414

Mr. Lucien A. Morin
Monroe County Manager
110 County Office Building
Rochester, NY 14614

Don E. Martin, Director
Monroe County Dept. of Planning
301 County Office Building
Rochester, NY 14614

Edward Seitz, Supervisor
Town of Webster
1000 Ridge Road
Webster, NY 14580

William McCowan, Chairman
Ontario County Board of Supervisors
Courthouse 120 North Main Street
Canandaigua, NY 14424

Homer Smith, Chairman
Ontario County Planning Board
120 North Main Street
Canandaigua, NY 14424

Robert Barrows, Director
Ontario County Planning Dept.
120 North Main Street
Canandaigua, NY 14424

Raymond Parrish, Supervisor
Town of West Bloomfield
RD 2
Holcomb, NY 14469

Robert Peterson, Director
Wayne County Dept. of Planning
9 Pearl Street
Lyons, NY 14489

Wayne Scheik, Supervisor
Town of Macedon
7 Center Street
Macedon, NY 14502

Mr. Larry Stid
Genesee/Finger Lakes
Regional Planning Board
County Office Bldg., Room 204
Rochester, NY 14614

Mr. James McShea
Erdman Anthony Associates
242 Andrews Street
Rochester, NY 14604

Mr. William C. Larsen, PE
44 Saginaw Drive
Rochester, NY 14623

NCBED-PN | Irondequoit Creek Workshop Summary of Meeting
XX THRU: Ch, Eastern Basin ✓ | Study Manager | 1 Mar 78
Ch, Planning Branch | McCarthy/sw/2244
Ch, Engr. Div.

TO: Files

1. Date: 28 April 1977
Place: Monroe County Farm & Home Center
Purpose: To involve the locals in the study.
Participants: See attached attendance sheet.

2. Summary: The meeting was opened by C. Baldi who outlined the scope of the meeting. J. McCarthy commented on the attached study summary and Corps outlook. There was discussion related to the limiting of structural solutions to those mentioned in the summary. It was clarified to Mr. Corneles of Henrietta that other areas for structural solutions have not been dropped. Mrs. Gossin spoke about how local, State, and Federal agencies were all avoiding the issue of increased runoff from upstream communities. Someone should enforce proper development and agricultural practices upstream - this was the thrust of her statements. C. Baldi stated that these matters are looked at during the course of the study.

R. Wade presented the Corps Flood Plain Management Program and how it is essentially outside the scope of the study.

After some discussion of FPM, the meeting returned to structural solutions. The impression was that all present felt that structural solutions are a possibility and should be studied further.

3. The reaction questions (attached) were answered and the meeting closed at 9:15 p.m.

JOHN MCCARTHY
Study Manager

IRONDEQUOIT CREEK WORKSHOP

28 APRIL 1977

AGENDA

1. UPDATE ON STUDY STATUS.

2. PRESENT CORPS OUTLOOK ON STUDY.

   A. ELIMINATION OF DAMAGE AREAS.

   B. MAIN FEASIBILITY STUDY OBJECTIVES.

   C. PUBLIC INVOLVEMENT - REACTION QUESTIONNAIRE (INCLOSED)

3. FLOOD PLAIN MANAGEMENT DISCUSSION (SEE INCLOSURES).

4. CLOSING.

Name	Representing
Charles L. Baldi	Corps of Engineers
Ken Orth	Corps of Engineers
Clement McGhan	Town of Victor
Henry K. Cornelas	Town of Henrietta
Philip T. Packard	Village of Pittsford
Ned Holmes	DEC - Region 8 - Avon
John Lamb	Monroe County Planning Dept.
John McCarthy	Corps of Engineers
Bob Wade	Corps of Engineers
Dan Kelly	Corps of Engineers
S. J. Kingston	Town of Mendon
Irene Gossin	Town of Penfield

ROCHESTER DEMOCRAT & CHRONICLE, ROCHESTER, NY - 4 APRIL 1977

Revised plan board stresse 'regional dialogue'

By BOB BICKEL

A new regional planning board would concentrate on regional communication and action rather than reviewing project proposals, according to a draft re-organization plan.

The draft, which was approved by the interim planning board at a meeting in Geneseo last week, soon will be presented to a meeting of legislators representing the eight counties in the region.

To take effect, the re-organization plan must be approved by majority votes of the governing bodies of all member counties.

Under the old Genesee-Finger Lakes Regional Planning Board, top priority was given to reviewing local projects, providing technical assistance to member counties and performing studies.

But, according to the plan, these duties will take a back seat to encouraging "regional dialogue and action."

The size of the staff isn't spelled out in the plan, but the plan refers to a relatively small, "streamlined" staff in which the director would do much of the work.

"The last thing I want is a Cecil B. DeMille production," interim director Graham Cox said.

Several provisions, such as a prohibition against starting any project until all local funds are committed, are intended to prevent financial practices which led to the downfall of the former board. The board was disbanded last year after accumulating a $1.3 million deficit.

During the first year, the council would have a budget of $70,955.02, less than Monroe County's share of the previous board's budget. The proposed budget would be contributed by the eight counties as follows: $23,712.33 from Monroe; $5,253.63 each from Yates, Seneca and Orleans; and $7,020.45 each from Genesee, Livingston, Ontario and Wayne.

Based on 1970 population figures, the board would consist of eight county board of supervisors or legislature chairmen and the mayor of Rochester, nine citizen representatives from the eight counties and the city, appointed by their governing bodies; one additional county legislature member from Genesee, Livingston, Monroe, Ontario and Wayne counties; a representative from the town supervisors association and the village mayors association in Monroe County, and the Monroe County and City of Rochester managers.

Members would serve three-year terms without pay.

D. KELLY - 1

NCBED-PN /Irondequoit Creek Steering Committee Meeting
XX THRU: Ch, Eastern Basin Project Manager 1 Mar 78
Ch, Planning Branch McCarthy/sw/2244
Ch, Engr. Div.

TO: Files

1. Date: 16 December 1976, 7:30 p.m. (See Attachment).
Place: Monroe County Farm & Home Center
Purpose: To hear FIA speaker.
Participants: See attached list for previous meeting.

2. Summary: Mr. John Ziegler, Regional Director of the Federal Insurance Administration, explained the FIA program and how it can assist in flood control. Meetings with all the towns in the basin are scheduled over the next several months to allow the locals to comment on the proposed flood insurance maps.

The attached announcement for the upcoming Corps Workshop was made. It was brought out that the Corps flood plain management program is no more than the incorporation of the FIA program, in this case, unless the need for some additional service is identified.

During questions it was brought out that structural solutions may not be acceptable but they would still be developed to some degree during this study. Only the town of Henrietta mentioned that structural work could be acceptable. I mentioned that it seemed to me that no one wants improvements but just to keep flooding conditions from getting worse. Mrs. Gossin and the others agreed.

3. The meeting adjourned at 10:00 p.m.

JOHN MCCARTHY
Project Manager

IRONDEQUOIT CREEK WATERSHED STUDY

Meeting Minutes
December 16, 1976

PRESENT

Watershed Community Representatives

Brighton:	George Gardner, Planning Board
East Rochester Village:	Armond Pizzingrilli
Fairport Village:	Maurice Rasbeck, Public Works Superintendent
Henrietta:	Henry Cornelius, Town Engineer
Irondequoit:	George Day, Conservation Board Chairman
Mendon:	Jim Clark, Planning Board Chairman
Penfield:	Irene Gossin, Supervisor Bob Fuller, Director of Public Works
Perinton:	James Smith, Assessor Robert Burger, D.P.W. Commissioner
Pittsford:	Tim Downing, Department of Public Works James McGarigle, Environmental Board
Rochester City:	Neil Freedland, Environmental Planner, DCD
Victor:	Malcolm Strong, Supervisor Kirby Milton, Planning Board
West Bloomfield:	Raymond Parrish, Supervisor Jim Tubbs

Staff

Monroe County Department of Planning:	John Aughenbaugh John Lamb
United States Army Corps of Engineers:	John McCarthy

Visitors

Larsen Engineers	William Larsen
Ontario County Planning Department:	Norman Jensen
New York State Department of Environmental Conservation:	Ned Holmes William McGregor

Visitors

Monroe County Environmental Management Council: Gary Olin

Monroe County Department of Public Works: Richard Laws
Robert Oertel

Monroe County Department of Health: John Felsen
Richard Burton

Ontario County Planning Department: Norman Jensen

New York State Department of Environmental Conservation: William McGregor
Frank Keller

NCBED-PN

Organizational Meeting on the Irondequoit Creek Study by the Watershed Steering Committee

XX THRU: Ch, Eastern Basin — Project Manager — 1 Mar 78
Ch, Planning Branch — McCarthy/sw/2244
Ch, Engr. Div.

TO: Files

1. Date: 18 November 1976, 3:00 p.m. (See Attachment).
Place: Monroe County Farm & Home Center
Purpose: To organize a steering committee.
Participants: See Attachment

2. Summary: Mr. Paul Gaume, Corps of Engineers, showed slides and explained Section 404 of the Federal Permit Program. Mr. McGregor and Mr. Keller from DEC explained their corresponding program.

Mrs. Irene Gossin made a motion, which was unanimously passed that a steering committee be formed with each municipality being represented by a member to be named prior to the next meeting. It should be noted that all the towns in Monroe County that are involved in this study were present. Most of the discussion involved flood insurance and it was noted that all the municipalities are enrolled in the Federal Flood Insurance Program. However, the insurance rate maps will not be available until next spring. The next meeting will be on 16 December 1976 and will address questions on flood insurance with a presentation by a HUD speaker.

3. The meeting adjourned at 5:00 p.m.

JOHN MCCARTHY
Project Manager

NOTICE OF MEETING

IRONDEQUOIT CREEK
WATERSHED STUDY

There will be a meeting at the Monroe County Farm and Home Center, Meeting Room 1, 249 Highland Avenue, Rochester, New York, on Thursday, November 18, 1976, at 3:00 P.M.

SUBJECTS: 1. Federal and State Permit Programs
2. Establishment of Watershed Steering Committee

1. As of July 1, 1977, the United States Army Corps of Engineers will have authority to regulate discharge of dredged or fill material in all waters of the United States according to the provisions of Section 404 of the Federal Water Pollution Control Act. This may affect development activity in the Irondequoit Creek Watershed and watershed community representatives should become more familiar with the program.

Toward this end, the Corps of Engineers Chief of Regulatory Functions (Permits) Paul Gaume will discuss the Corps' jurisdiction, authority, and implementation timetable of Section 404. Additionally, the New York State Department of Environmental Conservation will explain its own activities under Article 15 (Protection of Waters) and Article 36 (Construction in Flood Hazard Areas) of the New York State Environmental Conservation Law.

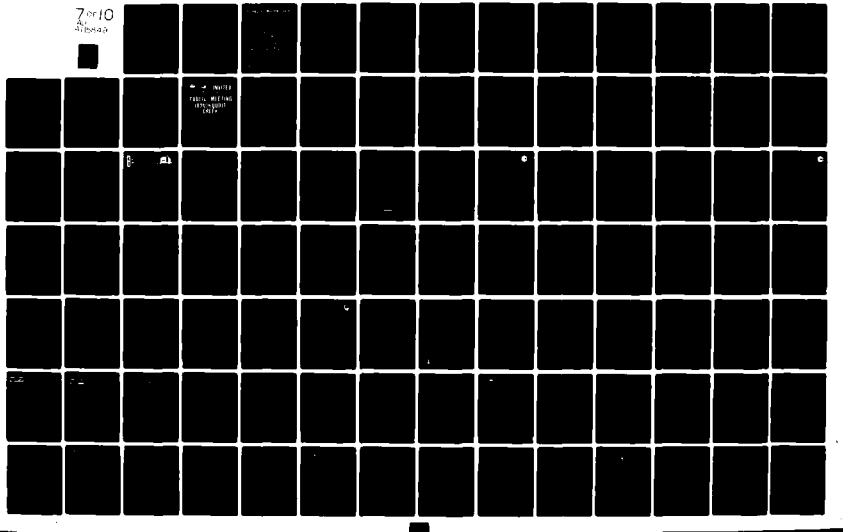
2. The aspects of federal and state permit activity regarding flooding, erosion, and sedimentation may have a significant impact on potential development in the Irondequoit Creek Watershed. In order to maintain local awareness and input into the decision-making process, the establishment of a steering committee of watershed communities is proposed. It is therefore strongly urged that a spokesman for each affected community be present to indicate the position of the community and to participate in the watershed study activity.

Due to the importance of the subject, watershed communities may wish to invite the attendance of their local engineer. In addition, anyone interested is invited to attend.

JHA:ja
11/76

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL



Visitors

Monroe County Environmental Management Council:	Gary Olin
Monroe County Department of Public Works:	Richard Laws Robert Oertel
Monroe County Department of Health:	John Felsen Richard Burton
Ontario County Planning Department:	Norman Jensen
New York State Department of Environmental Conservation:	William McGregor Frank Keller

1. John Aughenbaugh briefly outlined the Irondequoit Creek Study now under way and introduced guest speakers Paul Gaume of the U. S. Army Corps of Engineers and William McGregor and Frank Keller of the New York State Department of Environmental Conservation. They respectively indicated the responsibilities of the federal and state governments regarding existing and proposed permit granting activity. It was emphasized that municipal inputs were given highest priority in reviews and permit granting, and that this would continue as overview analyses are provided.

2. The motion was made by Mrs. Gossin and seconded by Mr. Wiles that an Irondequoit Creek Watershed Steering Committee be formed. The motion was passed unanimously. A second motion was made by Mrs. Gossin and seconded by Mr. Gardner to have affected municipalities appoint an official member and an alternate member of the committee. This motion also passed unanimously. The Monroe County Department of Planning Staff will advise all affected municipality heads of this and request names of the designees.

   The fourteen (14) affected municipalities -- indicated on the attached map -- are:

   Brighton (M)
   East Rochester Village (M)
   Fairport Village (M)
   Henrietta (M)
   Irondequoit (M)
   Macedon (W)
   Mendon (M)
   Penfield (M)
   Perinton (M)
   Pittsford (M)
   Pittsford Village (M)
   Rochester, City of (M)
   Victor (O)
   West Bloomfield (O)

   (M) = Monroe County
   (O) = Ontario County
   (W) = Wayne County

3. Each of the watershed communities is affected by the national flood insurance program mandated by the Flood Disaster Protection Act of 1973. In order to promote better understanding of the program and its impacts, the U.S. Department of Housing and Urban Development Flood Insurance Administration will provide a program speaker at the December 16 evening meeting.

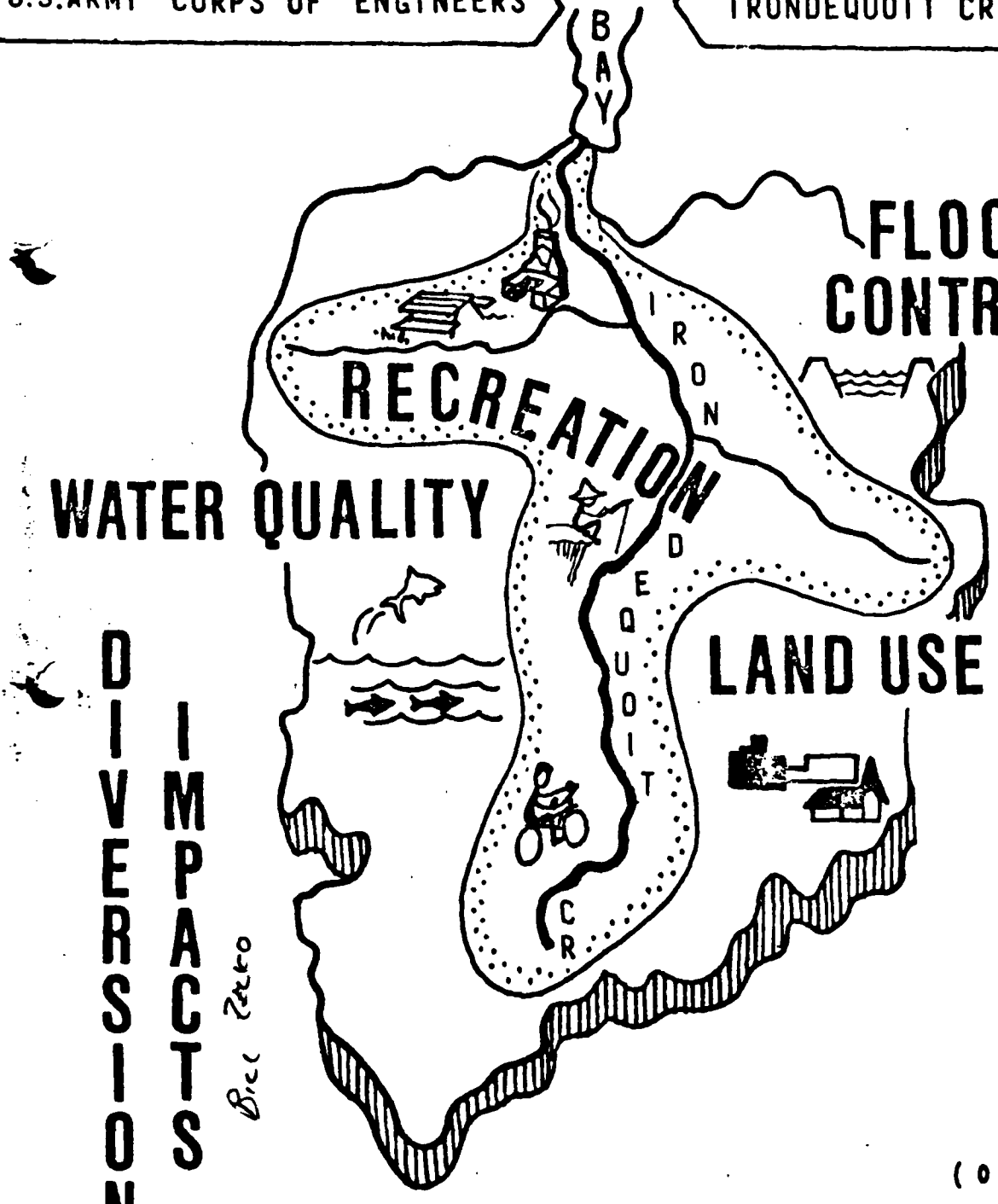
JHA/cm
11/24/76

YOU ARE INVITED TO A

PUBLIC WORKSHOP

U.S.ARMY CORPS OF ENGINEERS

IRONDEQUOIT CREEK STUDY



DIVERSION IMPACTS

Bike Route

(OVER)

IRONDEQUOIT CREEK WATERSHED STUDY

Meeting Minutes
18 November 1976

PRESENT

Watershed Community Representatives

Brighton: Richard Wiles, Supervisor
Gary Shirley, Building Inspector
John Laird, Commissioner of Public Works
Jane Schmidt, Conservation Board
George Gardner, Planning Board

Fairport Village: Maurice Rasbeck, Public Works Superintendent

Henrietta: Henry Corneles, Town Engineer

Irondequoit: George Day, Conservation Board Chairman
Al Lathrop, Conservation Board

Macedon: Walter Kenyon, Planning Board

Mendon: Squire Kingston, Supervisor
Robbie Barnes, Town Board

Penfield: Irene Gossin, Supervisor

Perinton: James Smith, Assessor

Pittsford: Tim Downing, Department of Public Works
James McGarigle, Environmental Board

Pittsford Village: Philip Packard, Planning Board Chairman

Victor: Malcom Strong, Supervisor
Kirby Milton, Planning Board

West Bloomfield: Raymond Parrish, Supervisor

Staff

Monroe County Department of Planning: John Aughenbaugh
John Pettis

United States Army Corps of Engineers: William Zoeller
John McCarthy
Paul Gaume

Visitors

Monroe County Environmental Management Council: Gary Olin

Monroe County Department of Public Works: Richard Laws
Robert Oertel

Monroe County Department of Health: John Felsen
Richard Burton

Ontario County Planning Department: Norman Jensen

New York State Department of Environmental Conservation: William McGregor
Frank Keller

N-O-T-I-C-E O-F M-E-E-T-I-N-G

IRONDEQUOIT CREEK
WATERSHED STUDY
STEERING COMMITTEE

TO: Potential Committee Members and Interested Persons

FROM: Monroe County Department of Planning

DATE: Thursday, October 21, 1976, 3:00 p.m.

PLACE: Monroe County Farm and Home Center
Meeting Room 1
249 Highland Avenue
Rochester, New York

SUBJECT: COORDINATION

1. Purpose of Watershed Study
2. Scope of Study
3. Role of Participants
4. Establishment of Steering Committee

JHA/cm
10/76

Coordination Meeting on the Irondequoit Creek Study by
the Watershed Steering Committee

1. Date: 21 October 1976

2. Place: Monroe County Farm and Home Center
Rochester, NY

3. Purpose: To organize a Watershed Steering Committee

4. Participants: See attached

5. Summary: The meeting was chaired by Mr. John Augenbaugh of the Monroe County Department of Planning. Mr. Augenbaugh explained that Monroe County was only to act as a coordinator for the locals on this project. He then turned the meeting over to the locals whereupon Mrs. Irene Gossin essentially began to chair the meeting. Mrs. Gossin was disappointed in the turnout for this meeting and convinced those present that nothing could be accomplished without far more representation. It was agreed that more interest could be developed among the locals if at the next meeting speakers were set up on the permit programs of C of E and DEC. It was envisioned by Mrs. Gossin, and agreed by the others, that after the permit speakers an attempt would be made to organize a steering committee with proper representation from all the locals.

6. A tentative format of the next meeting is adjourned.

7. The meeting adjourned at 5:00 p.m.

IRONDEQUOIT CREEK WATERSHED STUDY

Meeting Minutes
October 21, 1976

PRESENT

Watershed Community Representatives

Brighton: Richard Wiles, Supervisor
Gary Shirley, Building Inspector
John Laird, Commissioner of Public Works
Kirkwood Personius, Conservation Advisory Council Chairman

Mendon: Squire Kingston, Supervisor

Penfield: Irene Gossin, Supervisor
Katharine Zarik, Conservation Board Member

Perinton: James Smith, Assessor
George Koene, Conservation Board Chairman

Victor: Kirby Milton, Planning Board

Staff

Monroe County Department of Planning: John Aughenbaugh
U.S. Army Corps of Engineers: William Zoeller
John McCarthy

Visitors

Monroe County Division of Pure Waters: John Davis
Ontario County Planning Department: Norman Jensen

1. John Aughenbaugh said the Monroe County Department of Planning functions in the Watershed Study will be to:

   (a) Provide liaison between the Corps of Engineers and Watershed Community representatives to coordinate informational activities.

   (b) Update the Irondequoit Creek Linear Park Plan to identify lands that have been developed, acquired, and what land is available for park purposes.

2. The need for further informational activity to describe the impact on potential development in the watershed by public agencies was discussed. As the Army Corps of Engineers is to expand its authority (Sec. 404 of the Federal Water Pollution Control Act) to regulate disposal of dredged or fill material, via permit procedure, over all waters in the United States by July 1, 1977, the considerable potential impact on watershed development should be noted. It was therefore requested that the Corps of Engineers prepare a persuasive letter about potential impact to all affected municipalities regarding the procedure. This would be followed by a meeting of concerned communities on or about November 18, 1976, to hear a descriptive analysis of the program by a Corps representative. Considering the significant interest in the permit procedure, the Corps of Engineers "Problems" meeting will be deferred until December of 1976.

   Representatives present also want to have presentations of federal requirements regarding development in flood hazard areas as defined in the National Flood Insurance Program, and sewerage in the Irondequoit Creek Watershed. Speakers on these subjects will be obtained by the Monroe County Department of Planning.

3. It was indicated that regional emphasis on the three-county watershed area may be a positive step in coordinating activity. Thus, the newly re-established Genesee/Finger Lakes Regional Planning Board will be advised of the study and invited to participate.

21 October 1976 - Attendance

Richard Wiles, Supervisor and 3 staff members
Town of Brighton

Squire Kingston, Supervisor
Town of Mendon

Irene Gossin, Supervisor and staff member
Town of Penfield

Lawrence Dawson, Chairman
Penfield Planning Board

Jim Smith, Supervisor
Town of Perinton

George Keene, Chairman
Perinton Conservation Board

John Augenbaugh and two other staff members
Monroe County Planning Board

William Zoeller, John McCarthy
U.S. Army Corps of Engineers

Minutes of the Public Workshop for the
Irondequoit Creek Study held 8/24/76

On 24 August 1976 at 7:30 p.m., a public workshop was held at the Brighton Town Hall concerning the Corps of Engineers Study for flood control and allied purposes within the Irondequoit Creek Watershed.

The history of the study and the Corps policy pertaining to the study efforts were explained by Corps representatives. The main purpose of the meeting was to help identify the existing and potential water resource related problems and needs, and associated alternative solutions for flood control and allied purposes.

The workshop was the first of the many planned and anticipated workshops that will be held throughout the study.

The main concern established at the workshop was that the need existed for better land management throughout the Irondequoit Creek Watershed. Many of the Town's representatives are going to take it upon themselves, through the Monroe County Planning Department, to set up a steering committee to help coordinate activities during the study and to make sure that all affected townships are active in the study. The Corps of Engineers will participate as technical advisors as requested.

It was promised that within the next two months field trips will be made by Corps personnel to each affected township to gather and develop all useful information pertaining to flood control and allied purposes such as erosion, sedimentation, recreation, and environmental concerns. Additional workshops will be held shortly thereafter with the local steering committee when established, along with other agencies and groups such as Soil Conservation Service and NYS Department of Environmental Conservation to further coordinate study objectives and procedures.

No specific problems or needs were identified at the meeting except for the need to have all townships involved and educated towards better land management usage.

PUBLIC WORKSHOP
IRONDEQUOIT CREEK
24 AUGUST 1976

NAME	REPRESENTING
Jeanne B. Hutchins	Brighton Councilwoman
Louis P. DeVoe	John Stainton, Commissioner Rochester Department of Community Development
Trudy A. Pangretisch	Monroe County Planning Department
Irene Gossin	Supervisor-Town of Penfield
John H. Aughenbaugh	Monroe County Planning Department
Richard Dymsza	Monroe County Planning Department
Jack Buholtz	Wm. Larsen, P.E., P.C.
M. A. Tanner	Town of Irondequoit
Robert Scott	NYS Department Environmental Conservation
William A. Locus	Councilman, Brighton
Richard Wiles	Supervisor - Town of Brighton
Squire G. Kingston	Supervisor - Town of Mendon
Al Kassel	Director of P.W., Town of Pittsford
John Laird	Commissioner DPW, Town of Brighton
M. Miller	Councilman Town of Brighton
Wm. Zoeller	Corps of Engineers
Dan Kelly	Corps of Engineers
Ken Orth	Corps of Engineers
Charles Baldi	Corps of Engineers

1c/2245

NCBED-PN

12 August 1976

Dear :

The purpose of this letter is to follow up on our request for comments regarding the Buffalo District Draft Plan of Study for flood control and allied purposes in the Irondequoit Creek Watershed, NY. The draft plan of study was sent to you in early June 1976 by my predecessor, Colonel Bernard C. Hughes.

I want to insure that all interested individuals and agencies have an opportunity to express their concerns and opinions concerning this study. The Irondequoit Creek Study, as with the other Corps of Engineers studies which address water resources problems, is undertaken to develop solutions which promote economic development and enhance environmental quality both in the study area and in the nation as a whole. To properly achieve this goal, the interest and needs of citizens and communities must be identified. Further, close coordination with local, State and Federal agencies is necessary.

I would appreciate hearing from you in this regard so that I may incorporate your comments in the Final Plan of Study. A self-addressed envelope is provided for your use. Your response by 27 August 1976 would significantly assist us in our task.

If you have any questions regarding this study, please contact my study manager, Mr. William Zoeller, at 716-876-5454.

Sincerely yours,

DANIEL D. LUDWIG
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

Zoeller _____
Kelly _____
Gilbert _____
Hallock _____
Liddell _____
Walker _____
Ludwig _____

Orin Lehman, Commissioner
NYS Parks and Recreation
303 South Swan St. Bldg.
Albany, NY 12223

Alvan Grant, Director
Monroe County Parks Dept.
375 Westfall Road
Rochester, NY 14620

Robert Collins, Director
Monroe Co. Env. Management Council
33 South Washington Street
Rochester, NY 14608

Donald Deming, Supervisor
Town of Irondequoit
Town Hall
1280 Titus Avenue
Irondequoit, NY 14617

Paul Spiegel, Supervisor
Town of Pittsford
11 South Main Street
Pittsford, NY 14534

Squire Kingston, Supervisor
Town of Menden
[redacted] Masonic Temple Building
Honeoye Falls, NY 14472

John Kelly, Supervisor
Town of Henrietta
475 Calkins Road
Rochester, NY [redacted] 14467

Mr. William C. Larsen
44 Saginaw Drive
Rochester, NY 14623

Chairman, Sierra Club of Rochester
45 Parker Drive
Pittsford, NY 14534

Director
Ontario Co. Planning Board
120 North Main Street
Canandaigua, NY 14425

Lake Edwards, Supervisor
Town of Perinton
31 South Main Street
Fairport, NY 14450

LETTER WAS SENT TO THE FOLLOWING:

Mr. Robert Hilliard
State Conservationist
Soil Conservation Service
Room 400
700 East Water Street
Syracuse, NY 13210

Willard Cole, Area Supervisor
U.S. Fish and Wildlife Service
Federal Building
Cortland, NY 13045

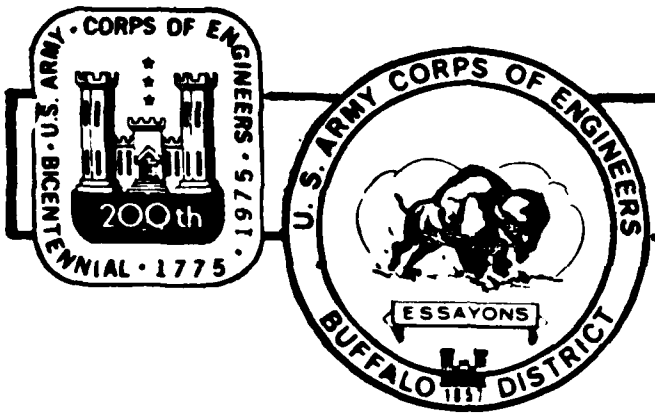
Mr. Anthony M. Corbisiero
Bureau of Outdoor Recreation
Northeast Regional Office
Federal Office Building, Room 9510
600 Arch Street
Philadelphia, PA 19106

Mr. Robert L. Flint
Environmental Protection Agency
Box 5036
Rochester, NY 14627

Peter A. Berle, Commissioner
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, NY 12233

Irwin King, Regional Director
NYS Dept. of Environmental Conservation
P.O. Box 57
Avon, NY 14414

Raymond T. Schuler, Commissioner
NYS Dept. of Transportation
1220 Washington Avenue
Albany, NY 12226



you are INVITED to a

PUBLIC MEETING

on **IRONDEQUOIT CREEK**

At: 7:30 PM on Monday, June 14, 1976

Room 241, Penfield High School, High School Drive, Penfield, New York

Purpose: TO DISCUSS POSSIBLE MEASURES FOR FLOOD MANAGEMENT AND RELATED WATER AND LAND RESOURCES NEEDS IN THE IRONDEQUOIT CREEK BASIN. PLEASE TELL INTERESTED PERSONS ABOUT THIS MEETING. ATTACHED IS A COPY OF THE DRAFT PLAN OF STUDY FOR YOUR REVIEW AND COMMENT. PLEASE PROVIDE ANY WRITTEN COMMENTS TO THE BUFFALO DISTRICT OFFICE BY 16 JUNE, OR AT THE PUBLIC MEETING, ALONG WITH ANY ORAL COMMENTS.

FOR ADDITIONAL INFORMATION CONTACT:

BUFFALO DISTRICT
U.S. ARMY CORPS OF ENGINEERS
1776 NIAGARA STREET - BUFFALO, NEW YORK, 14207
(716) 876-5454, EXT. 234

mf/2245

NCBED-PN

29 June 1976

Mr. John H. Bundschuh
1590 Harris Road
Penfield, NY 14526

Dear Mr. Bundschuh:

This is in reply to your letter dated 21 June 1976 concerning flooding problems along Commission Ditch.

Flooding problems along Commission Ditch will be considered during our study of flood management requirements for the Irondequoit Creek Watershed. During July and August 1976, my staff will conduct several workshop meetings and make field investigations to better identify the flood control problems and associated needs within the Irondequoit Creek Watershed. A member of my staff will contact you to discuss, in detail, your concerns on the Commission Ditch.

I would like to emphasize that it will take a number of years for any flood management project that the Irondequoit Creek Study might recommend to actually be constructed. Inclosed for your information is a pamphlet that describes the Civil Works project process. We are currently at Step 5. Therefore, local efforts with technical assistance from my office may prove to be the most advantageous way to solve your flood problems.

Inclosed are your slides of Commission Ditch which I am returning as requested. Thank you very much for making them available.

Sincerely yours,

Incl
as stated

BERNARD C. HUGHES
Colonel, Corps of Engineers
District Engineer

CF:
NCBED-PN

Zoeller
Kelly
Gilbert
Hallock
Liddell
Walker
Hughes

PUBLIC MEETING

IRONDEQUOIT CREEK

held at

Room 241, Penfield High School

High School Drive

Penfield, New York

taken on

Monday

June 14, 1976

at

7:30 P.M.

APPEARANCES:

LT. COLONEL BYRON G. WALKER,
Deputy District Engineer,
Corps of Engineers.

CHARLES BALDI,
Assistant Chief Planning Branch,
Corps of Engineers.

JOHN ZORICH,
Basin Manager,
Corps of Engineers.

APPEARANCES: Cont'd.

WILLIAM ZOELLER,
Study Manager,
Corps of Engineers.

KENNETH ORTH,
Corps of Engineers.

ROSS FREDENBURG,
Public Affairs Officer,
Corps of Engineers.

THOMAS FRIDMANN,
Photographer for Buffalo District,
Corps of Engineers.

S P E A K E R S

	PAGE
SUSAN WARNER - Representing County Legislator Gene Mazzola	12
IRENE L. GOSSIN - Supervisor, Town of Penfield	13
JOSEPH WILLMES - Director of Monroe County Soil & Water	20
KIRBY M. MILTON - Victor Planning Board	22
FRANK J. KELLER - Department of Environmental Conservation - Avon	26
GEORGE R. COSTICH - - -	28
HERMAN S. FOREST- Scientist	32
DR. S. B. CLARK - Commission Ditch Association	42
RICHARD WILES - Supervisor, Town of Brighton	49
JAMES J. TRYBALSKI - - -	60

ATTENDEES

C. Bergman - 597 Concord Dr. - Webster, N.Y. 14580

N. Bergman - 597 Concord Dr. - Webster, N.Y. 14580

John Bundschuh - 1590 Harris Rd. - Penfield, N.Y. 14526

Bob Burger - Town of Perinton - Comm. of Public Wks.

Irwin Brodell - 299 Thornell Rd. - Pittsford, N.Y. 14534

LaVern R. Celestino - 44 Saginaw Dr. - Rochester, N.Y. 1461

Dr. S. B. Clark - 1750 Salt Rd. - Fairport, N.Y. 14450

George R. Costich - 309 Avondale Rd. - Rochester, N.Y. 14622

Mr.& Mrs. W. Cowgill- Rail Road Mills - Pittsford 14534

G. Dalmath - WHEC T.V. - Rochester, N.Y.

Lowell Dewey - 44 Saginaw Dr. - Rochester, N.Y. 14623

Tim Downing - 11 South Main St. - Pittsford, NY.

Herman S. Forest - 19 Genesee Park Blvd. - Rochester 14611

Robert H. Fuller - Box 97 - Penfield, N.Y. 14526

P. Gordon - 35 Knollwood Dr. - Rochester, N.Y. 14618

Irene L. Gossin - 17 Parkview Dr. - Rochester, N.Y. 14625

Gerald J. Henderson - 480 Stattle Rd. - Scottsville, N.Y. 14546

J. H. Irish - 1726 Jackson Rd. - Penfield, N.Y. 14526

John F. Karle - 44 Saginaw Dr. - Rochester, N.Y. 14623

Frank J. Keller - Box 57 D.E.C. - Avon, N.Y. 14414

Dr. F. A. Klipstein- 42 Knollwood Dr. - Rochester, N.Y. 14518

ATTENDEES

John Laird - 99 Alaimo Dr. - Rochester, N.Y. 14625

William C. Larsen - 6 Woodstach Lane - Pittsford, N.Y. 14534

John Maume - 475 Norris Dr. - Rochester, N.Y.

Martha McAdam - 34 Trowbridge - Pittsford, N.Y.

Gary B. Olin - 405 County Office Bldg. - Rochester, N.Y.
Environmental Management Council

P. T. Packard - 3 Greenhill Lane - Pittsford, N.Y. 14534

Trudy A. Pangretisch - c/o Monroe County Dept. of Planning
39 West Main St. - Rochester, N.Y. 14607

Robert C. Plecash - 50 Chestnut Plaza - Rochester, N.Y. 14604

Ken Ruedin - 3044 Bay Front So. - Rochester, N.Y. 14622

Jane Schmidt - 3021 Elmwood Ave. - Rochester, N.Y. 14618

Howard M. Shapiro - 44 Musket Lane - Pittsford 14534

James J. Trybalski - 300 Bremen St. #4 - Rochester, N.Y. 14621

Paul E. Turner - 1815 Sweets Corners Rd. - Fairport 14450

Allan Wolk - 33 Knollwood Dr. - Pittsford 14618

Susan Warner - 1226 Bay Shore Blvd. - Rochester 14609
Gene Mazzola, Monroe County Legislator

Richard D. Wiles - 2300 Elmwood Ave. - Rochester, 14618

John D. Williams - 79 Farm Brook Dr. - Rochester 14625

Joseph Willmes - 1320 Sweets Corners Rd. - Penfield, N.Y.

Michael H. Yeaw - 48 Manorshire Dr. - Fairport, N.Y. 14450

CORPS OF ENGINEERS BUFFALO DISTRICT

ROCHESTER, NY, TIMES - UNION - 18 Feb 76

Heavy Rains Renew Threat of Flooding in Area

By NANCY KREISLER

Swollen creeks and rivers which began to subside yesterday were on the rise again early this morning as a new rainstorm moved into the area.

Several counties surrounding Monroe reported some road closings and wet basements in low-lying areas. But the hardest-hit Western New York community was the resort area of Sunset Bay in Chautauqua County on the shore of Lake Erie where 400 persons have been evacuated.

The National Weather Service issued a flash flood watch early this morning for Oatka and Black Creeks. Officials in LeRoy, Genesee County, reported some flooding yesterday as Oatka Creek overflowed its banks. But early this morning officials said that while the creek was still high, no homeowners had been evacuated.

In Honeoye Falls, another ice jam caused some flooding near Ontario Street. That problem was alleviated, however, when the jam broke late yesterday afternoon.

In Livingston County, flooded roads continued to be a problem early this morning. Route 258 in Groveland was still closed, as well as Pioneer Road, north of Groveland Station. Pioneer Road is a dirt road, but reportedly heavily traveled. Route 63 between Dansville and Groveland Station, which was closed for a time yesterday, has been reopened, police said.

In Wyoming County, police reported that they were carefully watching the upper Genesee River near Portageville for possible flooding conditions, but none had been reported yet.

Seneca County police reported that Route 105 between Routes 101 and 89 in the town of Tyre was closed last night. The road is in a swampy area where water and ice are causing the problems.

Steuben County reported that Route 352 was closed near the Steuben-Chemung County line in an area near a creek. Many residents in Bath also reportedly needed the help of the fire department yesterday to pump out wet basements.

Fire officials in Lyons, Wayne County, said the water in the Barge Canal was at the top of the banks and could begin to overflow if the rain continued. But the officials said there were few homes there.

Also in Wayne County, State Highway 14 south of the Town of Lyons, was reported to be surrounded by water from the Canandaigua outlet, but not yet flooded over.

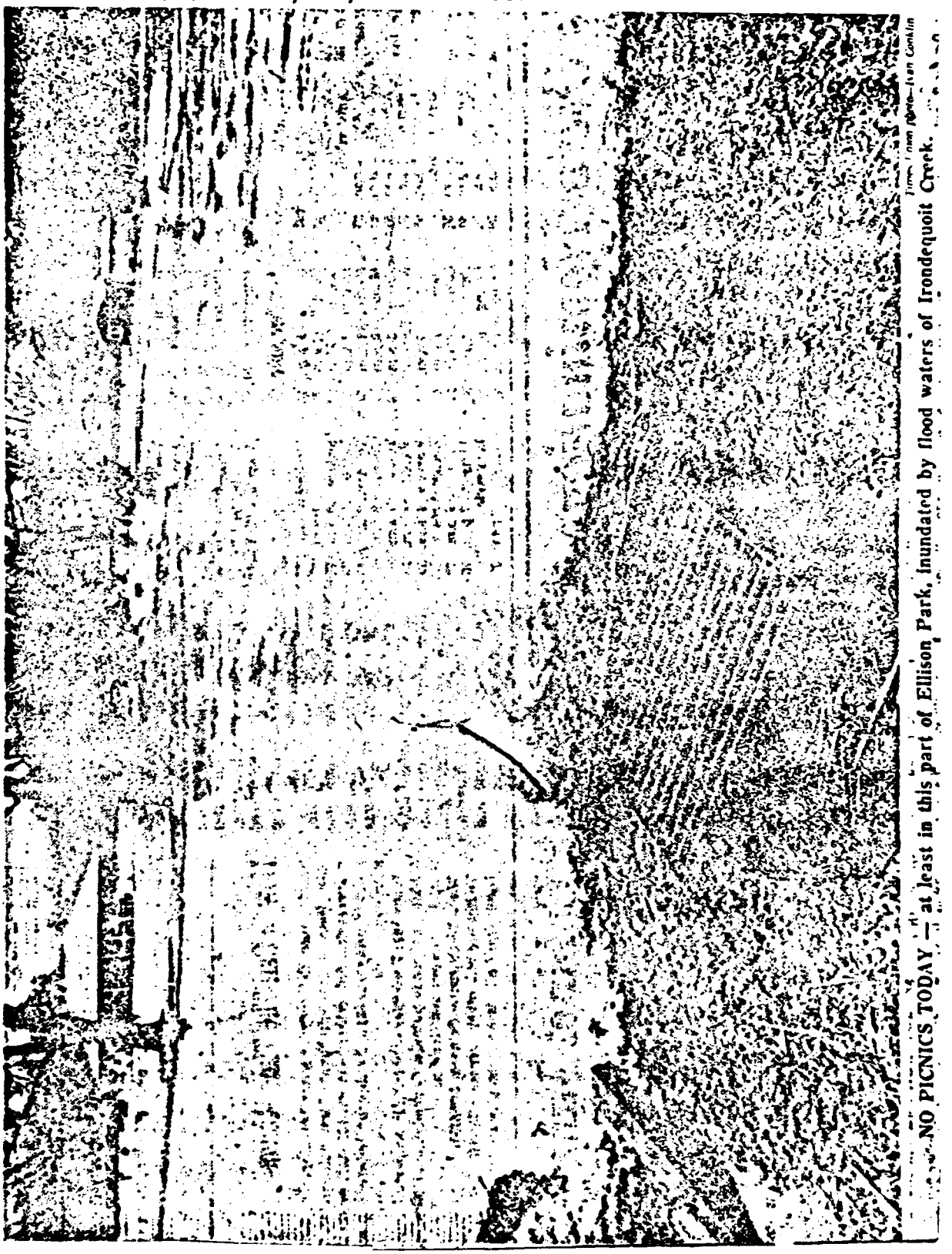
A section of Route 81 south of Syracuse was also reportedly closed for a time.

Civil Defense supervisors in Salamanca, Cattaraugus County, were carefully watching the situation there. Authorities said no one had been asked to evacuate yet, however.

The National Weather Service issued a flash flood watch for the Southern Tier counties and forecast moderate to heavy rain at times. But authorities there said no serious problems had yet been reported.

CORPS OF ENGINEERS BUFFALO DISTRICT

ROCHESTER, NY, TIMES-UNION - 18 Feb 76



NO PICNICS TODAY — at least in this part of Ellison Park, inundated by flood waters of Irondequoit Creek.

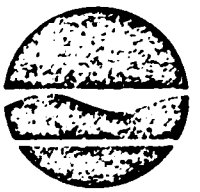
FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX G
REPORT AND VIEWS
OF OTHER AGENCIES

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233
Division of Regulatory Affairs, Room 514



Robert F. Flacke
Commissioner

May 27, 1981

George P. Johnson, Colonel
District Engineer
Department of the Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

RE: Final Feasibility Report and Environmental Impact Statement, Irondequoit Creek Watershed, DEC #828-99-0080.

Dear Colonel Johnson:

The State of New York has completed its review of the above-mentioned document. It has been determined that the document adequately addresses those environmental issues of concern to the State and we support the Corps selection of Alternative B as the recommended plan.

Alternative B is a levee/floodwall plan designed with a selected 500-year level of protection. The plan will include the incorporation of environmental and recreational enhancement measures into the completed project. Alternative B will have a beneficial affect on the area in that it will reduce the damage that has resulted by recurrent floodings.

The State appreciates the opportunity for review and comment. We request the opportunity to review the final document when available. Comments to the document are included.

Very truly yours,

Louis M. Concra, Jr., Director
Division of Regulatory Affairs

LMC:ERM/ssf

cc: J. Corr, E. Wagner, D. Konsella, D. Blazer, T. Smith (DOT), file.

COMMENTS

Hydrology

The 100-year discharge rate used in the Final Feasibility Report (FFR) is considerably less than the 100-year discharge rate presented in the earlier Floodplain Information Report and the Flood Insurance Study. The hydrologists that prepared the FFR have carefully analyzed the watershed and believe they have derived the correct discharge figures. It is their opinion that hydraulic losses in the watershed were not accurately accounted for in previous studies. New York State does not disagree with the new values. Presently, the hydrological analysis is being reviewed at the Division level of the Corps of Engineers.

If the Division level supports the District analysis, we recommend that the Federal Emergency Management Agency be notified since the flood insurance mapping will require revising throughout the Irondequoit Creek Watershed. Revising the 100-year water surface profile downward reflecting the decrease in the 100-year discharge rate should result in substantial savings in flood insurance premium costs and may have an impact on future development.

Design

Concerns have been expressed regarding the incorporation of two old culvert structures presently used as pedestrian crossings only, into the project as hydraulic control structures. It has been determined, however, that the project will function as designed with or without these structures in place. During the interim period prior to their removal, the design discharge capacity of the project will not be affected in the event the culverts become blocked by debris.

Replacement of the old culvert structures at a later date with smaller pedestrian crossings will not impair project discharge capacity or its structural integrity as outlined by the Corps hydrologists.

The State recommends that the use of the levee for a hiking trail and as natural bleachers should be discouraged and that the Final EIS reflect concerns for the problems faced by the maintaining agency, the Town of Penfield.

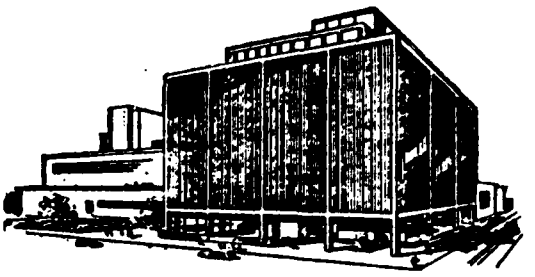
Maintenance

The State fully supports the following maintenance scheme to be required by the Corps of Engineers:

1. Irondequoit Creek, left in its natural state, will function as designed. However, debris that accumulates in its channel will have to be removed by the maintaining agency.
2. Shoaling at the confluence of Irondequoit Creek and Allen's Creek or anywhere in the project reach will have to be removed when it becomes a problem hydraulically or threatens a component of the flood control structures. The COE has agreed to consider working a threshold level into the Operation and Maintenance Manual that would trigger removal of shoals by the maintaining agency.
3. The improved channel along Allen's Creek must be maintained free of woody growth. We recommend that the banks be stabilized with goby-matts or similar material other than the standard type of rock rip-rap. It is also necessary that a clear area at least 15 feet wide be maintained along the top ob both banks for equipment access.
4. In the area of the proposed park, hydraulic design of the project anticipates that the park will be mowed. If the park should not be developed, it will be necessary for the maintaining agency to mow the area at least once a year to keep the brush from developing.

BENDERSON

DEVELOPMENT COMPANY, INC.



COMMERCIAL and INDUSTRIAL PROPERTIES • OFFICES • PLAZAS • APARTMENTS • MOTELS

570 Delaware Avenue
Buffalo, New York 14202
716 - 886-0211

May 7, 1981

Department of Army Corps of Engineers
1776 Niagara Street
Buffalo, New York

Re: Panorama Flood District
Penfield, New York

To Whom It May Concern:

This letter is being written in compliance with the ten day limitation requirement for the public to respond to the Corps of Engineers planned development in the area.

In as much as I haven't the appropriate names of the individuals I have addressed this accordingly.

1.) First of all I would like to express the position of Panorama Plaza as being anxious and in favor of any type of flood prevention for the safety of lives and property.

2.) We feel however, that the current contribution is inadequate and should be proportionately expanded.

3.) We would like to go on record as being opposed to the method being proposed for the distribution of the cost of maintenance of this berm.

Thank you for this opportunity to express our views on this matter.

Very truly yours,

BENDERSON DEVELOPMENT COMPANY, INC.

Jack Chesbro/m.m.
Jack Chesbro

JC/mkm

cc: Town of Penfield

Chuck Costich

AMONG OUR CLIENTS

A & P Tea Company
A. B. Dick Company
Addressograph-Multigraph Corp.
Alemite Division Stewart Warner Corp.
Allegheny Ludlum Steel Corporation
Allis-Chalmers
Allstate Insurance Company
America Fore Loyalty Group
American International Bowling Corp.
[illegible]n Mutual Liability Insurance
[illegible]an Stores Company
Armour - Dial
Bankers Life Insurance Co.
Bankers Trust
Bank of Buffalo
B. F. Goodrich Company
Birdair Structures Inc.
Brunswick-Balke-Collender
Buffalo & Erie County Planning Assn.
Buick Motor Division
Burger King
Burroughs Corporation
Capitol Records, Inc.
Carborundum Company
Carvel
Chase Manhattan Bank
Chevrolet Motor Division
Chicago Pneumatic Tool Company
Cincinnati Milling & Grinding Company
Citi-Bank
Comstock & Company
[illegible] Products Sales Company
[illegible]ery Package Mfg. Company
Cummins Diesel Engines, Inc.
Denny's Restaurant
Ditto Incorporated
Dover Elevator Co.
Dunn & Bradstreet, Inc.
Endicott-Johnson Company
Felsway Corporation
Fireman's Fund Insurance Company
First Investors Corporation
Fishman, M. H. & Company
Ford Motor Company
Friden, Inc
Fuller Brush Company
F. W. Dodge Corporation
General Electric Company
General Binding Sales Corp.
General Motors Holding Corp.
Glidden - Durkee Corp.
Goodyear Tire Company
Grand Union Company
Gulistan Carpets, Inc.
Holiday Inns of America
Huron Portland Cement Company
I. B. M.
Interstate United
Joanna Western Mills Co.
John Hancock Mutual Life Ins. Co.
K-Mart
Kemper Insurance

17 Parkview Drive
Rochester, New York 14625
May 6, 1981

Colonel George P. Johnson
District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

RE: Irondequoit Creek Watershed
Final Feasibility Report

Dear Colonel Johnson:

Pursuant to my oral comments at the April 29th public meeting at Penfield High School I wish to offer the following written remarks.

The selected plan calling for the construction of levees and floodwalls (Alternative B) is not in the best interests of the local governments and the State of New York because of the high cost of construction and the additional high cost of annual maintenance. The cash contribution required of the non-Federal interest at the time of construction and the subsequent requirement that the non-Federal interest assume the responsibility for maintenance would fall most heavily upon the Town of Penfield. The cost of maintenance alone would be in the range of $60,000 annually. As the former Supervisor and chief fiscal officer of the Town of Penfield, I must state flatly that the Town cannot and should not assume such a burdensome annual obligation. Supervisor Bundschuh's suggestion that a special district be created to bear the annual costs would legally require an affirmative vote and is not likely to succeed for the reason that the charges apportioned to the so-called "benefited" properties would be rejected as being exorbitantly expensive.

To make matters worse, as you revealed at the meeting, final costs have not too surprisingly increased already by $900,000. It can be expected that by the time the project were to be authorized and construction begin, costs would have again increased greatly thus bringing the benefit-cost ratio down below the present 1.7 ratio.

As I expressed at the meeting, I have deep concern that this project and the current Urban Runoff study (both Federally funded) which is designed to prevent the pollution of Irondequoit Creek are at cross purposes. A large structural project such as the one proposed, which would cause a loss of water quality due to sedimentation and turbidity, would be counter-productive to the goals of the Runoff study. It is my suspicion that coordination between the two studies has been less than satisfactory.

The Feasibility Report (Appendix B 9 and 12) states incorrectly that there will be no future development of the Panorama Plaza flood plain. Although such is to be fervently desired, there has been, in fact, an application before the Town for four (4) additions to the Plaza. The correction should be so noted.

There can be no question that protection for the Panorama Plaza area is needed. The question is how will that protection be provided. Surely the no-action alternative which relies on flood warning, floodproofing, evacuation, flood insurance and flood plain regulation is not acceptable - particularly in a town where regulation is not stringently enforced.

Since the Panorama flood plain lies at the foot of the watershed with flood water originating upstream through Thomas Creek, Allen's Creek and Irondequoit Creek, it would seem more logical and less expensive to allow flood waters to overflow onto adjacent open land in the same manner as the annual flood overflow in Ellison Park. Land for the purpose could be purchased in the upper reaches of the watershed at much less cost than land required in the Panorama area for a flood project.

It is argued that waters are now almost fully absorbed in the available land areas upstream and that there would therefore be insufficient retention capability. I offer the counter-argument that waters could be diverted over a larger acreage than presently floods by very simple devices. It makes much more sense to curtail flow and velocity before it causes damage than to contain waters by massive, disruptive structures later. In so doing, it would be possible to retain vehicular usage of the Old Penfield Road bridge which is planned for pedestrian use only in the Corps plan. Closure of the bridge would be a hardship to residents and businesses in the area as well as a practical problem for the Town during the snow plowing season. Diminution of flow upstream would also allow proper access to the Genesee Conservation League which is allowed only a single lane road atop a levee under the Corps plan.

I would also point out that acquistion of overflow areas upstream could add a recreational component to a flood prevention plan. The resulting recreational advantages may well add to an acceptable benefit-cost ratio.

The April 29 meeting in Penfield produced no speaker who endorsed the proposed plan. In fact, many expressed concern. My considered opinion is that everyone recognizes the necessity of protection but have serious doubts about the selected plan as well as its financial impact.

It is possible that the Penfield Town Board and Monroe County might short-sightedly ~~might~~ request the State of New York to refuse being the local sponsor. Should that happen, and there is no alternative plan, the Corps will drop the project completely. The result will be $375,000 spent on the latest study, and, to make matters worse, no protection for the businesses and residents who have suffered considerable loss in past floods. Protection is needed. The Corps should find a more acceptable way to provide it.

My appeal is to request a more creative approach utilizing upstream retention. The Corps can and should dismiss conventional flood control methods and be willing to explore new directions in solving the Irondequoit Creek flood problem.

Very tuly yours,

Irene L. Gossin

D. MACPHERSON
PLANNING

Corps of Engineers

PENFIELD
Post-Republican
Pittsford, N.Y.
21 May 81

Buffalo District

Letter to the Editor:

Gossin Comments on Creek Feasibility Study

U12

To the Editor:

Pursuant to my oral comments at the April 29th public meeting at Penfield High School I wish to offer the following written remarks.

The selected plan calling for the construction of levees and floodwalls (Alternative B) is not in the best interests of the local governments and the State of New York because of the high cost of construction and the additional high cost of annual maintenance. The cash contribution required of the non-Federal interest at the time of construction and the subsequent requirement that the non-Federal interest assume the responsibility for maintenance would fall most heavily upon the Town of Penfield. The cost of maintenance alone would be in the range of $60,000 annually. As the former Supervisor and chief fiscal officer of the Town of Penfield, I must state flatly that the Town cannot and should not assume such a burdensome annual obligation. Supervisor Bundschuh's suggestion that a special district be created to bear the annual costs would legally require an affirmative vote and is not likely to succeed for the reason that the charges apportiond to the so-called "benefited" properties would be rejected as being exorbitantly expensive.

To make matters worse, as you revealed at the meeting, final costs have not too surprisingly increased already by $900,000. It can be expected that by the time the project were to be authorized and construction begin, costs would have again increased greatly thus bringing the benefit-cost ratio down below the present 1.7 ratio.

As I expressed at the meeting, I have deep concern that this project and the current Urban Runoff study (both Federally funded) which is designed to prevent the pollution of Irondequoit Creek are at cross purposes. A large structural project such as the one proposed, which would cause a loss of water quality due to sedimentation and turbidity, would be counter-productive to the goals of the Runoff study. It is my suspicion that coordination between the two studies has been less than satisfactory.

The Feasibility Report (Appendix B 9 and 12) states incorrrectly that there will be no future development of the Panorama Plaza flood plain. Although such is to be fervently desired, there has been, in fact, an application before the Town for four (4) additions to the Plaza. The corrections should be so noted.

There can be no question that protection for the Panorama Plaza area is needed. The question is how will that protection be provided. Surely the no-action alternative which relies on flood warning, floodproofing, evacuation, flood insurance and flood plain regulation is not acceptable - particularly in a town where regulation is not stringently enforced.

Since the Panorama flood plain lies at the foot of the watershed with flood water originating upstream through Thomas Creek, Allen's Creek and Irondequoit Creek, it would seem more logical and less expensive to allow flood waters to overflow onto adjacent open land in the same manner as the annual flood overflow in Ellison Park. Land for the purpose could be purchased in the upper reaches of the watershed at much less cost than land required in the Panorama area for a flood project.

It is argued that waters are now almost fully absorbed in the available land areas upstream and that there

D. MacPherson

would therefore be insufficient retention capability. I offer the counter-argument that waters could be diverted over a larger acreage than presently floods by very simple devices. It makes much more sense to curtail flow and velocity before it causes damage than to contain waters by massive, disruptive structures later. In so doing, it would be possible to retain vehicular usage of the Old Penfield Road bridge which is planned for pedestrian use only in the Corps plan. Closure of the bridge would be a hardship to residents and businesses in the area as well as a practical problem for the Town during the snowplowing season. Diminuation of flow upstream would also allow proper access to the Genesee Conservation League which is allowed only a single lane road atop a levee under the Corps' plan.

I would also point out that acquisition of overflow areas upstream could add a recreational component to a flood prevention plan. The resulting recreational advantages may well add to an acceptable benefit-cost ratio.

The April 29 meeting in Penfield produced no speaker who endorsed the proposed plan. In fact, many expressed concern. My considered opinion is that everyone recognizes the necessity of protection but have serious doubts about the selected plan as well as its financial impact.

It is possible that the Penfield Town Board and Monroe County might short-sightedly request the State of New York to refuse being the local sponsor. Should that happen, and there is no alternative plan, the Corps will drop the project completely. The result will be $375,000 spent on the latest study, and, to make matters worse, no protection for the businesses and residents who have suffered considerable loss in past floods. Protection is needed. The Corps should find a more acceptable way to provide it.

My appeal is to request a more creative approach utilizing upstream retention. The Corps can and should dismiss conventional flood control methods and be willing to explore new directions in solving the Irondequoit Creek flood problem.

Irene L. Gossin

United States Department of the Interior

OFFICE OF THE SECRETARY

Northeast Region
15 State Street
Boston, Massachusetts 02109

ER-81/228

May 1, 1981

Colonel George P. Johnson
Buffalo District, Corps of Engineers
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

The Department of the Interior has reviewed the January 1981 draft environmental statement and feasibility report (combined) for the Irondequoit Creek Watershed, Monroe and Ontario Counties, New York, and offers the following comments for your consideration.

General Comments

The draft environmental statement and feasibility report adequately addresses most existing resources and describes general project construction impacts. The report also addresses the requirements of other necessary actions having to be in compliance with associated Federal laws and policies.

The concerns expressed in the September 13, 1979, comments from the Fish and Wildlife Service on the preliminary feasibility report have been addressed to our satisfaction. Also, the mitigative measures recommended in the December 16, 1980, Final Fish and Wildlife Coordination Act Report have been adopted into the project plans.

Specific Comments

Page EIS-44, paragraph 4.36 - The nature and extend of impacts upon the quarry operations at Quarry Lake should be identified.

The report would benefit from the insertion of a paragraph into Section 4 of the environmental statement regarding mineral impacts. This paragraph should relate to mineral commodities and the in-the-ground mineral resources committed to the project, to those mineral resources mentioned on page 20 of the feasibility report.

Summary Comments

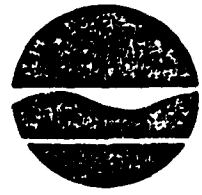
The Department of the Interior concurs with the recommended plan.

Sincerely,

William Patterson

William Patterson
Regional Environmental Officer

New York State Department of Environmental Conservation
6274 E. Avon-Lima Rd., Avon, NY 14414
716-226-2466



Robert F. Flacke
Commissioner

Eric A. Seiffer
Regional Director

May 1, 1981

Mr. Tod D. Smith
U.S. Army Engineer District
1776 Niagara Street
Buffalo, NY 14207

Re: DEC 828-99-0080
Final Feasibility Report and
Environmental Impact Statement

Dear Mr. Smith:

The Department of Environmental Conservation has not completed its review of the Environmental Impact Statement (EIS) and Final Feasibility Report for the above-noted project. It is requested that we be granted an extension of review time until May 15, 1981. You will receive the Department's response on or prior to that date.

We appreciate your attention to this matter.

Very truly yours,

Robert K. Scott
Sr. Environmental Analyst
Regulatory Affairs

RKS:mm

cc: Murdock Mackenzie
Attn: Ed Miller
Frank Keller

D. MacPherson
Planning

Corps of Engineers

Penfield
Post-Republican
Pittsford, N.Y.
30 April 1981

Buffalo District

Public Meeting to Discuss Panorama Antiflood Plan

A public meeting and public hearing were held Wednesday, April 29, at Penfield High School to discuss the proposed plan for flood prevention in the Irondequoit Creek watershed near Panorama Plaza.

The plan, being proposed by the Buffalo District Corps of Engineers, calls for alteration in the creekbed around the confluence of Irondequoit Creek and Allen Creek, one of its major tributaries.

The bank of the creek will be reshaped, and the creekbed and bank will be lined with riprap and bedding material. Riprap is filled material which will slow the velocity of the creek waters.

A three-foot high drop structure, constructed out of sheet piling, will be placed in Allen Creek 850 feet upstream of the confluence to dissipate energy and reduce creek velocity. In addition, levees and floodwalls will be constructed along the creek as further protection.

The cost of the project is estimated at $3,790,000. Federal sources will cover $3,170,000 of the costs. There is dispute over where the nonfederal funds will come from. In addtion, there will also be a cost of $60,000 per year for maintenance. It has not yet determined who will pick up the maintenance cost, either.

The average net benefit to the area is estimated at $331,200 per year. This estimate includes the possibility of future building when the area is considered safe.

The Monroe County reaction to the proposed project has been mixed. The county manager, Lucien Morin, said that the plan was not well coordinated with a federally funded water quality study which is under way in the Irondequoit Creek watershed.

The water quality study recommendations include a reservoir option. Reservoirs were considered by the Corps of Engineers, but rejected because none of the sites considered were large enough to be effective by themselves. But, according to a response by the county, the reservoirs, combined with the flood protection plan, could have multiple benefits.

Other problems brought up included a need for definition of where the nonfederal funds would come from, and whether or not the benefits were worth the expense.

D. MacPherson

rec'd 5/12/81

IRONDEQUOIT CREEK WATERSHED STUDY
29 APRIL 1981 PUBLIC MEETING

Comment Sheet

The purpose of this comment sheet is to offer you an opportunity to comment candidly on the proposed alternatives to provide flood damage reduction measures for the Irondequoit Creek Watershed. Please state if the statement is your opinion or if it represents the position of your community/organization. The Corps, Buffalo District, will use this information to document concerns that will be addressed during the revision of the final feasibility report and environmental impact statement.

This appears to be a good study, and I agree that the selected plan is the best solution. The Corps seems to be well-informed.

I hope that this type of development (under an individual market system) leaving the results of the development and flood plains as potential flood plain for the taxpayer to remedy) may be prevented in the future.

Name/Title Harvey F. Schneibel Member Transportation Bd.

From: Town/Organization/Individual Town of Webster NY

Address 113 Woodland Lane

Webster NY 14580

Zip Code

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10007

APR 29 1981

Colonel George P. Johnson
District Engineer
Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

LO-1

Dear Colonel Johnson:

We have reviewed the Draft Environmental Impact Statement (EIS) and the Draft Final Feasibility Report for the proposed flood protection plan for the Panorama Plaza Area of the Irondequoit Creek Watershed, Monroe County, New York. As described in these documents, the preferred alternative (Alternative B), the levee/floodwall option, would involve construction of several thousand feet of levees and floodwalls along Irondequoit and Allen Creeks (a tributary of Irondequoit Creek), and would also require channelization of 900 feet of Allen Creek. The following comments regarding the project and its conformance with the Section 404(b)(1) guidelines of the Clean Water Act are offered for your consideration.

There are no wetlands in the immediate project area. However, aquatic habitat will be adversely impacted by the placement of rip-rap and fill in Allen Creek, and wetlands located downstream of the project area in Irondequoit Creek may be affected by increased sediment loadings during project construction. The Section 404 evaluation included in the EIS indicates that erosion and sediment control techniques will be required during project construction, and that various fish and wildlife protection measures recommended by the U.S. Fish and Wildlife Service will be incorporated into the final project design. Based upon this, the U.S. Environmental Protection Agency concurs with your determination that the project is environmentally acceptable, and we have no objections to its finalization.

In accordance with EPA policy, we have rated this EIS as LO-1, indicating our lack of objections to the project (LO) and the sufficiency of information (1).

Thank you for the opportunity to comment.

Sincerely yours,

Charles M. Denicola for

Anne Norton Miller, Director
Office of Federal Activities

D. MacPherson
Planning

Corps of Engineers

PENFIELD 92
POST-REPUBLICAN
Pittsford, N.Y.
APR- 23 81

Buffalo District

Our Town

By Anna Bundschuh

Last week I wrote about the water quality study of the Irondequoit watershed, and the public information meeting to be held Monday, April 27. In Our Town this week, I want to describe the flood prevention study of the Corps of Engineers in the Panorama Plaza area, but because it is confusing to distinguish between the various Irondequoit Bay and Creek studies, let me first enumerate them.

First, there's the Irondequoit Bay opening project of the Corps of Engineers. The Corps is currently recommending either a 24' lift bridge or the severing of the automobile bridge at the opening of the bay. County Manager Lucien Morin has said recently that the county will not pay the local share of this project until the towns surrounding the bay redo their zoning to provide appropriate land use controls in the bay area. Penfield is the only town so far to have adopted a new zoning ordinance.

The second activity under way is the Irondequoit Bay Plan implementation committee. The purpose of this committee, made up of officials and citizens from the four towns surrounding the bay, as well as county and state officals, is to see that the Irondequoit Bay Plan, which is a land use plan, is put into effect through town zoning changes. Another issue to be considered is water use zoning in the bay itself.

A third study is the water quality study in the Irondequoit watershed to determine the source of the present pollutants of the creek and bay and to recommend management practices to reduce these pollutants.

And the fourth study is the Corps of Engineers Irondequoit Creek Watershed flood damage reduction project. A public hearing is scheduled for Wednesday, April 29, 1981 at 7:30 p.m. at the Penfield High School to review the corps' studies and to hear public comments upon proposed levees, floodwalls, and channelization along Irondequoit and Allens Creek in the Panorama Plaza area. Excavation of bank and bottom material is involved in the proposal, as is the use of stone riprap and bedding material.

The project cost in today's dollars is estimated to be $3,790,000. The corps calculates the annual benefit of the project to be $676,620 versus an annual cost of $345,400, or a benefit/cost ratio of 1.96.

Of particular interest and concern to Town of Penfield officals is the operation and maintenance costs which are seen to be town charges. This would amount to nearly $60,000 annually for maintenance of the levees, floodwalls, banks, and channels. Sixty thousand dollars amounts to a 20 per cent increase over current town expenditures. It has been suggested that a special benefitted area of properties within the flood plain that would benefit directly from the reduction of flood damage, might be set up. Property owners in the Panorama area should consider whether proposed annualized benefits of over $600,000, are worth the local expenditure of $60,000 for flood project maintenance.

Members of the town board will be attending the hearing to learn more about the proposed project, and to listen to citizens' comments.

A 100 year or 500 year flood would cause a disastrous situation in the Panorama area. The corps' proposal is aimed at lessening both property damage and potential loss of life.

Anna R. Bundschuh,
Supervisor

D. MacPherson
Planning

New York State Department of Environmental Conservation
6274 E. Avon-Lima Rd., Avon, NY 14414
716-226-2466

Robert F. Flacke
Commissioner
Eric A. Seiffer
Regional Director

April 17, 1981

Colonel George P. Johnson
District Engineer
U. S. Corps of Engineers
Buffalo District Office
1776 Niagara Street
Buffalo, NY 14207

Re: DEC 828-99-0080
C of E/Irondequoit Creek
Monroe County

Dear Colonel Johnson:

On April 15, 1981, members of my staff and Richard Konsella, from our Bureau of Flood Protection in Albany, met with Dave McPherson and Todd Smith, members of your staff.

The purpose of this meeting was to clarify some technical points so our Department could provide you with meaningful review comments for your Final Feasibility Report and Environmental Impact Statement on the Irondequoit Creek Watershed Study.

A key issue, that arose during the discussion, was the roughness factor for overland flow used for routing flows through the damage reach (Panorama Plaza area). You are aware that timely maintenance is required to assure that the protection works will function properly. The level of vegetal growth control in an overland flood area is crucial.

It is not clearly understood how the bridges, which are to be retained, will respond under flood flows and particularly if clogged with debris. The overland roughness factor may play a role in this response.

As a side issue, it is suggested that the levee may serve as a bike path as well as natural bleachers for sports activities.

The traffic encouraged by using the levees for recreation activities make it impossible to maintain suitable grass cover. A well-maintained grass cover is a necessary feature for levees to function properly. Our State would discourage this type of multiple use because the integrity of the levees may be threatened. Well-designed points of crossing are, of course, permissible.

We don't believe that Mr. Brady, of your staff, was consulted about this study. In addition to the environmental issues, the maintenance of the structural works is equally, and perhaps even more, important. Mr. Brady's consultation would have perhaps negated some of our obvious concerns.

Mr. McPherson did a commendable job in presenting a summary of the proposal. Another meeting, perhaps on the 29th of April, would help us. We hope that a way can be found to reduce the economic losses to the Monroe County communities.

We appreciate your assistance with this important program.

Sincerely,

Eric A. Seiffer

Eric A. Seiffer

FK:mm

cc: Murdock MacKenzie w/attachment
Elmer Wagner
Frank Keller
Jim Kelly
Allan Buddle

MONROE COUNTY
ENVIRONMENTAL
MANAGEMENT
COUNCIL

JAMES K. NOLEN, Chairman
ANN B. NELSON, Program Coordinator
STEPHEN MURPHY, Environmental Engineer
CHARLES R. O'NEILL, JR., Procedures Analyst

Executive Office Building, 10 North Fitzhugh Street, Rochester, New York 14614/Phone: (716) 428-5745

April 1, 1981

David R. MacPherson
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Mr. MacPherson:

The Monroe County Environmental Management Council has reviewed the draft final feasibility report and draft environmental impact statement for flood control in the Irondequoit Creek watershed.

In general, we believe this is a valuable document. All of the significant flood problem areas have been identified, a variety of management alternatives have been considered, and the proposed measures are fairly well supported by the information and the analysis. We are particularly impressed by the thoughtful design of the proposed levee/floodwall project in the Panorama Plaza area. The Corps obviously made a strong effort to preserve the character of Irondequoit Creek and to minimize the adverse effects of changes to Allen Creek.

However, the report could be improved. There was a great deal of extraneous information and far too much redundancy which made the report much more difficult to read. There were also many errors in the extraneous information. We realize that the Corps is trying to be comprehensive, but presenting information this way causes confusion and the errors leave the entire report open to suspicion. We strongly recommend that you try to present a simple statement limited to relevant information. It may also be worthwhile to bind the appendices separately.

The watershed boundaries need to be corrected. White Brook passes through a culvert under the Barge Canal and joins Thomas Creek, so the area it drains should be included in the watershed. There are also several streams that originate in the Town of Pittsford, pass through the Village of Pittsford, and empty into the Barge Canal (Streams numbered 0-108-P-113-3-13, -3-13-2, -3-13-2a, and -3-13-3). The area drained by these streams should be removed from the watershed (Either the Ithaca office of United States Geological Survey or we can supply the correct boundaries.). Of course, these changes will require revision of the flood discharge analyses.

Additional information about the alternative of reservoir construction would also be worthwhile. The comparison of available storage to required storage for various rainfalls was not particularly helpful. The following would be more useful:

1. Would any combination of reservoirs significantly reduce flood discharges in the Panorama Plaza area or other problem areas? If so, approximately how much reduction would occur?

2. Approximately how much of a difference would that make in the estimated costs of the proposed project and how much benefit would other areas receive?

3. What would be the approximate costs to construct the reservoirs?

With this information, one could determine the cost that would have to be attributed to purposes other than flood control for a multipurpose reservoir.

Thank you for the opportunity to comment.

Sincerely yours,

James K. Nolen
Chairman

jnb

County of Monroe
Office of County Manager
110 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

LUCIEN A. MORIN
COUNTY MANAGER
DIRECTOR OF FINANCE

March 31, 1981

Colonel George P. Johnson
District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

Subject: Review of Irondequoit Creek Watershed Final Feasibility Report and Environmental Impact Statement

Thank you for the opportunity to review the above-mentioned report. It has been reviewed by several county agencies and their comments are presented in the attached statement which I am requesting be included in the public record.

The report recommends a course of action for minimizing the frequency and severity of flooding in the Irondequoit Creek Watershed. This includes constructing a series of levees and floodwalls near Panorama Plaza in the town of Penfield and carrying out several non-structural flood control measures in the remainder of the watershed. In general, Monroe County supports the recommendations in the report. The draft environmental impact statement recognizes, for the most part, the extent of impacts associated with the recommended plan and identifies appropriate mitigation measures. We do, however, feel that the Corps of Engineers' study should be better coordinated with the major federally funded water quality study which is underway in the Irondequoit Creek Watershed. This study, funded under the Nationwide Urban Runoff Program, will investigate several measures to control surface runoff pollution, including constructing a series of small-scale reservoirs in the Irondequoit Creek Watershed. The Corps of Engineers study should give greater consideration to water quality improvements being investigated in the NURP study, such as the reservoirs, which could improve water quality and provide recreational as well as flood control benefits.

Also, implementing the flood control improvements recommended in the report depends in part on non-federal participation. It is important that the report propose specific responsibilities and contributions of each level of government participating in the project, especially those related to the constructing and maintenance of the structural improvement near Panorama Plaza.

These comments and others are discussed in greater detail in the attachment. Once again, thank you for the opportunity to review the Irondequoit Creek Watershed Flood Control Study, and if you have any questions on these comments,

please contact Don B. Martin, County Director of Planning at (716) 428-5475.

Sincerely,

Lucien A. Morin
County Manager

LAM/cm
Attachment

xc: Don B. Martin, Director, Monroe County Department of Planning
Dr. Joel Nitzkin, Director, County Health Department
Gerald McDonald, Director, County Department of Engineering
John Davis, Acting Director, County Department of Wastewater Management
Anna Bundschuh, Supervisor, Town of Penfield
Robert Jonas, Chairman, Irondequoit Basin Water Quality Advisory Committee
Eric Seiffer, Director, New York State Department of Environmental Conservation - Region 8, Avon
Gerald Rider, NURP Project Director, New York State Department of Environmental Conservation, Albany
Allan Buddle, New York State Department of Environmental Conservation Flood Control Office, Elmira
William Kappel, U. S. Geological Survey, Ithaca

COMMENTS BY MONROE COUNTY ON THE BUFFALO DISTRICT, CORPS OF ENGINEERS
IRONDEQUOIT CREEK WATERSHED
FINAL FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT

1. We feel that this project does not fully consider a major federally funded water quality study which is being conducted in the Irondequoit Creek Watershed. The County of Monroe and the State of New York Department of Environmental Conservation (DEC) are involved in one of 30 Nationwide Urban Runoff Program (NURP) studies being conducted across the country to determine the significance of and ways to control pollution from urban runoff. The NURP study is funded by the U.S. Environmental Protection Agency (EPA). The coordination and integration of the NURP study and the flood control study must be given greater attention in the Corps of Engineers report so that limited federal resources can more efficiently be used to achieve multiple benefits for the entire Irondequoit Creek watershed. One of the pollution control measures which will be evaluated as part of the NURP study is the construction of small-scale reservoirs in the Irondequoit Creek Watershed. These reservoirs could have multiple benefits by improving water quality as well as serving as flood control structures. While the Corps of Engineers report does consider a series of upstream reservoirs for flood control, its benefit/cost analysis does not consider the water quality and recreational benefits associated with such structures. Therefore in order to obtain an accurate picture of all potential benefits, we recommend that the final Corps of Engineers report include a broader evaluation of the reservoir option. To help in this evaluation, data on the following would be useful:

   a. Would any combination of reservoirs significantly reduce flood discharges in the Panorama Plaza area or other problem areas? If so, approximately how much reduction would occur?

   b. Approximately how much difference would that make in the estimated costs of the proposed project?

   c. What would be the approximate costs to construct the reservoirs?

   With this information, it would be easier to determine whether or not multi-purpose reservoirs could be justified. To obtain more information on the water quality benefits of multi-purpose reservoirs or on the NURP study in general, please contact Mr. Jerry Rider, New York State Department of Environmental Conservation, 50 Wolf Road, Albany, New York 12233, or Mr. Robert Gallucci, NURP Project Manager, Monroe County Department of Engineering, Rochester, New York 14614.

2. The report is unclear as to the division of responsibilities for implementing the recommended plan. The role and responsibilities of the State Department of Environmental Conservation (DEC), Monroe County and the towns in the watershed should be determined as soon as possible. This is especially important with regard to the non-federal costs and on-going maintenance responsibilities associated with the structural improvements at Panorama Plaza in the town of Penfield. Since the benefits of the proposed Panorama Plaza structural improvement are local in scale and will not have an inter-municipal impact, it would not be appropriate that Monroe County bear the

costs and responsibilities associated with this improvement. In any event, the non-federal costs and responsibilities of implementing the entire recommended plan should be determined before the report is finalized. Monroe County is willing to participate in any meeting aimed at determining these responsibilities.

3. If a recreation trail is planned as part of the proposed park behind Panorama Plaza, it should take into account scenic and public safety considerations. A trail on top of a levee that slopes off into concrete culverts has the potential of being unsafe, especially if children will be biking on it. A preferable alternative might be locating the trail along the banks of the creek. This would be safer and more scenic. Monroe County will be glad to work with the Corps of Engineers and the Town of Penfield in reviewing the park design as it relates to the proposed levees/floodwalls as part of detailed project planning.

4. The watershed boundary should be revised. The following changes should be made: White Brook, which drains into Thomas Creek, should be included in the watershed; and an area south of the Barge Canal in the village and town of Pittsford should be excluded from the watershed since it drains into the Barge Canal. These changes should have no appreciable effect on the conclusions of the report. For more information, please contact William Kappel, U.S.G.S. - Ithaca at (607) 272-8722.

5. Two county facilities - a sanitary interceptor sewer and a related chemical feed building - would be located within the levees/floodwalls proposed near Panorama Plaza. The draft Environmental Impact Statement should discuss impacts to these facilities in its analysis of damage to public utilities from the proposed structural improvement. The sanitary sewer could be affected by flood waters entering manhole covers. Also, safe vehicular access must be maintained to any manholes which fall within the proposed levee/floodwalls. The Pure Waters chemical feed building stores sodium nitrate in dry bag form and liquid sodium hypochlorite in a 3000 gallon below grade tank. This building normally operates during the dry weather periods only. However, flood waters could potentially damage pumps, motor mixing equipment and electrical switch gears. Also the stored sodium nitrate, if damaged, could pollute Irondequoit Creek. Therefore, the Corps of Engineers report should consider options and costs to protect or relocate the chemical feed building. If the building is not relocated, safe and easy access must be maintained. For more information on the county sewer facilities, please contact John Davis of the County Department of Wastewater Management at 428-5577.

United States Department of Agriculture
Soil Conservation Service
U. S. Courthouse and Federal Building
100 South Clinton Street, Room 771
Syracuse, New York 13260

March 19, 1981

Colonel George P. Johnson
District Engineer
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

We have reviewed the Draft Feasibility Report and Draft Environmental Impact Statement for the Irondequoit Creek Watershed, New York, dated January 1981, prepared by the Buffalo District, Corps of Engineers. Copies of this data were received directly from your office and through the Washington Office of USDA.

The following are our comments:

(1) The statement on page 27 of the Feasibility Report is not completely accurate stating, "Erosion problems are few and localized....." The localities listed appear to relate principally to streambank erosion. There is a significant amount of sheet erosion in the cropland area of the watershed. Another source of sediment is that resulting from earth disturbing activities related to construction and development.

The enclosed Erosion and Sediment Inventory (1974) is an inventory of erosion taking place in New York watersheds at the time of the report. Data is summarized in the report for the Irondequoit Creek Watershed. At the time the report was prepared, some 7,499 acres of cropland showed erosion rates averaging 8.41 tons/acre/year. Normally, on cropped soils in this watershed, erosion rates exceeding three tons per acre per year are considered excessive.

(2) Page EIS-46, paragraph 5.03

The statement is made that "Implementation of a watershed management program, therefore, remains as a local responsibility in the Irondequoit Creek Watershed." You may be aware that the Monroe County Soil and Water Conservation District has an ongoing program implementing proper soil conservation practices for all of Monroe County. The same holds true for the Wayne and Ontario Soil and Water Conservation Districts in their respective counties. It would seem logical that these districts be asked to provide a lead role in implementing a watershed management program in the watershed at an accelerated rate.

(3) We note that an assessment of the project impact on prime and unique farmlands has been made and no adverse impact on these lands is forecasted. Included with this memo is a recently released map of Monroe County which shows the locations of prime and unique and important farmlands in the county. This may assist the Buffalo District in its program.

We appreciate the opportunity to review and comment on this statement.

Sincerely,

Paul A. Dodd
State Conservationist

Enclosures
cc: Norman A. Berg, Chief, SCS, Washington, D.C.
Office of Federal Activities (OFA), EPA, New York, New York
Arthur B. Holland, Acting Director, NETSC, SCS, Broomall, Pa.
Warren L. Wittmann, AC, SCS, Batavia, New York
Jamon K. Baker, DC, SCS, Rochester, New York
John J. Rappa, DC, SCS, Canandaigua, New York
Frank J. Winkler, DC, SCS, Sodus, New York

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
AREA OFFICE
107 DELAWARE AVE., STATLER BLDG., MEZZANINE
BUFFALO, NEW YORK 14202

REGION II
26 Federal Plaza
New York, New York 10007

March 20, 1981

IN REPLY REFER TO:
2.1S

George P. Johnson, Colonel
District Engineer
D.O.A. - Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Sir:

Subject: Draft EIS
Irondequoit Creek Watershed
Monroe, Ontario and Wayne Counties, New York

This letter is to advise you that we have reviewed subject Draft Environmental Impact Statement. We have not identified any specific deficiencies or conflicts with HUD Programs at this time.

In addition to containing extensive technical information on the watershed, the section on alternative nonstructural solutions is enlightening from an educational perspective for other agencies and the public.

We will be pleased to review the Final Environmental Impact Statement when it is published.

Sincerely,

James F. Anderson
Area Manager

cc: Krotenberg, Marvin
Morgan, Russell

Corps of Engineers

BRIGHTON-
PITTSFORD POST
Pittsford, N.Y.
MAR 12 81

Buffalo District

D. MACPHERSON
PLANNING

Allens Creek Residents Debate Canal Water Flow

4 1 F

By Jim Gertner

Residents along Allens Creek want a continuous flow of water during the hot Summer months. The Monroe County Department of Health says to do this, polluted water must be siphoned from the Barge Canal. After a meeting of both sides Tuesday, a tentative compromise was worked out.

More than 20 persons attended a meeting with Richard Burton, associate chemist with the department of health, to hear reasons for the shutdown of siphonage and to present views for continued water flow.

Burton quoted data generated by the department pointing to the fact that the quality of water siphoned from the Barge Canal was substantially poorer than the quality of the base flow water in the steam. He also said the discharges from the canal attributed nearly 50 per cent of the nutrient loading to the creek and to Irondequoit Bay.

Many of the residents complained of the dry conditions created last Summer by the discontinued siphonage. They cited a decrease in wildlife, insect infestation, and odor as problems experienced last year.

Burton described a pure waters program which spent $150 million to remove the pollutants from the bay that the canal is putting right back in with the siphons active. The department is also conducting a study to determine the effects of urban runoff and other pollutants on the stream.

Burton said he believes urban runoff contributes in excess of 50 per cent of the pollutants. He mentioned past problems with the development of the Jefferson Rd. area and the truck stops.

The canal has had three siphons in effect since 1968. They were operational at all times from April to October, to augment water flow to the creek. It was also done to dilute sewage effluent from the Town of Brighton Allens Creek Sewage Treatment Facility below Corbetts Glen. Discontinuation of the operation of that plant eliminated the requirement for flow maintenance.

Burton said it was understood that if any serious problem resulted because of returning the streams to natural flow, consideration would be given to some flow augmentation. He said the department, and he personally, had heard no serious complaints.

Brighton Town Board member Jeanne Hutchins, attending the meeting, said she had received many complaints last Summer and had directed them to the public works department. Commissioner Robert Evans said there were several occasions last Summer where the water quality in the creek was questionable, and siphons were turned on.

Both Burton and Evans agreed to open the small siphon around mid-June and to keep a steady flow of 10 cubic feet per second of water from the canal. They also said if natural flow is adequate the siphon would be turned off. Most of the residents responded favorably to the proposal.

"We try to keep an eye on the water flow at all times," Evans said "We are very responsive to the problems of the residents, and try to provide them with a good quality water. I don't want to affect the people (living on the creek) or the county's study (urban runoff.)"

Burton asked that people let him know when problems arise. He said he would be more than happy to come and investigate any complaints.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

IN REPLY REFER TO:

March 4, 1981

Mr. George P. Johnson
Colonel, Corps of Engineers
District Engineer
U. S. Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Johnson:

I am replying to your request of January 30, 1980 to the Federal Energy Regulatory Commission for comments on the Final Feasibility Report and Environmental Impact Statement on the Irondequoit Creek Watershed. This Feasibility Report and EIS has been reviewed by appropriate FERC staff components upon whose evaluation this response is based.

This staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power, natural gas, and oil pipeline industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Thank you for the opportunity to review this statement.

Sincerely,

Jack M. Heinemann
Advisor on Environmental Quality

STATE OF NEW YORK
PARKS AND RECREATION
ALBANY

ORIN LEHMAN
COMMISSIONER

February 23, 1981

Dear Colonel Johnson:

Review of the Irondequoit Creek Watershed Final Feasibility Report and Environmental Impact Statement by my staff produced only favorable comments regarding its thoroughness.

Noted particularly was the coordination with the Penfield Town Park plans and possibility of a hiking trail on the top of the levee.

Thank you for the review opportunity.

Sincerely,

Colonel George Johnson
District Engineer
U.S. Department of the Army
Corps of Engineers
1776 Niagara Street
Buffalo, NY

STATE OF NEW YORK
EXECUTIVE CHAMBER
ALBANY 12224

ROBERT J. MORGADO
SECRETARY TO THE GOVERNOR

February 18, 1981

Dear Colonel Johnson:

On behalf of Governor Carey, I acknowledge a copy of the Draft Final Feasibility Report and Draft Environmental Impact Statement and associated Appendices, entitled "Irondequoit Creek Watershed, New York" transmitted with your letter of January 30.

Sincerely,

Colonel George P. Johnson
District Engineer
District Corps of Engineers
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
THE ADMINISTRATOR

11 FEB 1981

Dear Col. Johnson:

I am writing to verify the official filing of your EIS entitled:

Draft: Irondequoit Creek Watershed Flood Protection for the Plaza Area, Monroe County, New York (#810101)

This EIS was received by the Office of Environmental Review on February 2, 1981. It has been determined the above document meets the requirements for filing an EIS as set forth under Section 1506.9 of the CEQ Regulations. Accordingly, EPA has scheduled publication of the Notice of Availability in the Federal Register dated February 13, 1981 and the public review period is scheduled to terminate on *April 30, 1981 .

If you have any questions or concerns relating to this matter, please do not hesitate to contact me or Ms. Jan Lott of my staff on 245-3006.

Sincerely,

Kathi L. Wilson

Kathi L. Wilson
Management Analyst
Office of Environmental Review (A-104)

Col. George P. Johnson
District Engineer
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

* as indicated in the DEIS, EPA publishes April 30, 1981 as the end of the review period.

AGENDA FOR A MEETING
REGARDING THE IRONDEQUOIT BASIN WETLANDS
AND THE CONSTRUCTION OF A WATER ELEVATION CONTROL STRUCTURE
IN THE AREA REFERRED TO AS THE NARROWS

DATE: August 27, 1980
TIME: 10:00 A.M.
PLACE: 9th Floor Conference Room, 111 Westfall Road

The purpose of this meeting is to gather together in one place all those individuals that would have some input into the development of a specific proposal for a water elevation control structure either from the standpoint of the impact of that structure or the permits required for construction. It is anticipated that each individual attending will be prepared to present specific detailed information regarding permits, constraints on the elevation to which water can be impounded and positive and negative impacts that such an activity may have in the lower Irondequoit Basin.

The concept is to build a dam at the narrows to allow increased attenuation of storm waters, and during spring runoff to allow water to be held at an elevation adequate to encourage spawning of northern pike in certain areas of Ellison Park. The spring retention period would be for a three to four week period in late March and early April. The evaluation of these wetlands for pollutant attenuation and uptake is part of the National Urban Runoff Program work plan, and funds are described in that work plan for construction of a control structure.

The issues to be dealt with at this meeting relate to:

1) The constraints that exist on the maximum elevation to which water can be impounded. This deals with;

   a) upstream flooding, especially in the Parnorama Plaza area; this will be addressed by Dave MacPherson of the Corps of Engineers. I discussed this project with people at the Buffalo District Office in mid-1979, and it was felt at that time that the backwater elevation would not impact the flood hydrograph if it was restricted to something less than a maximum elevation of seven feet above mean water levels.

   b) A second consideration is downstream flooding in the area upstream of the control structure in the Towns of Brighton and Penfield. The town supervisors of Brighton and Penfield and their public works and conservation department staff have been asked to attend to address this as well as the Parks Department as the flooded area would be largely the central and northern sections of Ellison Park.

   c) A third constraint to the maximum impoundment of water would be the effect on the wetlands plants themselves. Under certain conditions of backwater elevation, it could be expected that cattails would be uprooted and that a negative impact would be realized.

d) A fourth consideration is the elevation that might be required to encourage the spawning of northern pike. John Forney and Carl Widmer from Cornell and DEC have been invited to address this point. It will likely require a field visit for them to take a closer look at substrate conditions in the park, and in the wetlands, to make some judgment regarding the minimum elevation that might be required in the period of pike spawning.

2) The second major area of concern is that of permits. It is anticipated that there will be federal, state and local permits required. The Corps of Engineers permit people will be on hand as will DEC permits staff from the Region 8 Avon office. Town permit requirements can be addressed by representatives of the two towns in question; Brighton and Penfield and other local permit considerations will be addressed by Chuck O'Neil of the Environmental Management Council; especially with reference to local SEQR requirements.

3) The third area for discussion is the control structure itself with consideration as to alternatives for construction and for preparing an adequate berm on the west side of the narrows. We would like to explore involvement of the Towns of Brighton and Penfield in berm preparation and discuss access for construction. Costs will be discussed to the extent that they can at this time.

The design and cost of the control structure will be discussed, and the possible requirements for a fish ladder for spawning and the steel head run.

4) The long term maintenance and operation of such a structure should it be built. As all parties have an interest in that it would be worthwhile to develop a preliminary plan for long term care and maintenance and hopefully the participants will come prepared to express their opinion and position regarding their involvement in maintenance and operation.

The following is a list of those individuals who have indicated that they anticipate being in attendance and their affiliation:

John Forney - Cornell Experimental Station at Oneida Lake, an expert in the spawning of northern pike

Carl Widmer - Avon office of the Department of Environmental Conservation, in charge of the fisheries area

Larry Myers - Avon office of the Department of Environmental Conservation, in charge of the wildlife section

Frank Keller - Avon office of the Department of Environmental Conservation, a liason for 208 and NURP program work

Elmer Wagner - Avon office of the Department of Environmental Conservation, in charge of the permits branch of that office

NURP Program Staff:

Ted Tift - O'Brien and Gere Engineers, consultant to that project

Robert Galucci - Program Manager for the Pure Waters Division

Bob Jonas - Chairman of the Public Participation Subcommittee for NURP and related projects

Bill Kappel - United State Geological Survey - Ithaca

Corps of Engineers:

Dave McPherson - has worked on and is currently in charge of the Corps of Buffalo district office investigations regarding flood control in the Irondequoit Basin. Dave has indicated that he expects to bring some permits branch people from his office.

Towns of Brighton and Penfield:

Anna Bundschuh - Supervisor - Town of Penfield

Richard Wiles - Supervisor - Town of Brighton

DPW and Conservation people will be in attendance

Parks Department

Calvin Reynolds - Director of Parks

Anthony Mattuci, foreman of Ellison Park

Environmental Management Council:

Chuck O'Neil - who specializes in SEQR review and other aspects of wetlands management programming

Copy to: Those listed above and
N. G. Kaul - DEC Albany
J. Davis - Pure Waters
D. Day
G. R. Sutherland
Dr. Redmond

RSB:emz

effect not only on the success of this workshop but also on prospects for additional workshops of this kind in the future.

Dated: February 6, 1981.

Edwin H. Clark II,

Acting Assistant Administrator for Pesticides and Toxic Substances.

[FR Doc. 81-5078 Filed 2-12-81; 8:45 am]

BILLING CODE 6560-31-M

[ER-FRL-1754-5]

Availability of Environmental Impact Statements

AGENCY: Office of Federal Activities (A-104) U.S. Environmental Protection Agency.

PURPOSE: This notice lists the environmental impact statements (EIS) which have been officially filed with the EPA and distributed to Federal agencies and interested groups, organizations and individuals for review pursuant to the Council on Environmental Quality's regulations (40 CFR Part 1506.9).

PERIOD COVERED: This notice includes EIS's filed during the week of February 2, 1981 to February 6, 1981.

REVIEW PERIODS: The 45-day review period for draft EIS's listed in this notice is calculated from February 13, 1981 and will end on March 30, 1981. The 30-day review period for *final EIS's as* calculated from February 13, 1981 will end on March 16, 1981.

EIS AVAILABILITY: To obtain a copy of an EIS listed in this notice you should contact the Federal agency which prepared the EIS. This notice will give a contact person for each Federal agency which has filed an EIS during the period covered by the notice. If a Federal agency does not have the EIS available upon request you may contact the Office of Environmental Review, EPA, for further information.

BACK COPIES OF EIS'S: Copies of EIS's previously filed with EPA or CEQ which are no longer available from the originating agency are available with charge from the following source: Information Resources Press, 1700 North Moore Street, Arlington, Virginia 22209 (703) 558-8270.

SUMMARY OF NOTICE: This notice sets forth a list of EIS's filed with EPA during the week of February 2, 1981 to February 6, 1981. The Federal agency filing the EIS, the name, address, and telephone number of the Federal agency contact for copies of the EIS, the filing status of the EIS, the actual date the EIS was filed with EPA, the title of the EIS, the State(s) and county(ies) of the proposed action and a brief summary of the proposed Federal action and the Federal agency EIS number, if available, is listed in this notice. Commenting entities on draft EIS's are listed for final EIS's. All additional information relating to EIS's such as time extensions or reductions of prescribed review periods, withdrawals, retractions, corrections or supplemental reports is also noticed under the appropriate agency.

FOR FURTHER INFORMATION CONTACT: Kathi L. Wilson, Office of Federal Activities, Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460 (202) 245-3006.

Dated: February 10, 1981.

William N. Hedeman, Jr.,

Director, Office of Federal Activities (A-104).

U.S. Army Corps of Engineers

Contact: Mr. Richard Makinen, Office of the Chief of Engineers, Attn: DAEN-CWR-P, Office of the Chief of Engineers, U.S. Army Corps of Engineers, 20 Massachusetts Avenue, Washington, D.C. 20314 (202) 272-0121.

Draft

IRONDEQUOIT CREEK WATERSHED FLOOD PROTECTION: Monroe County, N.Y., February 3: Proposed is a flood protection plan for the Panorama Plaza area of the Irondequoit Creek Watershed in Monroe County, New York. The preferred alternative would involve: (1) a series of levees or flood walls along Irondequoit and Allen Creeks, (2) Internal drainage ditches along the back of the levees, (3) Culverts with flaggates and emergency sluicegates, and (4) Channelization realignment. (Buffalo District). (EIS order No. 810101).

Extension: The review period for the above EIS has been extended until April 30, 1981. (No. 810101).

Final

BOWLINE POINT GENERATING STATION: Rockland County, N.Y., February 3: Proposed is the continuance of permits for the operation of the Bowline Point Generating Station located on the Hudson River in Haverstraw, Rockland County, New York. The facility consists of two oil fueled steam electric generating units and related facilities. The alternatives consider: (1) Retain unaltered the permit and related conditions, (2) Modify conditions of the permit, (3) Suspend permit until closed-cycle cooling and or modifications are installed, and (4) Revoke permit. This statement also examines the continued operation of Roseton Station. (New York District). Comments made by: USDA, DOC, EPA, HEW, HUD, DOI, DOT, State and local agencies, groups and businesses. (EIS order No. 810100).

DEPARTMENT OF AGRICULTURE

Contact: Mr. Barry Flamm, Director, Office of Environmental Quality, Office of the Secretary, U.S. Department of Agriculture, Room 412-A, Administration Building, Washington, D.C. 20250, (202) 447-3965.

Forest Service

Draft

Stibnite gold mine and mill, operation approval: Valley County, Idaho, February 2: Proposed is the approval of an operating plan for the mining and processing of gold ore located at the Stibnite mine properties within the Payette National Forest in Valley County, Idaho. The project would include two open pit mines, waste dumps, heap leaching facilities, personnel housing and associated transportation corridors. Alternatives are considered for various aspects of the project including mining areas and methods, facility locations, disposal, material transport, processing methods and materials, power sources and access corridors. (EIS Order No. 810099).

Mt. St. Helens Land Mgmt. Plan, Gifford Pinchot NF: Cowlitz, Lewis, and Skamania Counties, Wash., February 4: Proposed is a land management plan for Mount St. Helens within the Gifford-Pinchot National Forest in Cowlitz, Lewis and Skamania Counties, Washington. The preferred alternative would provide a large interpretive area for protection of significant geologic and biologic features, while providing for timber salvage and rehabilitation in some of the heavily damaged areas. Other allocations included are: (1) Unroaded recreation, (2) Prime habitat, (3) Existing research natural areas, (4) A botanical area, (5) General forest, and (6) A Tephra area. The cooperating agency is the geological survey. (EIS Order No. 810102).

EXTENSION: The review period for the above EIS has been extended until April 2, 1981. (No. 810102).

Final Supplement

San Antonio Channel Improvement (FS-1): Bexar County, Tex., February 2: Proposed is a channel improvement project for the San Antonio channel in Bexar County, Texas. The alternatives considered no action, structural and nonstructural measures. Nonstructural measures considered are flood proofing of existing structures, flood warning system and flood plain evacuation. Structural alternatives considered are: (1) Vertical wall cross sections, (2) A grass lined trapezoidal channel cross section, and (3) A combination of cross sections. This statement supplements a final EIS, No. 721179, filed 11-9-71. (Fort Worth District). Comments made by: EPA, DOI, AHP, USDA, DOC, FERC, HUD, DOT, VA, State and local agencies. (EIS Order No. 810097).

Grays Harbor and Chehalis River Navigation (FS-1): Grays Harbor County, Wash., February 4: Proposed is the continued maintenance of the Grays Harbor Chehalis River navigation Project in Grays Harbor County, Washington. The main navigational channel is segmented into four parts for which maintenance dredging requirements are considered individually. The alternatives considered: (1) Yearly coordination of dredging plan, (2) Modify the present long range maintenance plan, and (3) Implement long range plan without change. This statement supplements a final EIS, No. 751683, filed 11-20-75. (Seattle District). Comments made by: AHP, DOC, DOI, EPA, State and local agencies, groups. (EIS Order No. 810105).

New York State Department of Environmental Conservation
6274 E. Avon-Lima Rd., Avon, New York 14414

Robert F. Flacke
Commissioner
Eric A. Seiffer
Regional Director

May 30, 1980

Colonel George P. Johnson
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Att: Mr. Frapwell

Gentlemen:

On 5/8/80 a joint inspection of the proposed flood control project on Allens Creek, Town of Pittsford, Monroe County, New York, was conducted by the Corps of Engineers, USFWS and DEC. The project originally proposed by the Corps is a 900 foot channel section involving a 300 foot of friction channel a new depth 7 foot lower than existing conditions and a 600 foot straight channel to Irondequoit Creek. This alternative would result in significant impacts to the stream ecology and riparian habitat of Allens Creek and is unacceptable to the Division of Fish and Wildlife, DEC. Several other alternatives were discussed at the 5/8/80 meeting.

1. Construct the project on the existing stream meander pattern maintaining the existing riparian habitat. This alternative would avoid channelization of the stream into a straight channel however the width of bottom needed and the 7' depth would result in loss of most of the riparian habitat. This alternative would also adversely impact the fish and wildlife resources. Mitigations and enhancement measures could be taken to offset some of the impacts.
2. Construct the project with several drop structures instead of the friction channel. A 7' drop structure is unacceptable, it would serve as an impassable barrier to fish movement. Several 3 foot drop structures would be more desirable. They would provide habitat, add oxygen to the stream and not block fish movement. However, with a deep cut in the stream riparian vegetation will be lost when proper slopes are provided. A 7 foot deep channel 50 feet wide with 1 on 2.5 slopes will result in an 85 foot wide disturbed area.

3. Construct a new channel on the upstream end of the project tying into the existing stream channel at the end of the shortened friction channel and maintaining the existing meander pattern from there downstream. This alternative will also result in loss of riparian habitat if a 7' deep channel is provided. This alternative would be more acceptable if the deepening was minimized to a maximum of 3' and a flood dike was placed between the new channel and the Sybron plant. By moving the stream over, more room would be available for construction of flood control dikes.
4. A project involving: minimal deepening, less than 3', with a drop structure clearing and snagging of woody debris, redefining the channel and improving the confluence to provide better entry into Irondequoit Creek, would be the most environmentally acceptable alternative.

Environmental enhancement measures such as drop structures, deflectors, rip-rap habitat, vegetative plantings and other habitat improvements could be used to make the projects more acceptable.

Allens Creek has been severely impacted in the past by construction activities, point and non point source pollution and unregulated channel work. However, water quality conditions are improving. The existing stream has excellent potential for rehabilitation by trout and utilization by lake run spawners. The stream has a rock rubble bottom acceptable for spawning and excellent riparian habitat which provides shade and cover for fisheries and terristerial wildlife.

If I can be of further assistance on the project please feel free to contact me at 716-226-2460.

Very truly yours,

Jack Cooper
Habitat Protection Biologist
Region #8

JC:er
cc: P. Hamilton, USFWS

UNITED STATES GOVERNMENT

memorandum

DATE: May 19, 1980

REPLY TO ATTN OF: Biological Technician

SUBJECT: On-Site meeting with Corps of Engineers and DEC regarding Irondequoit Creek Flood Control Project

TO: Field Supervisor
Files

On Thursday, May 8, 1980 Mark Clough met with Phil Frapwell and Dave McPherson, Buffalo CE, and Jack Cooper, DEC Avon, to discuss alternatives proposed for Allen Creek as part of the Irondequoit Creek flood control project. The Corps is developing a levee plan for Irondequoit Creek which takes under consideration the concerns and suggestions discussed at the 2/20/80 meeting between FWS, Corps, and DEC personnel. However, in order to facilitate such a plan, additional work along Allen Creek is needed to reduce stream velocities and erosion. Several schemes have been proposed, all of which involve channel work along Allen Creek from the mouth to about 900 feet upstream.

Preliminary concerns and possible modifications were discussed on site and will be forwarded to the Corps by copy of this memo for consideration in their selection of a proposed plan.

Development of plans for work along Allen Creek should provide for maintenance of suitable fisheries habitat and allow for passage of migrating fish. Preliminary concerns and suggestions are as follows:

1. The need for a completely realigned channel is questionable. Relocation of the channel should be avoided, with channel work following the existing alignment, leaving the meandering character of the stream intact.

2. Use of riprap on outside banks and possible removal of some inside bank material and vegetation should be considered where erosion problems with severe bends occur.

3. Channel work should be confined to one bank wherever possible to preserve some of the existing cover, with plans included for revegetation of disturbed areas.

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6
5010-112

4. A low flows channel should be provided to allow fish passage through the entire length of the project area. The low flow channel should be located to one side, or meander from side to side, to take maximum advantage of riparian cover.

5. Measures should be included to provide for fisheries habitat features within the channelized section. Leaving some snags intact, placement of boulders, and use of pool diggers or other devices should be considered.

6. The proposed drop structures or friction channel should not act as a barrier to fish passage. Two or more lower structures would be preferable to one 7 foot drop. The maximum passable height under the predicted flows should be determined. A 3 foot structure may present problems without adequate flow and consideration should be given to passage of forage species as well as larger fish.

7. A properly designed friction channel with unevenly placed stones of varying sizes to create a continuous succession of small pools and resting places may be more effective. This should be investigated further and coordinated with DEC fisheries personnel.

8. Fish sampling along Allen Creek would be of value and should be conducted in conjunction with the current sampling on Irondequoit Creek.

Mark W. Clough

Mark W. Clough

cc: Buffalo CE, Attn: Phil Frapwell

United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
SOUTHEAST REGIONAL OFFICE
75 Spring Street S.W., Suite 1176
Atlanta, Georgia 30303

IN REPLY REFER TO:

W540
1201-02(a)

MAY 9 1980

Mr. Donald M. Liddell
Chief, Engineering Division
Buffalo District, Corps of
Engineers
1776 Niagara Street
Buffalo, New York 14207

Attn: Mr. Richard H. Lewis

Dear Mr. Liddell:

Enclosed are one reviewer's comments concerning the report "Cultural Resources Survey of Irondequoit Creek" by Francis J. Clune, Jr.

Our reviewer has found the report inadequate and not properly addressing the scope of work.

If you have any questions, please do not hesitate to call Mr. James W. Thomson, Review Coordinator, at 404-221-2633. We appreciate the opportunity to review the report.

Sincerely,

for Wilfred M Hustead
Stephanie H. Rodeffer
Acting Chief

Enclosure

UNITED STATES GOVERNMENT

memorandum

DATE:

REPLY TO ATTN OF: Archeologist, IAS-Atlanta

SUBJECT: Review of the report entitled Cultural Resources Survey of Irondequoit Creek by Francis J. Clune, Jr.

TO:

Archeologist, IAS-Atlanta

This cultural resources survey report is in my opinion, inadequate and does not fulfill the requirements of the Scope of Work. The report is poorly written and needs a strong editorial hand. It is also poorly organized and lacks continuity in its presentation of topics. Background sections are brief and vague. The author should discuss culture history, ethnohistory, history, literature search methodology and results as separate sections and not switch haphazardly from one topic to another.

The abstract should identify who carried out the research, the funding source, and the purpose of the research. It should also provide a brief summary of the methodology followed and its result, as well as any conclusions and recommendations.

The geology section could be expanded to include a more detailed discussion of glacial history and a soil map to illustrate the discussion on area soils. The report should also discuss the flora of the area, as well as any evidence of environmental change.

The culture history section should be expanded in such a way as to provide the reader with a perspective of the prehistory of the region as it relates to the project area.

With respect to survey methodology, it would seem more appropriate to have carried out a combined shovel test and augering program if the investigator had reason to believe that there may be buried sites in the area. Furthermore, the rationale for carrying out 50-foot interval shovel tests is a circular argument at best.

Lastly, it would help if the maps presented in this report were incorporated into the body of the text for easy reference. If possible, historic maps of the project area could be included as well.

Karen Anderson Cordova

Karen Anderson Cordova

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6
5010-112

THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
CULTURAL EDUCATION CENTER
ALBANY, NEW YORK 12230

NEW YORK STATE MUSEUM

April 8, 1980

Mr. Donald M. Liddell, Chief
Engineering Division
Buffalo District, Corps of Engineers
U.S. Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell,

RE: CULTURAL RESOURCES SURVEY OF
IRONDEQUOIT CREEK
Report by Clune & Johnson

I appreciate the opportunity to review and comment on this report. At this time I have the following observations to make, which I trust will be of some use in your own final review of this study.

1) It is difficult for the person unfamiliar with the project to locate the project, as no location data of a general nature are given. The title and the project description section should include the county, city, or other location data by which the reader can tie this report into maps and other data which the reader may have on file for comparative purposes. Since archeological work is usually conducted from the topographic base of the USGS series of maps, the name of the appropriate USGS 7½' quad map(s) should be cited also.

2) The file search phase of the study is poorly defined, and appears to be primarily a recapitulation of the work already done by Prisch in 1976. Although the statewide site files of this museum contain no sites closer than 3,000 feet to the project area, any general survey should include the consultation with us for such data in order to better anticipate the range of prehistoric resources one could expect.

3) The discussion of how and why test unit excavation was carried out is vague and confusing. "A change in soil color" does not always mean culturally sterile conditions, particularly in floodplains where bands of light colored silts may conceal rich cultural deposits at greater depths. In such cases the "change in soil color" is often merely the bottom of the plow zone, and much deeper testing is needed to locate impacted sites. The fact that the test units "range in size from one to three feet in diameter" means that data was not comparable from one area of the project to another. Unless test units remain constant

in size, the relative return of artifacts and the accurate interpretation of sub-surface stratigraphy cannot be interpreted or evaluated.

While there is mention of the recording of soil data during excavation, there is no mention of cultural data, such as artifacts, features, etc. The retrieval of artifactual data is apparently left until after the soil has been removed and piled beside the test unit, which leads to loss of in situ data and makes accurate interpretation of the evidence impossible, or it is left until the backfilling operation, which is of course a reversal of the correct approach to excavation. (See page 9 of the report for the above points.)

4) The last six lines of the central paragraph on page 10 talks about the "distinct possibility" that some "minor alterations" could have teken place in the course of the creek itself. Apparently no research was conducted to clarify this or to explore what impact the major construction associated with the Panorama Plaza might have had on the creek alignment. A very cursory examination in this office of USGS topographic maps for the year 1934 and the year 1971(revised 1978) shows that a very major realignment of Irondequoit Creek took place between those years (See attached map).

5) The surveyed area (see map on page 22) appears to be about 1,000 feet shorter than the study area indicated on the Army maps in the contract. Also, an area on the north end of the project (see map in contract) where the words "Irondequoit Creek" appear was not tested, but only the flood wall location was tested. Yet sites in this larger area would be impacted by this project, and the contract calls for an evaluation of such.

6) The photographs should be tied to the maps in some way and the camera position and photograph orientation should be shown.

I hope these comments are of value.

Sincerely Yours,

PHILIP LORD, JR., Senior Scientist
Office of State Archeologist

NEW YORK STATE PARKS & RECREATION Agency Building 1 Empire State Plaza Albany New York 12238 Information 518 474 0456
Orin Lehman, Commissioner

3176

April 15, 1980

Mr. Donald M. Liddell
Chief, Engineering Division
Dept. of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

Cultural Resources Survey
of Irondequoit Creek

The State Historic Preservation Officer (SHPO) has reviewed the above-referenced report. Based on this review, the SHPO wishes to make the following comments.

From the Abstract, it seems the author does not consider Victorian structures as historic. The SHPO cannot agree with this assertion across the board; however, since no such resources were found, the author's statement does not appear important in this instance. On page 9 of the report, the author makes a statement about the SHPO which is incorrect. The SHPO does not recommend 50 feet in all areas where no clear evidence of disturbance exists. The SHPO does recommend the preparation of a model based on a few environmental parameters, known sites, local history and past disturbances. This model should be used to justify a sampling scheme.

Despite these comments, the report does adequately cover the project area. The basic conclusion that no resources eligible for the National Register were found does seem justified and therefore the report is acceptable to the SHPO.

Sincerely,

Ann Webster Smith

Ann Webster Smith
Deputy Commissioner for
Historic Preservation

TOWN OF PENFIELD • 3100 Atlantic Ave.
Penfield, N.Y. 14526

March 24, 1980

Mr. Charles Gilbert
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Re: Application of James Welch Assoc. for the development of a 152,000 sq. ft. shopping plaza located at the northwest corner of Panorama Trail South and Route 441

Dear Mr. Gilbert:

The Penfield Planning Board is now considering the above referenced application, (plans pertaining to which are enclosed for your review) and wants your office to be aware of it in connection with the Corps investigation of the feasibility of providing flood-damage reduction measures in the Panorama area of the Irondequoit Creek watershed.

We would appreciate your timely recommendations in connection with this application. For further information regarding this matter, you may contact Anthony Malone, our Town Engineer, at Hershey-Malone & Associates, 2480 Browncroft Blvd., Rochester, New York 14625, phone 381-9250, or my office.

Yours truly,

David W. Curtis

David W. Curtis
Planning and Zoning Officer

DWC/sm

TOWN OF PENFIELD

3100 Atlantic Ave
Penfield, N.Y. 14526

February 13, 1980

Mr. Charles Gilbert
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, N. Y. 14207

Re: Application of Dolomite Products Co. for the renewal of a Commercial Excavation Permit to operate a sand plant located at 1530 Penfield Road

Dear Mr. Gilbert:

The Penfield Planning Board is now considering the above referenced application, (documents pertaining to which are enclosed for your review) and wants your office to be aware of it in connection with the Corps investigation of the feasibility of providing flood-damage reduction measures in the Panorama area of the Irondequoit Creek watershed.

We would appreciate any recommendations you may have in connection with this application. You may contact Anthony Malone, our Town Engineer, at Hershey-Malone & Assoc., 2480 Browncroft Blvd., Rochester, N. Y. 14625, phone 381-9250, or my office.

At the information meeting held August 21, 1979, you indicated that you would be meeting with local officials early in 1980 to work out details of your Panorama Plaza proposal. I know the Corps has met with out Sewer Superintendent Sidney Lusk to discuss use of an abandoned pump station and with Parks and Recreation Director Paul M. Rood to discuss parkland behind the Plaza.

We look forward to working with you to minimize the flood hazard in the Panorama area.

Yours truly,

Anna R. Bundschuh
Supervisor

ARB:bf
cc: Don Martin, Monr.Co.Dept. of Planning
Anthony Malone, Hershey-Malone Assoc.
Planning Board File
Applicant

County of Monroe

NEW YORK

DEPARTMENT OF PLANNING
301 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

DON B. MARTIN, DIRECTOR

TELEPHONE:
(716) 428-5461

September 14, 1979

Donald M. Lidell, Chief
Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Subject: Review of the Irondequoit Creek Watershed Preliminary Feasibility Report on Flood Damage Control. (File #79-243-F)

Dear Mr. Liddell:

Thank you for the opportunity to review the subject report. The Monroe County Planning Department and the Monroe County 208 Water Quality Management Planning Committee have each reviewed this report. As you know, the Planning Department has been following this study closely since June, 1976. The 208 committee, which I chair, was established more recently to explore ways to work in cooperation with appropriate state and federal agencies to find ways to improve water quality through reduction of non-point source pollution. Thus, the committee has particular interest in the solutions the Corps is proposing for flood damage control, and I have included these concerns in this review. The comments of the Planning Department and the 208 Committee are attached to this letter.

Please feel free to contact me at (716) 428-5476 or John Lamb at 428-5468 if you have any questions on these comments.

Sincerely,

Don B. Martin
Director of Planning and
Chairman, Monroe County 208
Water Quality Management Planning Committee

DBM:JML:cm
Attachment - (3 pages)
xc: Lucien A. Morin, County Manager
Betty Jane Altier, Chairperson, Monroe County Planning Board
George Gardner, Chairman, Monroe County Planning Council
Richard Wiles, Supervisor, Town of Brighton
John Kelly, Supervisor, Town of Henrietta
Roberta Barnes, Supervisor, Town of Mendon
Irene Gossin, Supervisor, Town of Penfield
Lake Edwards, Supervisor, Town of Perinton
Paul Spiegel, Supervisor, Town of Pittsford
Douglas Fisher, Supervisor, Town of Victor
Raymond Parrish, Supervisor, Town of West Bloomfield
Monroe County 208 Water Quality Management Planning Committee

Comments of the Monroe County Planning Department and the Monroe County 208 Committee on the Preliminary Feasibility Report of the Corps of Engineers on Flood Control Measures for the Irondequoit Creek Watershed

The preliminary feasibility report recommends two flood damage control structural alternatives to protect Panorama Plaza (levee/floodwall and channel/berm), and recommends that non-structural measures such as control of development in floodplains through regulations and evacuation procedures, be instituted in the remainder of the watershed. The report recommends that further analysis of the three alternatives be undertaken for the purpose of preparing the final feasibility report which will recommend either a specific plan to deal with flood control or that no action be taken.

The report mentions that other structural measures, such as reservoirs, were considered for use in other upstream portions of the watershed but that these structural measures did not meet the required benefit/cost (b/c) ratio of one or greater, which is the ratio required before the Corps can undertake a structural solution. However, these other measures were only analyzed from the standpoint of flood control. They were not analyzed in terms of the multipurpose benefits they could provide in the areas of recreation and water quality, two of the areas that are required for analysis by the Corps under the original Plan of Study.[1] The Planning Department has long favored the analysis of reservoirs/retention ponds for use as flood control measures because of their multiuse potential and the 208 Committee is interested in the use of such facilities to help achieve improved water quality in the creek by providing a place for settling of sediments. Perhaps, when the multipurpose benefits of reservoirs/retention ponds are considered along with flood control, these alternatives will provide a b/c ratio of one or greater. Therefore, it is recommended that before any selection is made regarding the best structural method(s) for flood control, that other alternatives, such as reservoirs/retention ponds, perhaps in conjunction with other structural and non-structural measures be evaluated to see if they would better meet the total water resource needs of the watershed in a cost effective manner.

In addition to the above comment, which reflects the concerns of both the Planning Department and the County 208 Committee, there are specific comments of the Planning Department and the 208 Committee, listed separately below:

A. Planning Department Comments

1. It was suggested by staff at the public informational meeting held on the preliminary feasibility report, held at Penfield High School on August 21, 1979, that in addition to analyzing the multipurpose potential of reservoirs/retention ponds to determine their b/c ratio, the Corps look at the cumulative b/c ratio of all the various flood control measures which could be used in the watershed, including the multipurpose ones, to see if taken together, a b/c ratio of one or greater would be achieved. Again, this might help to better achieve the overall water related needs of the watershed, for it may result in the inclusion of a measure that provides recreational, water quality of other benefits, in addition to a degree of flood control, and would be consistent with the Corps' Plan of Study.

---

[1] Plan of Study Irondequoit Creek, New York, and Tributaries including Allen Creek, for Flood Control and Allied Purposes (revised September, 1976). Page 2 of this report charges the corps with evaluating the "immediate and long run water related needs of the area", and includes among its objectives ones which seek to improve water quality and recreational opportunities in the watershed. Water quality, as a related need, is again stated on pages 44, 45 of this preliminary report.

Related to this, it was noted that various speakers at the informational meeting indicated a preference for non-structural approaches to flood control. The consideration and inclusion in the study of alternative measures, such as those with multipurpose potential, might result in a reduction of the magnitude of the structural solutions proposed at Panorama Plaza, making them more acceptable.

2. The Planning Department has been involved in this study for over three years. During this time one of the biggest problems in terms of maintaining local involvement and interest in the program has been the infrequency with which progress meetings have been held (this point was also raised at the August 21 meeting). Typically, several months elapse between meetings with the result that participants lose interest and there is a certain amount of attrition as agency representatives, elected officials and other local participants change or leave office. This results in information gaps, a lack of continuity to the program and a significant re-education effort. While this occurs during any long-term study such as this, this study is particularly vulnerable to this problem due to the infrequency of meetings. However, local interest and involvement is essential if the program is going to be successful and if local confidence is to be maintained.

   This as well as other problems, such as a need for a local policy advisory group to give direction to the Corps, were pointed out in a letter to the Corps from the Planning Department, dated September 5, 1978. Shortly after that, a meeting was held on September 28. However, the next meeting did not take place until the August 21, 1979 meeting (and to further underscore this problem, the next meeting is not scheduled until December, 1979 or January, 1980). Therefore, we urge you to do whatever possible to maintain local interest and involvement in the program through more frequent contact and through improved communication.

B. 208 Committee Comments

1. Monroe County and the State of New York, through funds available from the Federal National Urban Runoff Program (NURP), is proposing studying the benefits of constructing multipurpose reservoirs along the creek as part of an urban runoff water quality study in the watershed. We would be anxious to coordinate this investigation with any broader evaluation of study alternatives mentioned in the joint comment above, that may be undertaken by the Corps of Engineers.

2. We recommend that the preliminary feasibility report make mention of the water quality study which Monroe County and the State Department of Environmental Conservation will be undertaking in the Irondequoit Creek Watershed. This multi-year study, expected to be initiated during federal fiscal year 1980, with primary funding from EPA through its NURP program and the federal 208 program, will address the urban runoff and other non-point source urban runoff pollution problems in the Irondequoit Creek Watershed. As proposed, the study has two main objectives: (1) to determine the level of urban runoff pollution and (2) to determine the effectiveness of various management techniques for minimizing non-point source pollution.

Part of the study will involve monitoring the water quality in several areas of the watershed to determine the specific nature and magnitude of the non-point source pollution problem. Also, several control measures aimed at reducing this pollution will be evaluated including the development of multiple use reservoirs along Irondequoit Creek. In developing a water quality management plan for the watershed, the main emphasis will be on local regulations and small-scale structural improvements.

3. On page 81, the report mentions that the "Pure Waters Agency is the local sponsor implementing New York State's 208 program." More accurately, Monroe County is part of the "non-designated" portion of the state for 208 Water Quality Planning and as such, ultimate responsibility for 208 planning rests with the State of New York Department of Environmental Conservation (DEC). However, DEC, in its State 208 Plan, supports active county participation in refining and implementing the State 208 Plan. As a result, Monroe County has recommended the Monroe County Administration be the principal agent for carrying out the 208 program locally. In addition, within Monroe County, the County Manager has appointed an advisory committee, known as the Monroe County 208 Water Quality Management Planning Committee, to coordinate state 208 activities as they affect Monroe County. This committee is made up of members of several County agencies including the Division of Pure Waters, the Environmental Management Council and the Departments of Health and Planning, as well as local officials and business and industrial representatives.

Pkg 1st.

STATE OF NEW YORK
DEPARTMENT OF AGRICULTURE AND MARKETS
J. ROGER BARBER, COMMISSIONER
ALBANY, NEW YORK 12235

September 14, 1979

Mr. Donald M. Liddell
Chief, Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Mr. Liddell:

The Irondequiot Creek Watershed, N.Y., Preliminary Feasibility Report, July 1979, has been reviewed on behalf of the New York State Department of Agriculture and Markets. Both structural plans are proposed in the urbanized area of the Panorama Plaza so no active important farmland is expected to be taken out of production. However, we in the Department have some general comments concerning the watershed as a whole. They are as follows:

1. Viable agricultural production is ongoing in many areas of the watershed though suburban development and farmland encroachment has occurred on Important Farmlands in closer proximity to the City of Rochester over time. Attachment #1 indicates agricultural districts which have been formed as of March 1979 in the area and part or all of those which have been shaded yellow are located in the watershed. This is only one indication of viable agriculture that exists and is supportive of the statement on page A-9 pertaining to agricultural land in areas south of the barge canal. Many agribusinesses are located in Rochester's metropolitan area which process, market and/or support the production of agricultural goods and products grown in Central and Western New York. Much of New York's best farmland is found in this and neighboring watersheds. The enclosed map* and attachement #2 which is a description of Important Farmland in New York, further emphasizes this fact. It is hoped that actions taken by this proposal will not jeopardize drainage systems of productive agricultural lands in the watershed.

2. If substitute storage capacity should ever be needed (Re: "g", p.96) precautions should be made to ensure more encroachment of existing productive farmland does not prevail. Scattered non-agricultural development on important

*For the most part this map generally outlines Important Farmland soils on a statewide basis; any detailed planning should utilize local-county survey maps which are available at the county soil and water conservation district. A few areas have been shaded incorrectly on this state map and the revised map will be available within a month or so. The State USDA-SCS office in Syracuse, New York (or myself) can furnish you a copy at that time upon request.

farmlands in New York should not be advocated unless a national overriding interest prevails. (USDA Secretary's Statement on Land Use Policy, Memorandum #1827, revised, 10/31/78).

3. It is important to recognize New York State's Soil and Water Conservation Districts (SWCD's) in any watershed planning. They were not discussed under the "Institutional Analyses" section (beginning on page 66) regarding organizations involved in drainage and land use planning. For your information there is a differentiation between the USDA - Soil Conservation Service (as portrayed on page 70) and SWCD's. A brief understanding of these roles are described below:

Soil and Water Conservation Districts in New York State, with technical assistance from USDA-SCS, work at the local county level to assist individual landowners and users and units of government with planning and installing conservation practices, with onsite planning of soil and water-related problems, and with soil interpretations for land use. In addition, they are functional in other public input activities. Each Soil and Water Conservation District (SWCD) consists of a Board of Directors and its district employees. The Attorney General has ruled that each SWCD is a politicial subdivision of the State of New York (having the same boundary as its county) and is a legal branch of the New York State Soil and Water Conservation Committee (NYS SWCC). The NYS SWCC is a state agency and its members include the Commissioners of NYS DEC and NYS A&M, as well as the director of the state Agricultural Extension Service, the dean of the State College of Agriculture and Life Sciences, the president of the College of Environmental Science and Forestry of the SUNY and the State Conservationist of USDA-SCS. USDA-SCS places a "District Conservationist" in each of the 57 SWCD(s) as the lead technical person who provides technical assistance for ACP referrals and/or other district work for the county SWCD.

For your information, the New York State SWCC which sets policy and provides direction and guidance to SWCD(s), is designated by NYS DEC (the water quality management agency of NYS) as the agency to administer the agricultural nonpoint source implementation program at the state level. SWCD(s) will be instrumental in the evaluation, the interpretation, the development of BMP solutions to the identified problem, and the installation of BMP at the local level. Efforts to coordinate activities with county SWCD's provides a practical approach through an agency which local governments and citizens can relate to and work with in applying solutions.

We appreciate this chance to comment.

Sincerely,

Louise A. Inglis

Louise A. Inglis
Rural Development Specialist

LAI/t
Enc.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

100 Grange Place
Room 202
Cortland, New York 13045

September 13, 1979

Colonel George P. Johnson
District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

We have reviewed the Preliminary Feasibility Report dated July 1979 for proposed flood damage reduction measures in the Irondequoit Creek Watershed, New York. These comments are provided to assist in your preparation of the Final Feasibility Report and are not the comments of the Department of the Interior, as outlined in Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The U.S. Fish and Wildlife Service previously provided comments regarding the Buffalo District Draft Plan of Study in a planning aid letter dated February 9, 1977, comments on the proposed scope of work for biological studies in a letter dated April 27, 1979, and a June 1, 1979 planning aid letter detailing our concerns relating to the proposed structural alternatives for the Panorama Plaza area.

General Comments

Several areas of concern relating to potential adverse impacts to fish and wildlife resources have not been adequately addressed in this report.

Specific Comments

Page 11, Environmental Concerns. Wildlife resources should be included in this section following the discussion of fisheries resources. Numerous wetlands and the existing riparian vegetation provide habitat for species of waterfowl, songbirds, and small mammals.

Page 84, Water Quality. The second paragraph of this section does not fully describe possible impacts to water quality associated with channelization. Sedement quality has not been determined and disruption of polluted sediments during excavation may result in more significant and long term adverse impacts in the project area and downstream.

Page 85, Fish and Wildlife. The second paragraph of this section does not adequately discuss potential adverse impacts to fishery resources resulting from channelization. The impacts that the resulting increased turbidity and decreased biological productivity mentioned in the section on water quality, would have on the fishery should be addressed. In addition to increased temperatures resulting from wide, shallow channels, other factors must be considered. Fish populations are also affected by loss of appropriate habitat features resulting from smooth channels, and alterations or reductions in benthic populations and other stream organisms which serve as a food source. The statement "Future hydraulic design modifications will mitigate the problem" without a more detailed analysis of the adverse impacts involved and specific plans to offset these impacts oversimplifies the situation and should be omitted.

Regarding the third paragraph of this section, one of the purposes for using set back levees is to preserve the shade and cover producing streamside vegetation. The statement about clearing of shade producing vegetation is accurate, however the need to eliminate the vegetation between the levees and the stream is questionable. The report does not indicate that this proceedure is inherent in project plans nor are the impacts of such clearing discussed in the terrestrial vegetation section on page 86. No mention is made of project related impacts to wildlife in this section. Possible impacts such as disruption, displacement, and loss of habitat should be addressed. In addition, information relating to State and Federally listed or potential endangered or threatened species should be included.

Page 86, Wetlands. Comments under p. 84 Water Quality apply. Release of pollutants by excavation of sediments could cause significant and long term impacts to valuable downstream wetland resources.

Page 86, Terrestrial Vegetation. This paragraph states that impacts would be minimal "due to the present stress on the vegetation caused by urbanization". In areas of expanding development, preservation of habitat to enable continued use of the area by fish and wildlife becomes even more important from both an ecological and an aesthetic point of view. Channelized areas and the use of floodwalls will involve alteration and destruction of some riparion vegetation. The extent and the significance of these losses should be described with regard to the importance of this vegetation in preserving the aquatic and terrestrial habitat in the area.

Page 89, second paragraph. In view of the above comments describing the various possible impacts affecting fisheries resources, a low-flow channel may not be sufficient to maintain adequate fisheries environment.

We appreciate the opportunity to provide comments and look forward to further coordination on the proposed Irondequoit Creek flood control project.

Sincerely yours,

Paul P. Hamilton

Paul P. Hamilton
Field Supervisor

NEW YORK STATE PLANNING AND DEVELOPMENT CLEARINGHOUSE
Division of the Budget/ State Capitol/ Albany, New York 12224/ (518)474-1605

August 23, 1979

Donald Liddell (NCBED-PN)
Chief, Engineering Division
Department of the Army
Corps of Engineers
1776 Niagara St.
Buffalo, NY 14207

Re: Direct Federal Development
Project: 27656
Feasibility Report
Irondequoit Creek Watershed
Monroe, Ontario & Wayne
Counties

Dear Applicant:

Notification of the above indicated project has been sent to state agencies for review via the A-95 State Clearinghouse system. The agencies were requested to inform us if they identified any problems and to submit any comments they might have. The agencies were provided 30 days (the usual review period under Part I of Circular A-95).

The end of the 30-day period has passed and we have received no statements identifying problems or making objection to the proposed project. Comments received, if any, are attached for your information.

We want to thank you for submitting this notification in accordance with Part II of Circular A-95.

Sincerely,

Thomas J. McDonald
State Clearinghouse
Administrator

TJM:lao

Att:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK NEW YORK 10007

SEP 7 1979

Mr. Donald M. Liddell
Chief, Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

The Environmental Protection Agency has received a copy of the draft feasibility report concerning flood damage reduction measures in the Irondequoit Creek Watershed, New York. The two structural alternatives under consideration are the levee/floodwall plan (Plan B) with a benefit-cost ratio of 1.3 and channelization/berm plan (Plan C) with a B/C of 1.8. We have examined the document and have a number of comments on the report.

Page F-12 discusses the fact that the diversion channel alternative was eliminated since it merely shifted flood damages downstream. The same, however, can be said for Plans B and C, since they also do not provide storage or detention capacity for the waters which cause flooding in the Panorama Plaza area. The document, moreover, does not state whether the downstream channel can handle the expected flow satisfactorily, nor the extent, if any, of flooding downstream at present.

The creek has a heavy growth of vegetation along its banks (Photographs). Removal of the vegetation, which will be a result in varying degrees of either of the structural alternatives, will help cause an increase in the creek's water temperature by removal of shade. This increase, while not always in itself serious, could cause irreparable damage to the existing and future fishery of the creek. Trout are known for their sensitivity to elevated temperatures. Anadromous steelhead trout traverse the area on their spawning runs (page 11). In the future, organic pollution in the creek will be alleviated due to various scheduled wastewater treatment facilities. This stretch of creek could then be capable of supporting a population of trout. If the flood control project is constructed, while it might not totally preclude the steelhead spawning runs, the area would not provide suitable habitat for a resident trout population due

to the elevated temperature and lack of bank vegetation. Page F-14 states the overall habitat quality could be improved after channelization. This is hard to believe if all bankside vegetation is removed, as a food source would be eliminated.

There are apparently also no plans to revegetate the berm that is part of the channelization plan, since the side of the berm would be riprapped (page F-12). This procedure would be just as aesthetically displeasing as the levee/floodwall system is stated to be (page F-15).

Disposal of the material removed from the stream during channelization is not discussed.

An alternative which has not been considered is the removal of only one bank, not both, during channelization. In this manner the habitat will not be altered so drastically and recovery time for the streams population would be reduced.

We also suggest that you contact the Division of Pure Waters in the New York State Department of Environmental Conservation (DEC) concerning a proposed Urban Runoff Study which is planned for the vicinity. The project is not yet funded, but you may wish to coordinate with DEC about proposed sampling locations and schedule.

We appreciate the opportunity to have examined the document and look forward to continuing coordination.

Sincerely yours,

Conrad Simon
Director
Water Division

Congress of the United States
House of Representatives
Washington, D.C. 20515

July 30, 1979

Lt. Col. Thomas R. Braun
Acting District Engineer
Corps of Engineers
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

RE: Irondequoit Creek Watershed

Dear Colonel Braun:

It was very kind of you to notify us of the meeting being held on August 15th concerning the above captioned subject.

I will attempt to have a member of my staff attend this meeting if at all possible but would appreciate any written documentation being made available after the gathering.

Most of this problem involves the Congressional Districts represented by Congressmen Conable and Horton, although a very small area of my district does become entangled with this flood problem.

Again thank you for bringing this matter to my attention.

With best wishes.

Sincerely,

Gary A. Lee

Gary A. Lee
Member of Congress

GAL/ajm

513 Cannon House Office Building
Washington, D. C. 20515

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
100 Grange Place
Room 202
Cortland, New York 13045

June 1, 1979

Colonel Daniel D. Ludwig
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

This concerns the proposed Irondequoit Creek flood control project. Investigations for improvement on Irondequoit Creek, New York and tributaries, including Allen Creek, were authorized in a resolution through the House of Representatives, Committee on Public Works. The authorization is contained in Section 208 of the Flood Control Act of 1965 (Public Law 89-298) adopted October 1965. These comments are provided to assist in your completion of the preliminary feasibility report and are not the comments of the Department of the Interior, as outlined in Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The U.S. Fish and Wildlife Service previously provided comments regarding the Buffalo District Draft Plan of Study in a planning aid letter dated February 9, 1977 and comments on the proposed scope of work for biological studies in a letter dated April 27, 1979.

Structural improvements have been proposed for Irondequoit Creek in the Panorama Plaza area, Town of Penfield, New York. The project as presently proposed involves a stretch of approximately 1 mile of the creek extending downstream from the Route 441 crossing to just south of the gravel quarry. Conceptual plans at this time include alternatives of either stream channelization or a floodwall and levee scheme. Actual dimensions and placement of the various structures have not been determined.

A recent site inspection indicates that despite the proximity of residential, commercial, and industrial development, there is substantial wildlife habitat along the creek within the project area. Riparian hardwoods and shrubs form, for the most part, a continuous band of vegetation along both sides of the creek and range from a narrow strip in some areas to wider bands extending up to 50 yards from the creek bank. A more extensive wooded area is located on the west bank where Penfield Road crosses the creek. Avian species observed utilizing the project area include mallard, mourning dove, grackle, and killdeer. These relatively undisturbed vegetated areas along the creek provide habitat for songbirds, small mammals, and other wildlife. Extensive, undeveloped wetlands exist downstream from the project area where the creek enters Irondequoit Bay.

DEC personnel in Avon, New York have indicated that valuable fisheries resources exist in Irondequoit Creek. Upper areas of the watershed are classified as trout waters and steelhead are stocked yearly. Rainbow trout are known to pass through the project area in spawning runs. Upstream from the project area a good population of stocked and wild brown trout exists and fishing pressure can be considered heavy. Sewage effluent is no longer discharged into Irondequoit Creek due to the Pure Waters sewage diversion program. Improvements in the water quality of degraded trout waters in the lower sections of the watershed are anticipated as a result of this program. With this improvement trout populations are expected to extend their ranges further downstream to include the project area.

Considering the rapid suburban development of the area in recent years, the existing riparian habitat becomes even more important as a valuable source of food and cover for fish and wildlife. Due to the projected improvements in water quality in the project area, both existing and future fisheries resources are important considerations.

Development and assessment of project alternatives should be directed toward selecting a plan which will provide effective flood control and at the same time preserve riparian vegetation, avoid possible adverse impacts to the downstream wetlands, and avoid degradation of or delay improvement in present water quality.

The effects of stream channelization are generally severe and long term. Probable impacts include loss of riparian habitat and disruption of benthic populations and aquatic vegetation resulting in loss of food and cover to fish and wildlife resources. Also, possible degradation of water quality within the project area and downstream can be associated with extensive disruption of bottom sediments. We would not support a channelization plan where an effective and less environmentally damaging alternative exists.

The levee/floodwall scheme could provide the required flood protection and with some modifications minimize the project related adverse impacts. Use of levees would avoid extensive streambed alterations and therefore lessen the possibility of decreased water quality and downstream impacts. The levees should be set back from the creek bank to preserve the riparian vegetation as much as possible. In sections where floodwalls must be used it becomes even more important to preserve the immediate streamside vegetation on the other bank. Plans to revegetate the levee structures should also be included to further reduce the loss of valuable riparian habitat. Vegetation of equivalent habitat value or a type which would allow for succession of native species should be utilized.

Biological studies of the project area are proposed for summer and fall 1979 and spring 1980. When data from these studies are available along with specific information on the proposed project designs further evaluation of the project alternatives will be possible.

Sediment analysis is not included in the studies at this time and is not crucial if channel alterations can be avoided. Should development of the alternatives indicate that channelization cannot be avoided, sediment quality and characteristics will be an important consideration and analysis should be performed.

We appreciate the opportunity to provide comments at this time and look forward to further coordination on the proposed Irondequoit Creek Flood Control Project.

Sincerely yours,

Paul P. Hamilton

Paul P. Hamilton
Field Supervisor

FRANK HORTON
U.S. REPRESENTATIVE
34TH DISTRICT OF NEW YORK

COMMITTEE:
GOVERNMENT OPERATIONS
RANKING MINORITY MEMBER
AD HOC COMMITTEE ON
ENERGY

WASHINGTON OFFICE:
2229 RAYBURN BUILDING
WASHINGTON, D.C. 20515
(202) 225-4916

Congress of the United States
House of Representatives
Washington, D.C. 20515

DISTRICT OFFICES:
314 FEDERAL BUILDING
ROCHESTER, NEW YORK 14614
(716) 263-6270

ARTHUR W. KELLY
SPECIAL ASSISTANT

DOLORES ROSE
FEDERAL LIAISON ASSISTANT

WAYNE COUNTY OFFICE BUILDING
LYONS, NEW YORK

January 19
1 9 7 9

Daniel D. Ludwig
Colonel, Corps of Engineers
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Col. Ludwig:

Some time has elapsed since my last correspondence from you concerning the reevaluation of flooding problems in the Village of Pittsford.

Your correspondence dated August 7, 1978 indicated that your schedule under the Irondequoit Creek study was to complete a preliminary report in November 1978 on the feasibility of alternative measures for flood management and allied purposes. I would appreciate receiving any further information that may be available from this report.

Thank you for your continued interest in this matter.

With kindest regards,

Sincerely,

Frank Horton

FH:mpkf

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
100 Grange Place
Room 202
Cortland, New York 13045

April 27, 1979

Colonel Daniel D. Ludwig
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

This is in response to Phil Berkeley's memo to Doug Ryan of my staff requesting our comments on the preliminary scope of work for the Irondequoit Creek biological studies. Due to manpower, and time constraints, we agreed earlier that the studies could be contracted out by the Corps of Engineers with the Fish and Wildlife Service providing input on the scope of work.

We have reviewed the preliminary scope of work and find it to be satisfactory for the most part, with the addition of the following considerations.

The frequency of sampling during each of the sampling seasons should be defined. In order to adequately assess fishery, avian, and mammalian resources, daily sampling and observations for at least one period of 3 to 4 days during each of the sampling seasons is needed.

Salmonid migrations are of considerable importance in Irondequoit Creek. An additional sampling period should be established during March-April 1980 to include the Rainbow trout spawning period and perhaps more intensive sampling should be carried out during the fall season to properly assess other salmonid migrations and spawning.

As part of the aquatic studies some day/night water quality sampling including dissolved oxygen, would be of value to determine the extent and significance of any diurnal fluctuations in water quality which may not be apparent from daytime aquatic fauna samples alone.

Since project plans may involve streambed alterations, sediment analysis should be performed. The effects that extensive disruption of the bottom material may have in the project area and downstream, relative to the sediment quality and characteristics, should be investigated as part of the biological studies.

DEC personnel in Avon, New York, indicated that the creek flows through the gravel quarry immediately downstream from the project area during spring high flow periods rather than following its usual course around it. Requests for stream bank repairs to correct this have been put off as it has been suggested that this occurrence provides flood protection for upstream areas. In evaluating the results of the biological studies within the project area, attention should be given to the significance of the flood control value and the biological impacts of this relative to the proposed project plans.

We appreciate the opportunity to provide comments at this time and look forward to further coordination on the proposed Irondequoit Creek Flood Control project.

Sincerely yours,

Paul P. Hamilton

Paul P. Hamilton
Field Supervisor

TOWN OF PENFIELD
3100 ATLANTIC AVENUE
PENFIELD, NEW YORK 14526

October 17, 1978

To: The Planning Board; The Town Board; Col. Dan Ludwig, U.S. Army Corps of Engineers

From: The Conservation Board

Re: Meeting With U.S. Army Corps of Engineers at Penfield Town Hall, September 26, 1978

The Conservation Board wishes to lend its support to developing and implementing a computerized land analysis technique as outlined by Col. Dan Ludwig and John Adams of the U.S. Army Corps of Engineers. Due to Col. Ludwig's efforts, the U.S. Congress has already authorized $300,000 for initiating this land analysis technique in the Irondequoit Creek Watershed (an area of 150 square miles). These monies cannot be used for any other purpose by communities in the watershed. If not taken advantage of soon, the opportunity to set up a computerized land use analysis system will be lost.

This computerized technique appears to be the most scientific, comprehensive system known to date which is applicable not only for land use planning but water quality planning as well. (A water quality program can later be added to a system originally set up for land use planning.)

Advantages of the land analysis computer system:

1. Each grid in the computer system covers one acre.
2. Data is taken from aerial photos.
3. The laser made maps are very sharp and clear - contours as small as 5 feet are recorded.
4. At least 17 different sets of information can be included in the data base, such as: soils map, presence of structures, drainage network, traffic zones, elevations, etc.
5. Criteria for any particular land use can be compiled - the computer will then show the areas suitable for that particular usage.
6. The probable effects on the immediate area of Irondequoit Creek from any particular development upstream in the watershed can be derived from the computer.

-over-

The computer would be an excellent way to scientifically check out the concerns the Conservation Board has had with the increased covering, either with paving or buildings, of large areas of land in the Irondequoit Creek watershed. The Conservation Board and the U.S. Army Corps of Engineers both feel that increased development upstream will drastically increase the flood hazard to Panorama Plaza.

As to the Corps' ideas on solving the flood problem in Panorama Plaza, the Conservation Board would not favor:

1. Large levees which would disturb large areas of the environment.

2. Diversion channels, again disturbing the environment and also creating areas of stagnant water.

3. Re-routing of Allen's Creek causing disturbance to the environment, plus destroying its attractiveness with straightened concrete lined channels.

4. Building check dams and reservoirs upstream from the Plaza. Dams have broken in the past. Reservoirs dug in the parks would destroy the purpose of the parks which are small. Penfield has worked hard to establish the Linear Park along Irondequoit Creek. Reservoirs would destroy this part and its beauty. Reservoirs are notorious for leaving muddy, unsightly banks at times of low water.

By the end of 1978, the Corps will complete a cost benefit analysis of building flood control structures for the Plaza. In my opinion, the cost benefit analysis should include the possibility of dismantling the Plaza and creating a park in the flood plain: (See the attached article from the Rochester "Times-Union"). Also applicabl is the following quote from the "National Parks and Conservation Magazine":

"An Alabama Department of Conservation report on five stream-channelization projects showed that in four of them the Federal Government could have purchased the entire flood plain at less than the construction costs, or could have invested these monies at 5 percent interest to more than repay the annual flood damage."

Respectfully submitted,

Elinor Osborn

Elinor Osborn
For The Conservation Board

EO/cs

Village of Pittsford
21 North Main Street
Pittsford, New York 14534
SETTLED 1789

September 15, 1978

Colonel Daniel D. Ludwig, PE
Department of The Army
U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

Representative Frank Horton provided us with a copy of your letter to him dated August 7, 1978. We are gratified to know that the problem of flooding in the Village will be considered as a part of the Irondequoit Creek watershed study which is about to be completed.

Would you please provide our office with a copy of the preliminary report that is due in November 1978. Your assistance in this matter is very much appreciated.

Sincerely,

David C. Shepherd

David C. Shepherd
Mayor
Village of Pittsford

DCS:jg

cc: Honorable Frank Horton

County of Monroe

NEW YORK

DEPARTMENT OF PLANNING
301 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

DON B. MARTIN, DIRECTOR

716 · 428-5461

September 5, 1978

Mr. Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineer
1776 Niagara Street
Buffalo, New York 14207

SUBJECT: Response to Corps of Engineers Letter Requesting Town Committments to Irondequoit Creek Watershed Modeling Program.

Dear Mr. Ludwig:

The Department of Planning has reviewed the Corps' Supplement to the Plan of Study which seeks to justify undertaking the use of computer modeling techniques in the Irondequoit Creek Watershed Study.

In a letter dated February 2, 1978, we supported the Corps' efforts to determine the potential for using a model to provide flood protection information and information on water quality as well. In March, 1978, a meeting was held in the town of Henrietta to discuss the model with watershed community representatives and others interested in flood protection and water quality in the creek's basin. It was noted at that meeting that the purpose of the model was to provide gross calculations regarding flooding problems for purposes of future land use planning, flood protection measures, etc. It was also noted that the model could be calibrated to provide more detailed information about smaller sections of the drainage basin and to provide data on water quality. Each calibration had some drawbacks and each calibration increased the cost of modeling. Our impression is that few people came away from that meeting with a clear understanding of the benefits and costs of each of the various ways in which the model could be used.

While we supported preliminary efforts to determine the feasibility of using a model in this study, before we could support the use of a model which presently seems to raise questions concerning its value, certain information should be gathered. That information is as follows:

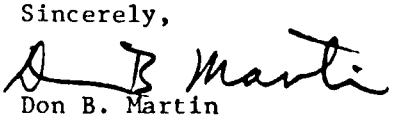
(1) Community Support Should be Obtained. The original purpose for studying the watershed was to help communities deal with flooding problems. Without community support, it is likely the program should be terminated. Town boards, etc. are the bodies that make decisions regarding community involvement in the program. The Corps should provide enough technical information about the model, its various calibrations and associated costs and benefits, etc., so that each community can determine whether they should support the use of the model.

(2) Use of the Model for Water Quality Study. It has been indicated at various meetings that the Corps' model could also be used to gather data on water quality for the eventual purpose of dealing with non-point sources of pollution in the watershed. The local 208 Water Quality Management Technical Advisory Committee feels that the model is not suitable for water quality sampling, etc., which they feel should be the first step taken in water quality planning in the creek's basin. The Committee has developed a proposal to obtain funds to study water quality in the Irondequoit Bay. Additionally, if the Corps model were to be used for this purpose, it is understood that to calibrate it for water quality planning work would require additional funds. The Committee feels that there are several adequate water quality models available that deal specifically with the topic they are concerned with. Regardless, it should be determined how this relates to the Corps' modeling efforts and data base, how this may affect work proposed by the Corps, coordination between the two efforts, etc. It is suggested that you contact John Davis, Deputy Director of Pure Waters (a.c.716) 428-5577, for further information on this matter.

(3) Progress on the Program. Assuming community support and coordination with the 208 Committee's efforts can be obtained, a schedule for progress on the program should be set out. To date, meetings have been infrequent. People begin to lose interest in the program. Community and other agency representation varies from meeting to meeting, resulting in a lack of cohesiveness in the program. It has not been precisely clear from the way information has been presented what the implications of various proposals are. There is no one person or group that is leading the program (however, your letter mentioned that you are anxious to establish such a group or committee and we feel that this is a step in the right direction). Additionally, prospective participants and their roles must be clearly defined. Meetings should be held more frequently, perhaps once a month. There should be a specific topic for each meeting and the committee should be able, at the end of the meetings, to give the Corps directions on the program.

The results of the information gathered on these points may well indicate that it is no longer feasible to pursue the use of the Oconee-type model as a tool for study flooding and water quality problems in the creek's watershed. If this turns out to be the case, it does not mean that the program should end or that it has to. We would urge that in any case, the Corps call a meeting of the communities in the watershed and discuss what services they would still provide under the program and what communities could expect in the way of output useful in dealing with flooding problems. Thus, there may still be some benefit to be gained from continuation of the program. We would encourage the Corps to pursue this last idea if the use of the model proves to be infeasible.

Sincerely,



Don B. Martin
Director of Planning

DBM:JL:vw

xc: Hon. Frank J. Horton, Congressman, 34th District
Lucien A. Morin, County Manager
John Davis, Deputy Director, Division of Pure Waters
G. Richard Sutherland, Associate Public Health Engineer, County Health Department
Richard Burton, County Health Department
Steven Murphy, County Environmental Management Council
Alan Taddiken, Center for Governmental Research, Inc.
John J. Coffee, Legislator, 9th Legislative District
Joanne D. VanZandt, Legislator, 10th Legislative District
Louise M. Slaughter, Legislator, 11th Legislative District
John Stanwix, Legislator, 12th Legislative District
Michael Ormsby, Legislator, 13th Legislative District
Eugene C. Mazzola, Jr., Legislator, 15th Legislative District
Pamela Hopeman, Chairperson, Monroe County Planning Board
George Gardner, Chairman, Monroe County Planning Council
Henry Williams, Chairman, Genesee Finger Lakes Regional Planning Council
Ned Holmes, Department of Environmental Conservation, Avon
John Stainton, Commissioner of Community Development, City of Rochester
Richard Wiles, Supervisor, Town of Brighton
John Kelly, Supervisor, Town of Henrietta
Roberta Barnes, Supervisor, Town of Mendon
Irene Gossin, Supervisor, Town of Penfield
Lake Edwards, Supervisor, Town of Perinton
Paul Spiegel, Supervisor, Town of Pittsford
Clement McGhan, Councilman, Town of Victor
Raymond Parrish, Supervisor, Town of West Bloomfield
Anthony Della Pietra, Mayor, Village of East Rochester
Peter McDonough, Mayor, Village of Fairport
David C. Shepherd, Mayor, Village of Pittsford
William Larsen

FRANK HORTON
U S REPRESENTATIVE
34TH DISTRICT OF NEW YORK

COMMITTEE
GOVERNMENT OPERATIONS
RANKING MINORITY MEMBER
AD HOC COMMITTEE ON
ENERGY

DAVID A. LOVENHEIM
ADMINISTRATIVE ASSISTANT

WASHINGTON OFFICE
2229 RAYBURN BUILDING
WASHINGTON, D.C. 20515
(202) 225-4916

Congress of the United States
House of Representatives
Washington, D.C. 20515

DISTRICT OFFICE
314 FEDERAL BUILDING
ROCHESTER, NEW YORK 14614
(716) 263-6270

ARTHUR W. KELLY
SPECIAL ASSISTANT

DOLORES ROSE
FEDERAL LIAISON ASSISTANT

WAYNE COUNTY OFFICE BUILDING
LYONS, NEW YORK

July 21
1 9 7 8

Col. Donald D. Ludwig
District Engineer
U. S. Army Engineer District
1776 Niagara Street
Buffalo, New York 14207

Dear Col. Ludwig:

I am in receipt of the enclosed correspondence from the Hon. David C. Shepherd, Mayor of the Village of Pittsford which is located in my Congressional District.

As you will note, the problem is not located only on Austin Park. The stream receives drainage from many properties in the town and state and county highway drainage systems.

I would sincerely appreciate a re-evaluation of this matter and a review of the problem on the basis of the entire stream.

Your courtesy and consideration on behalf of the residents of the Town and Village of Pittsford will be most welcomed.

With kindest regards,

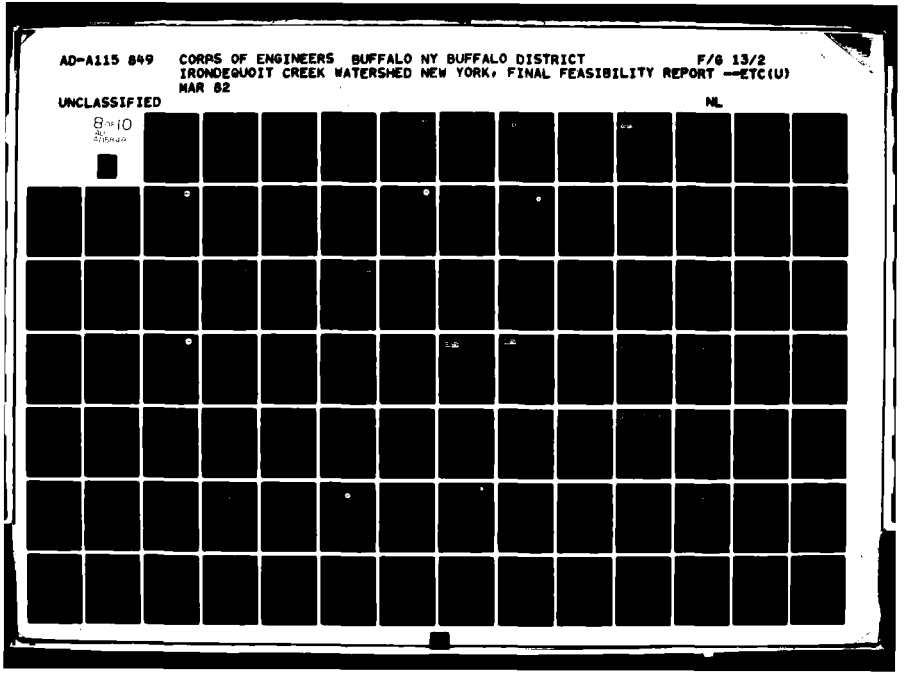
Sincerely,

Frank Horton

FH:drmpk
Enc.

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL



7/20/78

Organized 1796

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-2320

July 20, 1978

Thomas R. Braun
Lt. Col., Corps of Engineers
Deputy District Engineer
Dept. of the Army-Buffalo District
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Braun:

I am sorry for the delay in this matter, but I am now able to report positively to your letter of May 22, 1978. In the paragraph attached, please find a certified copy of the resolution of the Pittsford Town Board made on the 18th of July, 1978, committing us to promoting the information which will grow out of the Corp's study of the Irondequoit Creek. You will notice also that we have obligated the Town to contribute $1,000.00. Also, we are naming Timothy Downing as our official representative to the coordinating committee.

Please let us know as things develop.

Sincerely,

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

PMS:jsw

At a meeting of the Town Board of the Town of Pittsford, held at the Town Hall, in the Town of Pittsford, New York, on the 18th Day of July 1978.

PRESENT:

Paul M. Spiegel, Supervisor
Robert G. McAndrew, Councilperson
Richard W. Colgan, Councilperson
Robert C. McNamara, Councilperson
Carol K. Kaman, Councilperson

ABSENT: None

CORPS OF ENGINEERS STUDY OF IRONDEQUOIT CREEK [$1,000]:

A resolution was offered by Spiegel and seconded by McAndrew,

RESOLVED, that One Thousand Dollars [$1,000] be allocated for the use of the Corps of Engineers in their study of the Irondequoit Creek and that Timothy Downing be and hereby is appointed to a Coordinating Committee to utilize any information emanating from this study which would be advantageous to the Town of Pittsford.

ROLL CALL: Ayes : Robert G. McAndrew
Robert C. McNamara
Paul M. Spiegel

Nays : Carol K. Kaman
Richard W. Colgan

Declared carried.

****

STATE OF NEW YORK)
COUNTY OF MONROE) SS
TOWN OF PITTSFORD)

I GERALD G. ELLIOTT, Secretary of the Town Board of the Town of Pittsford, New York, do hereby certify that I have compared a copy of the resolution, as herein specified with the original in the minutes of the meeting of the Town Board of the Town of Pittsford, and that the same is a correct transcript thereof and of the whole of said original.

IN TESTIMONY WHEREOF I have hereunto set my hand this 21st day of JULY, 1978.

Gerald G. Elliott

Gerald G. Elliott, Secretary to the Town Board of the Town of Pittsford County of Monroe, State of New York.

Village of Pittsford
21 North Main Street
Pittsford, New York 14534
SETTLED 1788

July 14, 1978

Congressman Frank Horton
104 Federal Building
Rochester, New York 14614

Dear Frank:

I have been most pleased to participate with you recently in public events in the area of the Village of Pittsford. You have always been willing to take the time to "meet the public" on such occasions. You seem to have an endless store of energy and a warm way with your constituents.

From time to time, the Village of Pittsford has sought to enlist the aid of government at the Federal level and with rare exceptions we have not had our voice heard and/or responded to. The Village does have a growing flood danger problem which is far bigger than the Village's capacity to solve. We were given encouragement recently at one point by representatives of the Department of the Army Corp of Engineers. We attempted to follow up on that lead but apparently, once again, as in other projects, we are going to be turned down.

As you know, the Barge Canal winds through the Village of Pittsford and in the area of Austin Park thence on to the Village's westerly border, there is located a stream. This stream reflects upland drainage from developed and undeveloped properties in the town, a major Niagara Mohawk right-of-way and state and county controlled highway drainage systems. Over the years, this stream has continued to grow in both size and velocity and our major concern is the type of flood danger which would be generated or occur on a long-term or 25-50 year frequency basis.

I am enclosing herewith a copy of my letter as Mayor of the Village of Pittsford to Lt. Col. Thomas R. Braun, of the Army Corp of Engineers dated April 10, 1978, as well as a copy of Col. Daniel D. Ludwig's letter of April 27, 1978. In effect, Col. Ludwig has turned the problem back to the Village of Pittsford and our plea for a major study and flood protection program has been rejected.

Congressman Frank Horton (cont'd.)

I am writing to you because I know of your sincere interest in matters affecting the Village of Pittsford and other municipalities located in your district. Also, I am writing you because you have a reputation for getting things done. I am hoping that you will intercede on behalf of the Village of Pittsford (and surrounding areas involved in this flood danger area) to the end that the Army Corp of Engineers will re-evaluate their stand and come to our aid.

I am hoping that we will have an occasion to get together personally soon again.

Sincerely,

David C. Shepherd
Mayor
VILLAGE OF PITTSFORD

DCS:jg

Encs.

MONROE COUNTY
ENVIRONMENTAL
MANAGEMENT
COUNCIL

James K. Nolen, CHAIRMAN

July 13, 1978

Donald M. Liddell
Chief, Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

The Environmental Management Council staff has reviewed the Corps' proposed computer analysis of the Irondequoit Creek Watershed. It is a very ambitious project and would probably produce much valuable information. Although the project is now stymied, we feel it could be revised and offered again with a good chance for success.

There are several problems with the present approach that should be carefully considered in devising a new approach.

1. The model and its required data collection effort are very complex and expensive and will be applicable to only one watershed.

2. Local government officials and the general public have misunderstood the value of the proposed basin-wide study effort. They have come to believe that because very few large-scale developments take place there is little value in a large-scale model.

3. Roles for the various participants have not been clearly defined or, as in the case of the County, have been ignored altogether.

4. The water quality segment of the model is a weak link and its output could not be used confidently.

These problems correspond to several general needs that should be considered in developing a new approach.

1. Reasonably accurate water quantity models are needed that a. are general enough or flexible enough (easily modified) to be used in other watersheds in the County and b. are as simple as possible (given the accuracy constraints) to minimize the effort and expense of data collection.

2. A two (or more) leveled approach is needed for assessing effects and selecting control measures. First, there should be a basin-wide model to assess large-scale changes such as land use plans and large proposed developments. This assessment would be used to select major non-structural and structural control measures. Second, there should be appropriate models for assessing small-scale changes such as most developments. These would be used to select control measures for individual projects and they should insure consistency of individual controls with overall measures.

3. All potentially important participants need to be identified and brought together and agreement must be reached on their various roles. A single coordinator should be selected and each role should be fairly clear.

4. Issues other than water quantity, such as, water quality, erosion, and sedimentation, need to be considered and every attempt should be made to coordinate efforts for comprehensive treatment of these related issues.

The Corps certainly cannot be expected to satisfy all of these needs, but it has a crucial role to play. Related efforts are underway that with proper coordination could help to more completely satisfy local needs. EMC has a Drainage Committee with broad representation studying these issues that would be glad to cooperate with the Corps and that would greatly appreciate the Corps input. There is also a 208 Planning Group that would cooperate on water quality aspects.

We would be glad to discuss these ideas with you if you feel this would be helpful.

Sincerely,

Jane Schmidt

Jane Schmidt, Chairperson
EMC Drainage Committee

jnb

cc: Don Martin, Director
Dept. of Planning

LOZIER
ARCHITECTS ENGINEERS
50 CHESTNUT PLAZA · ROCHESTER, NEW YORK 14604 · 716-454-5630

6/28/78

WAYNE P ACKART
LEONARD E BOWER
LEROY W BROWN
ROBERT W BUTLER
JAMES C DUNLAP
EARL F GEER
TIMOTHY K HAMPTON
EDWIN L KUMMER
SALVATORE A LoBELLA
RODERIC F LELAND
JOSEPH C LU
ROBERT C PLECASH
RICHARD S RANDALL
EDWARD M SHAPIRO
WILLARD H STEANE

1500-00
June 28, 1978

Colonel Daniel D. Ludwig
U. S. Army Engineer District, Buffalo
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Re: Corps' Irondequoit Creek Water Shed Study

Dear Colonel:

Normally, as a consultant, I refrain from publicly commenting on a project for which I am not directly involved. In this instance however, because of my indirect involvement as a member of the Environment Management Council's Drainage Committee I feel such action on my part is acceptable.

The Corps and its Consultant have worked quite hard and have done an excellent job in formulating the proposed study. There seems however, to be a lack of visible local support. I feel that this lack of support originates from three directions:

1: A lack of functional coordination between the local agencies in informing the Corps of exactly what is uniformly desired; there are too many interested jurisdictions; of which none are apparently functioning in a coordinating or clearinghouse capacity;

2: The existance of other related study efforts such as the proposed 208 study; and

3: A desire by some of the local jurisdictions to have the Corps produce the study in a manner such that the effects of relatively minor land changes can be immediately assessed. An aspect beyond the scope of the proposed study.

In my discussions with interested parties though, I do recognize a desire for the Corps' assistance. This desire however, is not actively nor openly expressed, I feel, because the parties are not fully appreciative of the benefits accruing from a study of the type proposed. Perhaps several additional meetings, on a workshop rather than a presentation basis, can establish a better understanding of the study goals and benefits. The additional time for these meetings will also allow the various local jurisdictions to be more in concert with each other.

Very truly yours,

Howard M. Shapiro

Howard M. Shapiro

HMS/mo

TOWN OF PENFIELD • 3100 Atlantic Ave.
Penfield, N.Y. 14526

IRENE L. GOSSIN, Supervisor

June 21, 1978

Thomas R. Braun
Lt Col, Corps of Engineers
Deputy District Engineer
Dept of the Army
1776 Niagara Street
Buffalo, N. Y. 14207

RE: Irondequoit Creek Model

Dear Mr. Braun:

In reply to your letter of May 22, 1978, please find attached a certified resolution assuring the Corps of Engineers of the following:

1. The commitment of the Town of Penfield to the use of information to be made available provided by such a model.

2. Obligating the Town to contribute $1,000 by Jan. 1979 to cover local costs of the model operation from 1979 to 1984.

3. Naming of myself, as Supervisor, to a coordinating committee. Councilman Donald Milton is named as alternate.

It is our hope that the coordinating committee will be convened at an early date. Should a meeting place be required, we are happy to offer our Town Hall.

Yours truly,

Irene L. Gossin

Irene L. Gossin, Supervisor

ILG:bf
Enc.
cc: Frank J. Horton, Congressman
Lucien A. Morin, County Manager
Don Martin, Co. Dept of Planning
Supervisor, Towns of Pittsford, Victor, Mendon, W. Bloomfield, Macedon, Brighton, Henrietta
Chairman, Ontario Co. Bd. of Supervisors
Mayors of E. Rochester, Fairport, Pittsford, Honeoye Falls
D. Milton, Councilman Town of Penfield

BY: Supervisor Irene L. Gossin — Penfield Town Board

RESOLUTION NO. 361 OF 1978 (6/19/78) — Public Works Comm.

NAME: Assurance to Corps of Engineers re: Irondequoit Creek Flood Study

WHEREAS, the Corps of Engineers was authorized by the Congress to survey the Irondequoit Creek Watershed for flood control and allied purposes, and

WHEREAS, the Irondequoit Creek Watershed is undergoing rapid suburban development, and

WHEREAS, the Town of Penfield, at the lower reaches of the Watershed, has already suffered extensive flood damage and with continuing upstream development it is imperative that such development be carefully controlled, lest the Town be placed in a catastrophic situation, and

WHEREAS, Control of upstream land use resides primarily in the hands of local government, and

WHEREAS, small local governments often lack sufficient data and expertise to exact high development standards, and

WHEREAS, the Corps has recommended that a Supplement to the Irondequoit Creek Plan of Study be approved, such Supplement to be estimated at $250,000 - $300,000, to consist of a detailed model which could predict changes in flood heights, flood damages and certain environmental indicators, and

WHEREAS, the Corps recommendation has been arrived at after positive responses obtained during a number of meetings with State, County and local officials,

NOW, THEREFORE, BE IT RESOLVED that the Town of Penfield assures the Corps of Engineers of its sincere desire to urge the approval of the Supplement to the Plan of Study and also assures the Corps that the Town of Penfield will use the model, and

BE IT FURTHER RESOLVED that the Town of Penfield agrees to meet the local cost of approximately $1000 for the entire period of 1979-1984, such cost to include coordination, mapping and interpretation of results, and

BE IT EVEN FURTHER RESOLVED that Supervisor Irene L. Gossin be appointed to sit on the Coordinating Committee and that an alternate to the Committee be Donald Milton.

Moved by: Supervisor Gossin

Seconded by: Board Member Bundschuh

Vote:		
	Bundschuh	Aye
	Gossin	"
	Milton	"
	Nielsen	"
	Philbrick	"

I have compared the preceding with the original thereof, on file in this office, and do hereby certify that the same is a correct transcript therefrom and of the whole of said original.

Nancy Gunther, Town Clerk
Town of Penfield

Dated: June 20, 1978

RICHARD D. WILES
Supervisor

Town Of Brighton
MONROE COUNTY, NEW YORK
2300 ELMWOOD AVENUE / ROCHESTER, NEW YORK 14618 / 473-8800

June 15, 1978

Lt. Col. Thomas R. Braun
Department of the Army
Buffalo Dist., Corps of Engineers
1776 Niagara St.
Buffalo, N. Y. 14207

Dear Lt. Col. Braun:

In reference to your letter of May 22, 1978 concerning a watershed model for Irondequoit Creek, our Town Board, at its June 14, 1978 meeting unanimously endorsed this program and will provide $1,000 as our local fund contribution.

We are hoping that a Watershed Committee will be approved by all towns in this area and we will appoint a member to this committee and will pay for our share at the time of the committees formation.

Sincerely,

TOWN OF BRIGHTON

Richard D. Wiles
Supervisor

RDW:ps

Organized 1796

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-8649

June 14, 1978

Colonel Daniel D. Ludwig
Buffalo District
The Corps. of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

The Town Board of Pittsford and its staff had further conversations in regard to the proposed study of the Irondequoit Valley.

It is our considered opinion that an Oconee study is the ultimate and would be the very best type of study.

We are given pause, however, by the expenditures which would initially be necessary and we are given further pause by the realization that continued expenditures would be needed to keep the study up to date as development occurred.

We have given further thought, also, to the realization that the effectiveness of such a study is dependent upon the inter-municipal cooperation in the future of the various Town governments and of various developers and even of Court decisions pertaining to zoning. The problems attending the effective utilization of all the virtues of an Oconee study lead us to believe that it would be possible to lose all of the benefits if everything did not work well in the political or social fields in the future.

We have also given thought to the feeling that the number of flooding problems of the Irondequoit are some-what limited as compared to many other streams; that is, they are well defined. The methods of handling or controlling or alleviating these problems, we feel, is well within the scope of the ability and experience of the Corps of Engineers without Oconee study.

Therefore, may we make a recommendation to you that you give up the Oconee study and try to proceed with the study of the creek on a problem and response method using known and accepted methods.

Please be assured of the continuing interest of the Town of Pittsford and our willingness to cooperate.

Sincerely,

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

PMS/bh

cc: John McCarthy
Irene Gossin
Lake Edwards
Douglas Fisher
Roberta Barnes
Jack Kelly
Bill Larsen

Town of Perinton

31 SOUTH MAIN STREET • FAIRPORT, N.Y. 14450 • PHONE 223-0770

June 13, 1 9 7 8

Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara St.
Buffalo, N. Y. 14207

Dear Sirs:

This refers to letter of May 22, File NCBED-PN from Lt. Col. Thomas R. Braun suggesting that the Town of Perinton consider a commitment of $1,000 to cover local costs toward an Oconee-type study of the Irondequoit Creek Watershed.

The Town Council resolved at its regular meeting June 8, 1978 to refrain from making this commitment, believing that the problem has received adequate study.

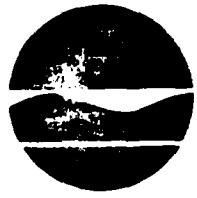
Sincerely,

Lake B. Edwards
SUPERVISOR
Town of Perinton

cc -

WCL
RAB

New York State Department of Environmental Conservation
P. O. Box 57, Avon, New York 14414
Telephone: 716-226-2466



Peter A. A. Berle,
Commissioner

Irwin H. King
Regional Director

April 11, 1978

Lieutenant Colonel Thomas R. Braun
Deputy District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Braun:

Re: Irondequoit Creek Study
Corps Reference -- NCBED-PN
Monroe County

This is in reply to your letter of March 27, 1978, to Thomas P. Eichler at our Albany office.

As you know, I have met with John McCarthy of your staff and also with your consultants to assist in the data gathering effort. We have arranged a meeting on April 12 with Division of Pure Waters' Survey and Analysis staff from Albany and Monroe County technical staff to further define water quality work we will recommend to the Corps.

Following our meeting we plan to meet with John McCarthy next week to further explore model possibilities. Once this information is in hand we feel we can propose specific water quality objectives and procedures for obtaining those objectives with realistic costs and an identification of source of funds. I believe this is the specific type of request that the Corps requires. Section 208, PL 92-500 funds will be available for the initial program.

We agree that the model, once developed, must be maintained and used to be of value. 208 is not intended to fund ongoing programs. After definition of model capabilities, we will make a specific

proposal regarding the agency to maintain and operate the model. My initial suggestion at this time would be to recommend the Monroe County Department of Planning as that agency; however, computer run capability might require other arrangements.

Regarding the technical options available, we would recommend use of the 1.15 acre grid as noted above. We will propose specific environmental indicators after review by our Division of Pure Waters Albany staff.

As noted in Mr. Eichler's letter to you of April 6, 1978, I have been asked to assume responsibility for DEC involvement in this project. Accordingly, I will now be the primary contact within DEC for this Irondequoit Creek project. Other DEC staff will continue to be your primary contacts for other Corps activities.

We look forward to working with the Corps of Engineers, Monroe County, Ontario County, and townships in the Irondequoit Creek Basin on this project.

Very truly yours,

Paul F. Schmied, P.E.

Paul F. Schmied, P.E.
Regional Water Quality Engineer

PFS:crd

cc: Thomas P. Eichler, Director, Resources Program Development Subdivision, NYSDEC, Albany
Don Martin, Monroe County Department of Planning
G. Richard Sutherland, Monroe County Department of Health
Joseph Carver, Ontario County Environmental Management Council

April 10, 1978

Thomas R. Braun, Lt. Col.
Department of the Army
Buffalo District, Corp of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Braun:

In my letter of March 17, 1978, I referred to the Austin Park area west of Boughton Avenue as being severely eroded. This erosion, nevertheless, is only a portion of the overall problem. This is the area where the stream that goes through the Village reaches a maximum velocity just before entering the canal.

The area of our concern is by no means restricted to the Austin Park road. This stream enters the Village on its westerly border and goes through the Village to the canal. It crosses a state highway, county road and involves several private property locations, not to mention a portion of property owned by the State of New York adjacent to the canal itself.

Our problem is that the source of water is primarily from outside the Village, and therefore, out of our direct control. The amount of water is being picked up to the west of the Village through subdivisions and storm water sewer systems, not to mention the accumulation of water by state highway and county highway in the Village of Pittsford all contributing to make this a growing problem.

We are not concerned with the day to day problem but are looking toward a real flood danger problem which would probably occur on a 25-50 year frequently basis. It is this real holocaust

Thomas R. Braun, Lt. Col.

that we want to avoid and that's why we were particularly interested in having the Corp of Engineers work with us on a project that is far too big for our budget, not to mention our personnel. I am hoping that with a broader view of the problem, you will reconsider the position taken in your letter of March 27, 1978. Your help in this matter is very urgently needed.

Very truly yours,

David C. Shepherd
Mayor
Village of Pittsford

DCS:jg

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Peter A. A. Berle,
Commissioner

April 6, 1978

Colonel Thomas R. Braun
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Braun:

This is in reply to your letter of March 27 concerning the modeling being done at Irondequoit Creek.

Paul Schmeid of the Department's Region 8 office in Avon has been asked to assume responsibility for the Department's involvement in this very promising project. This will assure effective coordination within DEC as well as with local interests.

I have referred your letter to Mr. Schmeid for a direct reply.

Sincerely,

Thomas P. Eichler
Director, Resources Program
Development Subdivision

cc: Mr. Schmeid

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-8649

April 3, 1978

Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineer
Department of The Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig,

I had a fellow by the name of Mike Barrett walk into my office last week. He lives down on Forestwood Lane which is very close to the Irondequoit Valley immediately north of the canal here in Pittsford.

Mike brought to my attention the fact that the Irondequoit Creek, as it jets out from under the canal is doing a great deal of erosion of the banks of the east side.

He pointed out that some of the telephone poles are down and the whole thing seems aimed in the direction which will ultimately remove the backyards of a number of homes and, ultimately again, reach some of the homes.

Here is another small illustration of the need to control the increasing power and the high temporary volume of the creek.

I wish to reiterate our position that we are interested in your study and ask you to proceed with it.

Sincerely,

Paul M. Spiegel

PMS/b

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

New York State Department of Environmental Conservation
P.O. Box 57, Avon, New York 14414

Peter A. A. Berle,
Commissioner

Irwin H. King
Regional Director

February 9, 1978

Colonel Daniel D. Ludwig
Buffalo District Engineer
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

Re: NCBED - PN
Irondequoit Creek Watershed Study

This is further to the letters to you dated January 19, 1978, from Regional Director King and from Mr. Eichler in our Albany office.

I believe Mr. Eichler's letter is more pessimistic than necessary as the individual drafting it may have been unaware of recent federal legislation authorizing funding for Section 208 of the Federal Water Pollution Control Act. While we have not received detailed guidance regarding allotments and release of these funds, the law does authorize increased funding for fiscal years ending September 30, 1978, 1979, and 1980.

It was my understanding from Mr. McCarthy of your staff that the Corps was not contemplating large expenditures on this study until at least late 1978 or later.

Further, Mr. Eichler's letter is accurate that we cannot transfer funds directly to the Department of the Army. We certainly have no intention of building our own Oconee computer model and purchasing the necessary computer hardware to run it. We are very interested in working in close cooperation with your staff and may be able to hire staff specifically for the Irondequoit Creek Study when detailed procedure for implementing the recent law are promulgated.

Unfortunately, some confusion will continue until our State-EPA agreement and the procedures for implementing the recent law become effective.

Very truly yours,

Paul F. Schmied, P.E.

Paul F. Schmied, P.E.
Regional Water Quality Engineer

PFS:anp
cc: Mr. Eichler
Mr. O'Toole
Mr. Karath
Mr. Holmes
Mr. Wagner
Mr. Mt. Pleasant

County of Monroe
NEW YORK

ymond E. Keefe, P.E.
tor of Public Works and
erintendent of Highways

350 E. Henrietta Road
Rochester, New York 14620
Telephone: 461-3160

February 9, 1978

Mrs. Irene L. Gossin, Supervisor
Town of Penfield
[illegible] Atlantic Avenue
Penfield, New York 14526

Re: Irondequoit Creek Pipe Structure Behind Panorama Plaza

Dear Supervisor Gossin:

In your February 28, 1977 reply to my earlier letter regarding subject, you posed a number of questions that you thought would be answered by the Corps of Engineers as they develop their facilities plan to cope with flooding along Irondequoit Creek.

I don't know whether the Corps of Engineer's study has provided you with answers to your questions, but with the present snow accumulation in the watershed for Irondequoit Creek, we may certainly expect to have high water in that creek this spring. This could create problems with ice or debris floating to that structure, with the resulting obstruction forcing the water to spill over the banks upstream from the structure, as your are well aware.

Even though you did not ask my comment on your questions, I do belatedly offer the following:

The structure was evidently installed by the developer of the area on the south side of the Creek before Panorama Trail West was built (Emil Muller?). Mr. Lusk, of your staff, confirms that there is a sewer main and possibly a water line carried across this structure, both of which would have to be relocated, should the structure be removed.

The development of these lands was approved by the Town with some form of agreement, I must assume, between the Town and developer regarding the structure. If the structure was dedicated to the Town, then it would be yours to remove (unless the agreement stated otherwise); if the structure is still privately owned, then its removal would be the owner's responsibility.

Due to the fact that this structure mainly serves private interests, I would doubt that the voters would approve of a bond issue to pay for its removal. Its removal, however, is something that your people could accomplish, if they had to.

During the next few weeks I would suggest that your people keep close track of this structure to make sure that any debris that does accumulate at its upstream face is immediately removed. Also, during times of rapid runoff, it will again be important to continually check the structure.

Very truly yours,

Raymond E. Keefe
Director of Public Works

REK:RLF:av
cc: Mr. Morin
Corps. of Engineers, Buffalo Dist.

TOWN of HENRIETTA

475 CALKINS ROAD • HENRIETTA, NEW YORK 14467 • TELEPHONE 334-7700

JOHN E. KELLY
Supervisor

DAVID H. MAILLIE
Deputy Supervisor

GARY A. KLEIN
MICHAEL MURPHY
CARL R. HEITMAN
...nen

February 8, 1978

Daniel D. Ludwig, Colonel
Buffalo District Corps of Engineers
United States Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Re: Plan of Improvement - Genesee River Basin -
Red Creek - Monroe County, New York

Dear Colonel Ludwig:

Several weeks ago we met with your representatives concerning the Irondequoit Creek Study. At that time it was suggested by John McCarthy of the Corps that it may be possible to reactivate the referenced flood control project.

The officials of the Towns involved (Brighton and Henrietta) have recently met to discuss possible implementation of the project and have expressed a mutual desire for such action. We are requesting that you inform us as to the present status of the project as well as how to go about reactivating the same.

Thank you for your consideration in this matter.

Very truly yours,

Henry K. Corneles

Henry K. Corneles, P.E.
Town Engineer

xc: J. Kelly, Supervisor, Henrietta
R. Wiles, Supervisor, Brighton
J. Burchill
File

County of Monroe

NEW YORK

DEPARTMENT OF PLANNING
301 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

DON B. MARTIN, DIRECTOR

TELEPHONE:
(716) 428-5461

February 2, 1978

Mr. Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineer
1776 Niagara Street
Buffalo, New York 14207

Subject: Use of computer model and steering committee for Irondequoit Creek Watershed study.

Dear Mr. Ludwig:

In your letter of December 22, 1977, you requested our opinion on two matters. The first was whether we felt the Corps should begin to gather data to determine whether a computer model could be used in the Irondequoit Creek Watershed as a water quality and floodplain management tool. Secondly, you asked what we felt the make-up of a committee should be that would represent all of the interests in the watershed study, and whether we would like to be a member of such a committee.

In responding to the first question, according to information presented at the last meeting on the watershed study, data in our letter of December 22, and the attached preface to it concerning the use of a computer model in a previous study, the model could evaluate the effects of future land uses, both in and outside the floodplain, in terms of their effects on the drainage and flooding characteristics in the watershed. Additionally, representatives of both the Monroe County Health Department and the State's Department of Environmental Conservation indicated at the last watershed study meeting that they feel the model can be calibrated to evaluate information on 208 water quality management program related aspects such as use of various chemicals in the environment, agricultural practices, sedimentation and erosion etc. Thus, it appears that a model could be a very effective tool in identifying and analyzing data and problems in the watershed, providing meaningful information quickly to those who must ultimately make the decisions on land uses, and use practices, etc. We understand that the model is an expensive tool. However, we also realize that there is a good possibility that, through more conventional methods of analysis, communities might not be able to assess the implications of different actions in the watershed prior to their occurrence as accurately and quickly as the model could. In some cases, through the use of conventional analytical methods the full impact of a development might not be known until after the development is a fact. Therefore, we support your efforts to collect data to determine if the model is feasible for use in the Irondequoit Creek Watershed.

Regarding the make-up of the committee to represent the various interests in the watershed, first, it should contain a representative from each of the governmental units in the watershed since they have the primary responsibility for land use and a concern for flooding. Then, there are those who have an interest in the project as it relates to the 208 water quality management program objectives. The interests of those concerned with 208 are primarily technical and would not appear to conflict with those of the various units of government. Thus, the latter group could be either part of the committee make up of governmental representatives or they could meet separately with the Corps, concentrating on the technical aspects of water sampling, non-point sources of pollution, etc. If separate groups are created, there should be periodic meetings at which the progress in both areas is covered so that each group is kept up to date on the overall progress of the program. Other agencies and government officials, such as city councilmen, county and state legislators should also be kept informed regarding the progress of the study. Since the Monroe County Planning Department has an interest in both areas and has been involved in both the 208 program and the Irondequoit Creek Study, we would like to continue to be represented in both areas.

Looking ahead a bit, one of the products of the study may well be recommendations on land use practices, conservation measures, etc. that should be implemented in certain situations. It will be imperative that these measures be implemented for the benefit of all the interests in the watershed. To this end, it might require that a body be established that would have the authority to require compliance with certain practices, regardless of location in the watershed. Although the study is a long way from being completed, it is suggested that some thought could be given to this concept now and if it is felt that it is worthwhile pursuing, the subject could be discussed with the governmental units in the watershed. All of them so far have indicated a desire to control flooding and they may be willing to consider the establishement of such an authority that would see that certain flood control and other water quality related measures are complied with at the local level along with the local communities' standard land use regulations.

Finally, your letter requested that if we have access to various types of data that we provide samples of it to assist you in evaluating the applicability of using the computer model in the Irondequoit Creek Watershed. We discussed this general subject with John McCarthy of your office several weeks ago, and on December 22, 1977, sent a letter to Mr. Donald Clondys of McPhee, Smith, Rosenstein Engineers, consultants to the Corps on the project, outlining all of the various types of information we have in our office that would be available to help in determining the feasibility of using a model in the Irondequoit Creek Watershed study. Thus, I will not elaborate on these items any further here in this letter. However, I do wish to bring to your attention, two additional data sources that were briefly discussed with John McCarthy and your consultant. They are the Community Analysis Model (CAM) and the Geographic Base File/Dual Independent Map Encoding (GBF/DIME) system of the U. S. Census Bureau. The CAM is a simulation model that can predict changes in "neighborhoods" (areas defined by their socio-economic characteristics), based on data on such items as housing, governmental actions, population, etc. The GBF/DIME contains information by street address and this data (and any other data file based on the street address) can be aggregated up to the CAM "neighborhood" level. More information can be obtained on the two systems for the Rochester Region

by contacting: Center for Governmental Research
37 South Washington Street
Rochester, New York 14608
(a.c. 716) 325-6360

Please feel free to contact John Lamb of my staff at (a.c. 717) 428-5468, should you or your consultant have need for any further data, or if you have any questions on these comments.

Sincerely,

Don B. Martin
Director of Planning

DBM:JL/cm
xc: Hon. Frank J. Horton, Congressmen, 34th District
Lucien A. Morin, County Manager
John J. Coffee, Legislator, 9th Legislative District
Joanne D. VanZandt, Legislator, 10th Legislative District
Louise M. Slaughter, Legislator, 11th Legislative District
John Stanwix, Legislator, 12th Legislative District
Michael Ormsby, Legislator, 13th Legislative District
Eugene C. Mazzola, Jr., Legislator, 15th Legislative District
Pamela Hopeman, Chairperson, Monroe County Planning Board
George Gardner, Chairman, Monroe County Planning Council
Henry Williams, Chairman, Genesee Finger Lakes Regional Planning Council
Ned Holmes, Department of Environmental Conservation, Avon
John Stainton, Commissioner of Community Development, City of Rochester
Richard Wiles, Supervisor, Town of Brighton
John Kelly, Supervisor, Town of Henrietta
Roberta Barnes, Supervisor, Town of Mendon
Irene Gossin, Supervisor, Town of Penfield
Lake Edwards, Supervisor, Town of Perinton
Paul Spiegel, Supervisor, Town of Pittsford
Clement McGhan, Councilman, Town of Victor
Raymond Parrish, Supervisor, Town of West Bloomfield
Anthony Della Pietra, Mayor, Village of East Rochester
Peter McDonough, Mayor, Village of Fairport
David C. Shepherd, Mayor, Village of Pittsford
William Larsen

PITTSFORD ENVIRONMENTAL BOARD

Town of Pittsford

Pittsford, New York 14534

January 28, 1978

Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineer
1776 Niagra Street
Buffalo, New York 14207

Dear Colonel Ludwig,

The Pittsford Environmental Board has been asked to comment on a letter from the Corps of Engineers concerning a proposed Oconee type study for Irondequoit Creek. Basically, the Corps is seeking an expression of approval or disapproval for undertaking this study, soliciting such expression from units of local government. We respond as follows:

The Town of Pittsford occupies the central portion of the main-stream watershed of the Irondequoit drainage system. The Town therefore recognizes that it plays a predominant role in potentially affecting stream flow conditions downstream and concurrently being affected by potential stream flow conditions from further upstream. It behooves our Town government, therefore, to become aware of problems that could be created by watershed mismanagement, and we recognize that an Oconee type study is such a watershed management tool.

However, the Town also recognizes that, aside from the existing commercial real estate development in the Penfield Flats, proper zoning and floodplain management in the past along the Valley has fairly well prohibited flood-prone situations. Further, guidelines now adopted in the four towns along the mainstream Valley to control peak rates of runoff, as well as to control and contain the products of erosion, cause a very real question to be raised as to the necessity of this expensive and prolonged study.

The Environmental Board's position is to request the Corps of Engineers to refrain from making any such decision concerning the implementation of an Oconee type study until such time as a comprehensive inventory of all Valley regulations, potential damage areas, present physical condition of the Creek, and past studies have been completed, inventoried, and publicly discussed with interested citizens in the Valley. An informed, intelligent

PITTSFORD ENVIRONMENTAL BOARD

Town of Pittsford

Pittsford, New York 14534

decision can them be made jointly be the Corps, local citizens and officials. Such a study/inventory should be undertaken forthwith and a target date established for public discussion for late spring, 1978.

The Pittsford Environmental Board will cooperate with the Corps and its agents in undertaking this very necessary inventory and analysis.

Very truly yours,

Jane M. Arseneau

Mrs. Jane M. Arseneau
Chairman

KC: Mr. Paul Spiegel
Supervisor
Town of Pittsford

DIVISION OF HUMAN AFFAIRS

COUNTY OF ONTARIO

DEPARTMENT OF PLANNING

ROBERT M. BARROWS
DIRECTOR OF PLANNING

PLANNING BOARD

ENVIRONMENTAL MANAGEMENT COUNCIL

January 20, 1978

Colonel Daniel D. Ludwig
District Engineer
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

This is in response to your letter dated December 22, 1977 concerning the Corps study of Irondequoit Creek. I strongly endorse the Corps' proposal to develop a HEC model for the Irondequoit Watershed to assist in flood plain management and water quality planning. I am of the opinion that any committee formed to represent the various municipalities concerned in the Irondequoit Creek study should include members of the governing, planning, and environmental bodies. In the instance of Ontario County this would involve representatives of the Board of Supervisors, County Planning Board, and Environmental Management Council. The Ontario County Planning Board has concurred in these recommendations.

In response to your request for available information, we would have in our office a great deal of the items mentioned, including: existing land use information, tax maps; aerial photography (1971 & 1972); flood plain maps (F.I.A.); environmental maps (Town of Victor); resource protection, and topographic inventories (Town of Victor); legislation, ordinances, and policies; generalized future land use plan (County basis); etc. Much of the above mentioned information will require xeroxing or other forms of duplication and I would therefore, request that your staff visit our office to determine which items might be useful.

Following is a listing of potential contact agencies:

Ontario County Board of Supervisors
John T. Hicks, Chairman
County Court House
120 North Main Street
Canandaigua, N.Y. 14424

Town of Victor
Conservation Advisory Council
Bruce VanDerwater, Chairman
Town Hall
Victor, N.Y. 14564

Ontario County Planning Board
(new Chairman to be appointed)
120 North Main Street
Canandaigua, N.Y. 14424

Ontario County Environmental Mgmt. Council
Alan Palmer, Chairman
120 North Main Street
Canandaigua, N.Y.

Town of Victor
Douglas Fisher, Supervisor
Town Hall
Victor, N.Y. 14564

Town of Victor Planning Bd.
Harold Ryan, Chairman
1252 Cork Rd.
Victor, N.Y. 14564

Town of West Bloomfield
Raymond Parrish, Supervisor
R.D.#2
Holcomb, N.Y. 14469

Town of West Bloomfield Planning Bd.
Howard Chapple, Chairman
1924 County Rd. #38
Ionia, New York 14475

Town of West Bloomfield
Conservation Advisory Council
% Michael Corrigan
9040 Routes 5 & 20
West Bloomfield, N.Y. 14585

Do not hesitate to contact me if I can be of any further assistance.

Sincerely,

Robert M Barrows

Robert M. Barrows, Director
Ontario County Department of Planning

RMB:hep

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Peter A. A. Berle,
Commissioner

January 19, 1978

Colonel Daniel D. Ludwig
District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

I am writing to reiterate and emphasize our strong interest in an Oconee-type study by the Buffalo District, Corps of Engineers in the recently funded Irondequoit Creek study in New York.

We believe a comprehensive, systematic determination and evaluation of alternative land use patterns in the Irondequoit Creek basin is essential for sound water and related land resources management, particularly to achieve water quality management and flood damage reduction objectives.

The Irondequoit Creek basin in Monroe County has experienced steady growth over the last few years. Suburbanization of the watershed has been accompanied by increased runoff and increased pollution into the Irondequoit Creek and its tributaries. Water quality and flood problems have been exacerbated.

On the water quality problems, prior studies have shown that land use related non-point sources of pollution are significant in the basin and that a non-point source management plan may be necessary to meet water quality objectives. The population growth has resulted in increased pollutants in the form of sediments, nutrients, organic matter, fertilizer, salt, oil, grease, and heavy metals. Increased sediment has resulted from land erosion on the development and construction sites. A variety of pollutants result from general runoff from roads, parking lots, and residences. Organic matter and nutrients are contributed by individual septic systems in many residential areas in the watershed. Further information is needed to define these sources and their severity in the residential, rural and agricultural areas. Information on the effect of alternative future land use patterns is essential. The techniques that have been developed for storm water quality modelling, land erosion analysis, and instream water quality modelling for an Oconee-type study would directly meet our needs in the basin. In addition, the work should be useful as a pilot effort

for our statewide Section 208, PL 92-500, responsibilities for areawide waste treatment management planning for non-designated areas.

Effective flood plain management is essential in the Irondequoit Creek basin to prevent the acceleration of flood damages. Adequate controls must be established to regulate future developments that will contribute to additional flood damages. Development and examination of alternative land use patterns in the flood plain is necessary for determining the best use of the flood plain compatible with the flood hazard. The capabilities of an Oconee-type study for hydrologic modelling, flood damage evaluations for alternative development patterns and evaluations of alternative non-structural flood plain management measures would meet our needs.

We do not have the financial capability to undertake an Oconee-type study in the Irondequoit Creek basin, nor could we contribute funds directly to the program. However, we could provide staff assistance to your office. Our assistance would include providing available information from past and ongoing work, assisting on coordination with other state and local interests, and technical assistance and guidance on the development of alternative land use patterns and the evaluation of water quality and flood plain management alternatives.

We would be pleased to cooperate with you on this important study in the Irondequoit Creek basin.

Sincerely,

Thomas P. Eichler

Thomas P. Eichler
Director, Resources Program
Development Subdivision

New York State Department of Environmental Conservation
P.O. Box 57, Route 20, Avon, N.Y. 14414

Peter A.A. Berle
Commissioner
Regional Director
Irwin H. King

January 19, 1978

Colonel Daniel D. Ludwig
Buffalo District Engineer
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

Re: NCBED - PN
Irondequoit Creek Watershed Study

Thank you for your letter of December 22, 1977, concerning an Oconee type study of Irondequoit Creek.

In response to your questions, Region 8 of the Department of Environmental Conservation recommends:

1. The Corps of Engineers gather information for estimating and defining a computer model to serve flood plain management and water quality planning in the watershed.

2. A committee should include: Monroe County Departments of Health Planning and Public Works (Division of Pure Waters), Genesee Finger Lakes Regional Planning Board, State Department of Environmental Conservation, State DEC Region 8 208 Planning Policy Advisory Committee members from Monroe and Ontario Counties and the Supervisors of each of the towns along Irondequoit Creek.

Regarding gathering of information we feel that the Corps of Engineers has most of the required information as a result of the Flood Plain Information Report prepared for the Buffalo District. We would be pleased to provide information about resource protection areas.

Master land use plans and general information are available from the Monroe and Ontario County Planning Departments and from the Genesee/Finger Lakes Regional Planning Board.

I have asked Regional Water Quality Engineer Paul Schmied to serve as our coordinator for this project and he has agreed to do so. Would you please address future correspondence to him and delete Messrs. Holmes and Wagner of this office from the mailing list.

We look forward to working with the Corps of Engineers on this study.

Sincerely,

Irwin H. King

City of Rochester

Thomas P. Ryan Jr.
Mayor

City Hall
30 West Broad Street
Rochester, New York 14614

January 11, 1978

Daniel D. Ludwig, Colonel
Corps of Engineers
District Engineer
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

The City of Rochester agrees that the development of a computer model to serve flood plain management and water quality planning in the Irondequoit Creek watershed would be a valuable exercise in this region. The Irondequoit Creek watershed is probably of an ideal size to serve as a pilot project for such a computer model and, hopefully, the model could be applied for larger watersheds such as the Genesee River watershed.

I would appreciate the opportunity to designate a representative to a committee on the Irondequoit Creek study. The previously formed Irondequoit Creek Watershed Study Committee would be an ideal body to participate in the study. Although the City would have less to contribute than some other communities as far as data are concerned for that watershed, I am sure that we would gain some valuable experience in studying and modeling the effects of land use on flood plains that could be applied to the Genesee River.

The City could make the following pertinent material available for the study:

1) Official Zoning Map for land in and bordering the watershed;
2) Existing Land Use Map for the City;
3) Rochester Zoning Ordinance;
4) Recreation Facilities Plan.

The Rochester Environmental Commission could be of value in commenting on study information and providing other information not included in the above materials. The current Commission chairman is Mr. Edward Olinger, 74 Nunda Boulevard, Rochester, New York 14610.

Sincerely,

Thomas P. Ryan, Jr.
Mayor
City of Rochester

TPR/lpm

Organized 1796

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-8649

January 9, 1978

Daniel D. Ludwig
Colonel, Corps. of Engineers
District Engineer
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel,

I have your letter of December 22 in hand and wish to give you a few responses.

First of all you ask if I feel that we should have a computer model. I guess my first reaction to that is that the question, "at what cost". My own feeling, and I am of course a layman, is that the problems of the Irondequoit are not that sophisticated that we would need to have a computer model to do this. I have a feeling that the money spent in building a model could be put into the plan in the form of excess control or capacity since this is a matter in which you can have the premature arrival of something that exceeds the 100 year cycle storm. My thought, in other words, is to simply plan in excess rather than to try to plan to too close of a degree.

In regard to establishing a committee I feel that this would be a good idea. We have a fellow by the name of Tim Downing who has had a good deal of practical experience and has been serving as our liaison person in this matter. I would suggest that the other Towns appoint similar staff people who can regularly attend and keep an eye on these things and to offer suggestions to your Corps and your work and, in turn, report back to the various municipalities.

As far as the material available to facilitate your study, I think that I would simply refer you to Lozier Engineers. These people have a library of all previous studies and, as you may realize, are about to undertake a comprehensive drainage study of the Town itself so that they will be replete with details and documents. This would bemuch better than trying to rummage through the old archives of the Town because this would be an incomplete and time consuming process.

Daniel D. Ludwig

I am taking the liberty of sending on a copy of our most recent Master Plan review which will set forth the zoning and the planned zoning to a pretty good extent. Our detailed zoning map is only one and this is kept at the Town Hall.

Apparently, growing out of bitter experience, we have found it best to have only one map and make sure that this is up to date and complete in every detail. I know that in years past copies were sent out or picked up and these, of course, became obsolete. Then we found that people were using the obsolete maps and making all sorts of commitments based upon outdated situations. In order to avoid this we have only the one map.

The Town of Pittsford has a full panoply of advisory committees and commissions. The ones that would be most interested in working with you closely, would be the Environmental Board and this is a very active group. We also have a Parks and Recreation Committee that might, upon occasion, be interested in what you are doing or have information to offer from their plan which would help.

If anything further is needed please give us a call or drop a line.

Sincerely,

Paul Spiegel

PMS/b
encl.

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

TOWN of HENRIETTA

475 CALKINS ROAD • HENRIETTA, NEW YORK 14467 • TELEPHONE 334-7700

JOHN E. KELLY
Supervisor

KEITH C. MURPHY
Town Clerk

CARL R. SWETMAN
~~LAWRENCE B. KOHSMAN~~
MICHAEL J. MURPHY
DAVID H. MAILLIE
Councilmen

January 9, 1978

Mr. Daniel D. Ludwig, Colonel
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Re: Irondequoit Creek Study - Response to inquiry.

Dear Colonel Ludwig:

As your report on the Irondequoit Creek drainage basin indicated, the Town of Henrietta has experienced extensive flood damage in that area of Town located in the referenced watershed. We are attempting, on a year by year basis, to improve the characteristics of channels located in the Allen Creek area with our limited resources. Obviously, a total corrective action would involve great expense and disruption since the area is highly developed.

The goals of developing a computer model are very desirable and necessary for future planning. The model, however, does not provide any solution to existing problems which, in fact, prompted the original study of this watershed. We still feel it desirable that the Corps consider the feasibility of physical improvements in the Allen Creek drainage area, with the ultimate goal being relief of existing problems. We do agree, in theory, that a computer model is desirable, in that, it will provide a useful tool for future watershed planning activities.

The creation of a watershed committee could provide a necessary link between concerned units of government. Communication of watershed members would of course be greatly improved, and a long range plan could possibly be worked out for the entire region. There are, however, several potential, undesirable factors which may arise from such a committee.

How much power will it possess? How will thepower be distributed? The downstream communities have much to gain by such an arrangement, that is, control of upstream activities. The upstream communities have to face the potential loss of home rule over their own development

Printed on recycled paper

Re: Irondequoit Creek Study - Response to inquiry.

plans. This situation could result in an ultimate detriment to intergovernmental cooperation.

A duplication of effort may also result from such a committee. A development of any project in our Town is presently subjected to both extensive review from many agencies, and Local, County, State, and Federal regulations. We would support a committee based on communication of mutual interest and long range planning. Perhaps planning guidelines could be established through such a committee to the benefit of all communities in the watershed.

Most of the material you listed for data collection may be obtained through our Engineering, Building and Planning offices at the Town Hall.

Thank you for this opportunity for comment. We will be looking forward to the outcome of your proposal and to the next workshop meeting.

Very truly yours,

John E. Kelly

John E. Kelly
Supervisor

xc: Henry K. Corneles
John Burchill
File

RICHARD D. WILES
Supervisor

Town Of Brighton
MONROE COUNTY, NEW YORK
2300 ELMWOOD AVENUE / ROCHESTER, NEW YORK 14618 / 473-8800

January 4, 1978

Colonel Daniel Ludwig
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, N. Y. 14207

Dear Colonel Ludwig:

In reply to your letter of December 22, 1977, the Town of Brighton is very interested in participating in a Flood Plain Management Program.

Recently, we have undertaken a drainage study of our Town and we will have much information concerning our town problems to present to you.

Our Commissioner of Public Works, John Laird, and Building Inspector Gary Shirley, will be able to provide much information as far as highway maps and zoning maps are concerned.

We therefore would like to see a committee formed that would include the Supervisor, Public Works Commissioner, Building & Planning Heads, and a representative from our Citizens Drainage Study Committee.

In addition, all municipalities located in the Irondequoit Creek area should be represented in order that progress can be made to implement proper planning procedures to protect the downstream towns from flooding because of upstream developments.

Sincerely,

TOWN OF BRIGHTON

Richard D. Wiles
Supervisor

RDW:ps

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Peter A. A. Berle,
Commissioner

November 14, 1977

Mr. Donald M. Liddell
Chief, Engineering Division
Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

This is in response to your letter of September 16, 1977 regarding activities that could be undertaken on the recently funded Irondequoit Creek study to assist in land use and flood plain regulations.

Your letter was discussed with Colonel Ludwig and staff on October 14 and we agreed that measures such as the development of model flood plain regulations and computer modeling for land management (Oconee-type studies) could provide very useful information for us and local officials in the basin.

We noted our particular interest in including parameters that would relate to non-point pollution sources that are of particular concern now in the Irondequoit Creek Basin. Enclosed is a proposal for a non-point source study in the basin, prepared by the Monroe County Pure Waters Agency. This proposal includes some of the areas of major concern and would be a good starting point for your evaluation of how these needs could be met through your study.

We will be pleased to arrange for further staff discussions as necessary.

Sincerely,

Thomas P. Eichler
Director, Resources Program
Development Subdivision

Enclosures

NON-POINT POLLUTION STUDY PROPOSAL
IRONDEQUOIT CREEK WATERSHED

By Pure Waters

PROBLEM: Urban Runoff Pollution

AREA AFFECTED: Irondequoit Creek Watershed

DESCRIPTION: The Irondequoit Creek watershed in Monroe County has experienced steady growth over the last few years. Suburbanization of the watershed has been accompanied by increased runoff and increased pollution into Irondequoit Creek and its tributaries. Land erosion on development and construction sites contribute sediment into waterways. General runoff from roads, parking lots, and residences result in a variety of pollutant such as salt, fertilizers, heavy metals, etc. Finally, many residential areas in the watershed utilize individual septic systems which can contribute organic matter and nutrients to storm runoff.

Monitoring water flow and water quality has been in progress for several years to determine the before and after as Irondequoit Interceptor is completed. The interceptor picks up the small and scattered sewerage treatment plants that had discharged to Irondequoit Creek. Continuing the monitoring program provides an opportunity to determine the loading caused by urban storm water runoff separated from the contributions of point sources. Expanding the program by careful selection of monitoring locations can provide information of the loading from rural runoff and agricultural activities.

The effect of specific non-point service activities on the area's water quality is not known. Therefore, a monitoring program is needed aimed at determining the specific causes and severity of the pollution in the watershed. This information is essential to identifying the significant pollution-contributing activities in the watershed and developing a management program aimed at their

POLLUTANTS: Sediment, nutrients, organic matter, fertilizer, salt, oil, grease and heavy metals.

County of Monroe
Office of County Manager
110 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

LUCIEN A. MORIN
COUNTY MANAGER
DIRECTOR OF FINANCE

October 12, 1977

Donald M. Liddell, Chief
Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara St.
Buffalo, NY 14207

Subject: Revised Irondequoit Creek Study Outline

Dear Mr. Liddell:

I have reviewed the revised plan of study for the Irondequoit Creek watershed study and strongly support the need for such a study generally along the lines you have proposed. I wish to assure you of the County's cooperation in the conduct of this study and our desire to work with the Corps and the municipalities in the watershed to effectively address the flooding and related water and land management problems of the watershed. Mr. Martin, County Planning Director, has assured me that the County Planning Department is prepared to commit staff resources to this study.

Mr. Martin informed me that he met last week with John McCarthy of your staff and William Larsen of Larsen Engineering, to further discuss the revised plan of study as well as some proposals that Bill Larsen has made for studying the watershed. Mr. Martin believes, and I concur in his view, that a pre-preliminary study of the type proposed by Larsen Engineers would help to more precisely define the problems of the watershed so that any subsequent tasks that are undertaken as part of the Irondequoit Creek Study will directly address, in scope and magnitude, the problems identified.

Attached are specific comments relating to the items in your revised plan of study. Should you have any questions concerning these comments, please contact Don B. Martin (716-428-5475) or John Lamb (716-428-5468) of the County Planning Department.

Thank you for the opportunity to review your revised plan of study. I am confident that if the program proceeds along these lines, including a pre-preliminary study as proposed by Bill Larsen, that the objectives of the county will be met. We look forward to cooperating with the Corps and local governments in achieving the objectives of the Irondequoit Creek Watershed Study.

Sincerely,

Lucien A. Morin

LAM/DBM/mm
Attachment
xc: Hon. Frank J. Horton, Congressman, 34th District
Pamela Hopeman, Chairperson, Monroe County Planning Board
George Gardner, Chairman, Monroe County Planning Council
Henry Williams, Chairman, Genesee Finger Lakes Regional Planning Council
Ned Holmes, Department of Environmental Conservation, Avon
John Stainton, Commissioner of Community Development, City of Rochester
Richard Wiles, Supervisor, Town of Brighton
John Kelly, Supervisor, Town of Henrietta
Squire Kingston, Supervisor, Town of Mendon
Irene Gossin, Supervisor, Town of Penfield
Lake Edwards, Supervisor, Town of Perinton
Paul Spiegel, Supervisor, Town of Pittsford
Clement McGhan, Councilman, Town of Victor
Raymond Parrish, Supervisor, Town of West Bloomfield
Anthony Della Pietra, Mayor, Village of East Rochester
Peter McDonough, Mayor, Village of Fairport
David C. Shepherd, Mayor, Village of Pittsford
William Larsen

TOWN OF PENFIELD

3100 Atlantic Ave.
Penfield, N.Y. 14526

At the Regular Meeting of the Penfield Town Board held at the Penfield Town Hall, 3100 Atlantic Ave., Penfield, Monroe County, New York on September 21, 1977 at 8:00 PM, EDT, the following members were

Present:	Irene L. Gossin	Supervisor
	Lindsey Embrey	Board Member
	Anna Bundschuh	Board Member
	Carl Nielsen	Board Member
Absent:	Elmer Peck	Board Member

The following resolution was presented by Supervisor Gossin who moved its adoption:

WHEREAS, the Corps of Engineers has been authorized by the United States Congress to complete a Plan of Study for purposes of controlling flooding along Irondequoit Creek, and

WHEREAS, the Town of Penfield would benefit greatly from flood controls, and

WHEREAS, a Steering Committee consisting of representatives of communities within the watershed was named in the fall of 1976, and

WHEREAS, the Town of Penfield has repeatedly urged that the Steering Committee be reactivated and that the Corps utilize the Committee,

NOW, THEREFORE, BE IT RESOLVED that the Corps of Engineers continue to set a high priority to provide floodwater management within the Irondequoit Creek Watershed in order to reduce the hazard of loss of life and property, and

BE IT EVEN FURTHER RESOLVED that the Corps of Engineers strongly recommend the Irondequoit Creek Watershed as a subject area for a computerized study (i.e. Oconee Study) which would provide a valuable tool available to local governments in their consideration of further future development in the watershed.

The resolution was seconded by Board Member Embrey and was duly adopted with all members present voting "Aye".

Dated: Sept. 23, 1977

Nancy Gunther, Town Clerk

TOWN OF PENFIELD

3100 Atlantic Ave.
Penfield, N.Y. 14526

IRENE L. GOSSIN, Supervisor

September 26, 1977

Daniel D. Ludwig, Colonel, Corps of Engineers
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, N. Y. 14207

Dear Col. Ludwig:

Enclosed with this letter please find a resolution adopted by the Penfield Town Board relative to the Irondequoit Creek Flood Study. As expressed to you in our recent meeting, the Town of Penfield is most desirous of continued involvement as well as the involvement of all communities in the watershed. For that reason we urge the Corps to consider the Irondequoit Creek Study a high priority item.

We are also greatly interested in the possibility of an "Oconee" type of study and urge the Corps to pursue that approach, as well.

May I express my thanks for your personal interest and especially for your August 18th visit.

Yours truly,

Irene L. Gossin
Supervisor

ILG:bf
Enc.
cc: Penfield Town Board

Organized 1796

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-8649

September 21, 1977

Colonel Ludwig
District Engineer
Department of the Army
Buffalo District
Corp of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Ludwig:

This letter is to inform you that the Town Board of Pittsford passed a formal resolution last night urging the Corp of Engineers to proceed with their proposed Irondequoit Creek Drainage and Flood Study.

The Town Board wishes to let you know that we are willing to cooperate in any way.

It might be further added that the Town Board last night decided to select Lozier Engineers to make a comprehensive drainage study of the whole Town of Pittsford, which would, of course, include the Irondequoit Valley so that their work will be implementing and supplementing your own.

We are interested.

Sincerely,

Paul M. Spiegel
SUPERVISOR
TOWN OF PITTSFORD

PMS/bh

Town of Perinton

31 SOUTH MAIN STREET • FAIRPORT, N.Y. 14450 • PHONE: 223-0770

September 20, 1977

Colonel Ludwig, District Engineer
U. S. Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

RE: IRONDEQUOIT CREEK STUDY - TOWN OF PERINTON

Dear Colonel Ludwig:

As Supervisor of the Town of Perinton, I wish to express our interest in a continuance of the study of the Irondequoit Creek and its watershed. The Town of Perinton has played a leadership role in storm water and sediment control and is therefore most interested that other towns and units of government pursue a similar positive program.

May we add our endorsement to that of others of a continuation of your study. We wish to stress, however, that the involvement of local people and units of government is most important.

Very truly yours,

Lake B. Edwards, Supervisor
Town of Perinton

LBE:jp

cc: Wm. C. Larsen, P.E., P.C.
Donald Martin, County Planning
Town Board
R. A. Burger
J. W. Fulreader, Esq.
D. Schaeffer
S. Baldwin

TOWN OF MENDON

9 North Main Street
Honeoye Falls, N. Y. 14472

JUNE L. SMITH
TOWN CLERK
TAX COLLECTOR
TEL. (716) 624-2300

September 16th, 1977

Mr. Donald M. Liddell, Chief, Engr. Div.
Department of the Army, Buffalo District
Corps. of Engineers
1776 Niagara Street, Buffalo, New York 14207

Dear Mr. Liddell:

Enclosed please find certified copy of a Resolution which was unanimously passed by the Town Board at its regular meeting on September 12th, requesting the United States Army Corps of Engineers to continue the study of the Irondquoit Creek Drainage Basin.

Very truly yours,

June L. Smith
Town Clerk

JLS/mo
Enclosure

STATE OF NEW YORK
COUNTY OF MONROE
TOWN OF MENDON
} SS:

(SEAL)

Town Board Resolution—Certificate No. 337. Williamson Law Book Co., Rochester, N. Y. 14609

I, JUNE L. SMITH, Town Clerk of the Town of Mendon, Monroe County, New York, DO HEREBY CERTIFY, that I have compared the foregoing with the original resolution adopted by the Town Board of the Town of Mendon at a meeting of said Board held on the 12th day of September, 19 77, and that the foregoing is a true and correct transcript of said original resolution and of the whole thereof, and that said original resolution is on file in my office.

I DO FURTHER CERTIFY that each of the members of said Town Board had due notice of said meeting, and that Squire J. Kingston Supervisor, and Russell C. Matthews, William E. Benham, Philip B. Dattilo and Roberta J. Barnes, Councilmen Town Justices, were present at such meeting, and .....(Name), ...(Title) was absent.

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of the Town of Mendon, this 16th day of September, 1977.

.....
Town Clerk.

RESOLUTION

WHEREAS, the U. S. Army Corps of Engineers has commenced a study of the Irondequoit Creek Drainage Basin, and

WHEREAS, the source of said Irondequoit Creek is located in the Town of Mendon and said creek flows through a large part of said Town, and

WHEREAS, it is deemed to be in the best interest of the Town of Mendon to have Irondequoit Creek protected and preserved in a form that is environmentally, aesthetically and economically beneficial throughout its drainage basin,

NOW THEREFORE IT IS RESOLVED, that the Town Board of the Town of Mendon hereby requests that the U. S. Army Corps of Engineers continue the study of the Irondequoit Creek Drainage Basin, and submit its recommendations concerning Irondequoit Creek to the municipalities within which said drainage area is located.

RICHARD D. WILES
Supervisor

Town Of Brighton
MONROE COUNTY, NEW YORK
2300 ELMWOOD AVENUE / ROCHESTER, NEW YORK 14618 / 473-8800

September 15, 1977

Mr. John McCarthy
Army Corps of Engineers
1776 Niagara St.
Buffalo, N. Y. 14207

Dear Mr. McCarthy:

At our Town Board meeting held on September 14, 1977, our Board officially went on record in favor of the Irondequoit Creek Drainage Study Program.

This program is badly needed and controls should be implemented as soon as possible to correct water run-off in this area.

Our Board will cooperate fully in this program and ask the Corps of Engineers to proceed as soon as possible.

Sincerely,

TOWN OF BRIGHTON

Richard D. Wiles
Supervisor

RDW:ps
cc: Mr. Wm. Larsen
44 Saginaw Drive
Rochester, N. Y. 14623

William C. Larsen, P.E
John F. Karle, P.E
Richard N. Passero, P.E

William C. Larsen, P.E., P.C.

CIVIL - SANITARY - MUNICIPAL
ENGINEERING
44 SAGINAW DRIVE - ROCHESTER, N.Y. 14623
AREA CODE 716/473-3460

Franklin Jack Schultz P.E
Dale F. Green P.E
James R. Greene P.E
Hasim A. Hasim P.E
Shree R. Shrivastava P.E
Iqbal M. Singh P.E
Peter J. Smith P.E
Yash P. Wadhwa P.E

Lavern R. Casagrino P.L.S
Edward T. Nicolella P.L.S

September 8, 1977

District Engineer
US Army Corps of Engineers
1776 Niagara St
Buffalo, N.Y. 14207

Dear Col. Ludwig:

As you may know, on Wednesday September 7, 1977, John McCarthy of your staff participated in a meeting relative to the Irondequoit Creek Watershed. This was an effort by the Towns involved to bring together a coordinated program of Corps activity, local land use planning, input from the Soil Conservation Service and others.

The purpose of this letter is simply to inform you of how pleased we were with John McCarthy's input at this meeting. As we understand it, you are proposing a meeting in October or November, at which time a more definitive plan will be presented to all the folks that were in attendance at last night's meeting. There seems to be considerable enthusiasm now generated and we all look forward to that meeting.

Once again, many thanks for John's assistance during the meeting.

Very truly yours,

WILLIAM C. LARSEN, P.E., P.C.

W.C. Larsen

WCL/pr

William C. Larsen, P.E.

cc: Irene Gossin, Supervisor, Town of Penfield

William C. Larsen, P.E.
John F. Kyle, P.E.
Richard N. Fissero, P.E.

William C. Larsen, P.E., P.C.

CIVIL · SANITARY · MUNICIPAL
ENGINEERING
44 SAGINAW DRIVE · ROCHESTER, N.Y. 14623
AREA CODE 716/473-3460

Frederick J. Burgdorf, P.E.
Dale L. Green, P.E.
James P. Greene, P.E.
Hakim A. Hasan, P.E.
Shree P. Srivastava, P.E.
Iqbal M. Singh, P.E.
Peter J. Smith, P.E.
Yash P. Wadhwa, P.E.

Lavern R. Cessano, P.L.S.
Edward T. Nowotka, P.L.S.

August 25, 1977

TO: TOWN AND VILLAGE OFFICIALS

RE: IRONDEQUOIT CREEK WATERSHED

Sometime ago I wrote to most of you suggesting that some coordination appeared necessary between the Corps of Engineers and local governments relative to the on-going Irondequoit Creek Study. I made the suggestion that possibly our office could undertake this. We have had an extremely favorable response to this suggestion including one from the Corps of Engineers.

Accordingly, we have set a meeting at the *Penfield Town Hall* at 8:00 PM on Wednesday, September 7, 1977. May we strongly urge attendance by representatives of the Boards of your Town or Village? This is a wonderful opportunity to develop a model watershed plan which can be duplicated elsewhere in the Rochester metropolitan area.

Very truly yours,

WILLIAM C. LARSEN, P.E., P.C.

W. C. Larsen

WCL/pr

William C. Larsen, P.E.
President

Organized 1796

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-2320

July 7, 1977

Mr. John Zosich
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Zosich:

I have your letter of June 30, 1977 and it has given me some idea of the nature of the work that will be performed by the Corp of Engineers in the Irondequoit Valley.

This, together with Bill Larson's release of a couple of days ago, leads me to realize more and more and leaves me to think more and more about the importance of flood control ordinances of the Towns and the importance of these things in your work.

I note that the corp cannot really get into this directly so that it will depend upon cooperative effort by the Towns.

I note your phrase "isolation of flood control problems" and I feel that this is something that will be pretty hard to acheive without cooperation on all sides.

I would like to let you know that the Town Board has talked with some well-known engineering firms in the Rochester area and have asked for the submission of proposals to study the drainage problems of the Town.

No doubt we will be giving a contract to one or another of these firms in the near future. I have noted in the proposal so far received that they all mention several times that they will be in close touch with the Army and its past and future studies. They will be in touch with you and I will be pleased to hear anything from you directly.

Sincerely,

Paul M. Spiegel

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

PMS:pd
cc: William Larson

TOWN of HENRIETTA

475 CALKINS ROAD • HE... • ...
JOHN E. KELLY
Supervisor
KEITH C. MURPHY
Town Clerk
CARL R. SWETMAN
LAWRENCE B. KOHSMAN
MICHAEL J. MURPHY
DAVID H. MAILLIE

June 29, 1977

Mr. Donald M. Liddell
Chief, Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Re: Irondequoit Creek Watershed

Dear Mr. Liddell:

The Henrietta Planning Board is in receipt of your letter dated May 16, 1977.

The Planning Board examined the material and has no comment.

Very truly yours,

Albert Scardetta

Albert Scardetta, Chairman
Henrietta Planning Board

AS:vs

xc: J. Keigher
J. Kelly
Planning Board Members
Engineering Department
Building Department

New York State Department of Environmental Conservation
Box 57, Avon, New York 14414

Peter A. A. Berle,
Commissioner

Irwin H. King
Regional Director

June 21, 1977

Mr. Donald Liddell
Chief, Engineering Section
Corp of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

Irwin King has asked that I respond to your recent letter to him concerning the flood control measures being considered at the present time in the Irondequoit Creek Watershed. We have a vital interest in resource considerations in the Irondequoit Creek Watershed,and support the need for non-structural measures as being most effective in preserving the integrity of this watershed.

A structural plan for levees and channelization of Irondequoit Creek in the Panorama Plaza area must take into consideration the fact that this reach of stream is utilized during the spring by anadromous rainbow trout from Lake Ontario as a passage to higher quality waters upstream.

This area of Irondequoit Creek is not normally inhabited by brown trout because of the direct adverse affects on water quality imposed by upstream sewage treatment plant effluent. When the effluents from these plants are diverted out of the Irondequoit Watershed then this section quite possibly may return to its historical trout potential. Diversion will begin this year.

Channelization of this section will negate gains made by the forthcoming sewage diversion. Wide shallow channels will promote summer ambient temperatures that exceed the upper lethal of brown trout and rainbow trout.

The construction of levees with sufficient set back from stream banks should not adversely affect the trout potential of this section to the degree experienced by direct channelization practices. However, clearing the shade producing vegetation between the levees and streams, common practice, would adversely affect this trout potential.

It is my understanding that the Corp of Engineers has the capability through OConee Computer Modeling to look at a watershed such as this one specifically

DFJ

in regard to land treatment manipulations and the impact of such manipulations on the water resources of the basin. I would like to suggest that this approach be considered for your workshop that you have tentatively scheduled in the fall of 1977.

We appreciate the opportunity to review this proposal and you can expect our continued assistance as the project moves forward.

Very truly yours,

Edward D. Holmes

Edward D. Holmes
Regional Supervisor of
Fish & Wildlife
Region #8

EDH:er

cc: R. Miles
J. Kelly
D. Deming
S. Kingston
I. Gossin
P. Spiegel
M. Strong

JUSTICES

HIGHWAY SUPERINTENDENT
Robert A. Hendricks

MALCOLM D. STRONG, Supervisor
MARY MILLAR, Town Clerk

TOWN OF VICTOR

85 East Main St
Victor, New York 14564
Ontario County
Phone 716-924-7141

COUNCILMEN

COLLECTOR
Mary Mae McCarthy

June 7, 1977

Department of the Army
Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Attention: Mr. Donald M. Liddell, Chief
Engineering Division

Dear Mr. Liddell:

In reply to your letter of May 16, 1977, the Planning Board of the Town of Victor is vitally interested in the development of the Irondequoit Creek Watershed within the Town of Victor, Ontario County, as well as areas upstream thereto.

Mr. Kirby Milton, a representative of the Victor Town Planning Board attended some of your meetings and at that time requested a preliminary draft plan prepared by the Corps of Engineers on Irondequoit Creek in 1976 and to date no copy has been received.

The Town of Victor Planning Board proposed that no stream channellization, levees, detention dams and structures be built along Irondequoit Creek within the Town of Victor, the creek should not be utilized as a drainage sewer nor should it be altered for the benefit of those who unwittingly locate in existing floodways.

Land development upstream within the watershed doesn't necessarily increase the rate of run-off to downstream areas when development is made in a practical manner. All of the development in the Town of Victor is approached with this problem being of prime concern.

The cooperation of both the Corps of Engineers and neighboring governmental bodies would be appreciated to help us accomplish satisfactory development. The Corps of Engineers would be the logical body to spearhead an effort to enact uniform laws in all affected communities.

Yours very truly,

Howard J. Gillan

Howard J. Gillan, Chairman
Victor Town Planning Board

HJG/ca

ERDMAN, ANTHONY, ASSOCIATES

CONSULTING ENGINEERS & PLANNERS

P. O. BOX 9589 • 242 ANDREWS STREET
ROCHESTER, NEW YORK 14604
(716) 325-1866

PAUL B. ERDMAN, P.E.
EDWIN L. ANTHONY, P.E., L.S.

ALFRED F. LYNG, P.E.

A. J. BEDARD, JR., P.E.
D. J. BERGMANN, P.E.
R. M. GOSS, P.E.
R. KETCHUM, P.E.
F. J. McSHEA, P.E., L.S.
G. R. SMELTZ, P.E.
E. C. TONIAS, P.E.
P. TREER, P.E.
D. C. TUTTLE, P.E., L.S.
R. B. ULP, P.E.

June 6, 1977

Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Attention: Mr. Donald M. Liddell

Re: Irondequoit Creek Watershed
Present Flood Control Study Outlook
May 1977

Dear Mr. Liddell:

In response to your request for comments on the above mentioned study, in a letter dated 16 May 1977, we are pleased to present the following.

1. We agree with your alternatives for providing flood protection measures for the Panorama Plaza area. This is consistent with the study done by Erdman, Anthony, Associates in October 1960 for the Monroe County Drainage Agency. This study was reviewed by Corps personnel as part of the current study outlook.

2. In addition, our firm undertook a "Flood Study" for the Penfield Park Apartments following record rainstorm of 2 hour duration in May 1974 when the apartment area underwent extensive flooding that caused severe damage to lower apartments. The results of the study indicated that with proper flood control measures on Irondequoit Creek in the Panorama Plaza area and proper internal drainage controls these damages could be minimized and possibly eliminated.

The above comments are without the benefit of having the opportunity to review the Plan of Study in detail. We would appreciate receiving a copy of the current study and would be pleased to respond to the other damage areas as well.

It is hoped that this project will receive more attention from local interests as you proceed with your feasibility study. We look forward to attending your workshop in the fall of 1977.

Very truly yours,

ERDMAN, ANTHONY, ASSOCIATES

F. J. McSHEA, P.E., L.S.
Associate

FJM:AP

TOWN of IRONDEQUOIT

AVISOR
ALD A. DEMING
NCILMEN
ERT E. KANE
HONY J. COSTELLO
J. CHIPP
MAS E. LENWEAVER

June 1, 1977

Donald M. Liddell
Chief, Engineering Division
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

The Town of Irondequoit would appreciate knowing when and where the workshop in the fall of 1977 will take place. We realize that other communities have a much greater interest, due to greater flood problems and their input is what is basically needed, but we wish to remain involved.

The Town of Irondequoit has no specific requests for further studies at this time.

Respectfully yours,

Michael A. Tanner
Building Inspector

MAT/1

BOARD OF TRUSTEES
Peter D Quinzi
Dorothy Dinnetti
Bert E. Fitzsimmons, Jr.
Alfred Dezio

ATTORNEY
Robert P. Hanke

Village of East Rochester
EAST ROCHESTER, NEW YORK
Mayor — ANTHONY DELLA PIETRA

CLERK TREASURER
Frances R. Cimorelli

SUPT. OF PUBLIC WOR
Armand Pizzingrilli

CONSULTING ENGINE
William C Larsen

May 31, 1977

Mr. Donald M. Liddell
Chief, Engineering Division
Buffalo District, Corps of Engineers
1776 Niagra Street
Buffalo, New York 14207

Dear Sir:

In response to your letter dated May 16, 1977, addressed to Mayor Anthony Della Pietra, the following information is submitted:

#1. Armand Pizzingrilli, Supt. of Public Works, was designated by the Village Board to represent the Village at all meetings.

#2. Mr. Pizzingrilli attended 3 meetings, at the last meeting he was informed, his attendance was not necessary, because all land within the Village that was in the Irondequoit Creek water shed was Village owned; being used for parks and Dept. of Public Works garage and storage.

#3. Mr. Pizzingrilli will be available to attend the work shop tentatively scheduled for the Fall of 1977.

#4. We recommend that the old Spring Lake property be considered for a detention basin and that the Villages' Eyer Park not be considered.

Sincerely yours,

VILLAGE OF EAST ROCHESTER

Armand Pizzingrilli

Armand Pizzingrilli
Supt. of Public Works

AP/anc

Organized 1796

Town of Pittsford

MONROE COUNTY
11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534
PHONE 586-2320

May 27, 1977

Mr. Donald Liddell
Chief, Engineering Division
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Mr. Liddell:

I have your letter of May 16th along with the Flood Control Study Outlook and I note the fact that you indicate that there has been little local meaningful response as yet.

Please let me assure you that the Town of Pittsford is interested in the flood control and do hope that you can proceed to lay out a comprehensive plan which will help.

I would hark back to an idea which I presented earlier and that is to the thought of establishing a giant ever-flowing retention pond through the Irondequoit Valley in the Town of Pittsford. The flood plains areas are extensive and are for the most part, undeveloped, and might be acquired for such a giant retention pond.

The Canal itself and the culvert under the Canal acts something like this at the present time and the banks of the Canal could be used as a retention dam. Obviously, a great care would have to be taken to make sure that it was strong enough to withstand the high waters. This idea seems feasible to me.

Beyond this, the Army Corp of Engineers might develop a model drainage control ordinance which can be offered and recommended to all of the Towns contributing to the flooding in the Irondequoit Valley.

In the Town of Pittsford now we are turning to one or two firms of engineers to develop a comprehensive drainage control system and we hope within a few years to have this in a working ordinance form. We are interested in doing our share since the Department of the Army is an over-all organization and is concerned with the whole valley and does have great prestige, they might be able to convince all the participating municipalities to get in line with some model ordinance.

Please be advised that the Town of Pittsford is interested in your study, hope that it goes forward, and will stand ready to cooperate.

Sincerely,

Paul Spiegel

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

PMS:jmp

RICHARD D. WILES
Supervisor

Town Of Brighton
MONROE COUNTY, NEW YORK
2300 ELMWOOD AVENUE / ROCHESTER, NEW YORK 14618 / 473 8800

May 20, 1977

Mr. Donald M. Liddell, Chief Engineering Div.
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara St.
Buffalo, New York 14207

REF: Irondequoit Creek Watershed

Dear Mr. Liddell:

At the present time, the Town of Brighton has hired the Engineering Firm of O'Brien and Gere to do a complete study of our drainage areas.

This study should be completed within the year and we then will know what way to go in solving our drainage problems.

We would be very glad to participate in a workshop in the fall, and by then we will probably be able to provide you with more specific information concerning our study in this area.

Sincerely,

TOWN OF BRIGHTON

Richard D. Wiles

Richard D. Wiles
Supervisor

RDW:ps

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
100 Grange Place, Room 202
Cortland, New York 13045

February 9, 1977

Col. Daniel D. Ludwig
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Col. Ludwig,

This letter responds to your request for comment regarding the Buffalo District Draft Plan of Study for flood control and allied purposes in the Irondequoit Creek, Watershed, New York. Investigations for improvement were authorized in a resolution through the House of Representatives, Committee on Public Works authorizing a survey on Irondequoit Creek, New York and tributaries, including Allen Creek. The authorization is contained in Section 208 of the Flood Control Act of 1965 (Public Law 89-298) adopted 27 October 1965. Our comments are provided as field level review for guidance in your development of a plan of acting specifying the proposed course of study for a feasibility report and are not the comments of the Department of Interior as outlined under Section 2 (b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

We have met with New York State DEC and discussed study needs for the proposed project. Water quality in the Irondequoit Creek Watershed is being improved and contains a very good Brown Trout Fishery. Some steelhead spawning is found up to 25 miles upstream from the mouth of the creek. Sewage treatment plants being developed in the area are contributing to the increase in water quality. Any development within the Irondequoit Creek Watershed must not in any way degrade existing or future water quality conditions.

Recent studies have shown a strong correlation between degraded trout water and sewage plant discharges on Irondequoit Creek. It was found that above the Barge Canal crossing, which is also the point of discharge for the most upstream STP, brown trout (Salmo trutta) were common in Irondequoit Creek. Brown trout of wild and hatchery origin were sampled upstream to Trout Brook in the vicinity of Mendon. As the sampling proceeded downstream of the canal, fewer

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

brown trout and more tolerant fish species were encountered. Sewage effluents noted were of poor quality and obviously affected species composition.

A study to monitor the downstream movement of the existing trout population and changes in the benthic community would provide a meaningful gage to assess the benefits of the Pure Waters program to divert sewage from the small STP's to one major facility. A study outline follows:

OBJECTIVE - To gage the success of the sewage diversion program on Irondequoit Creek by quantifying changes in the aquatic ecosystem of that stream.

SCOPE - Indicator parameters to be studied in the Irondequoit system are fish, benthos, and chemical characteristics.

Fish studies to note species, abundance, growth characteristics and general condition.

Benthic studies to include the computation of diversity indices, equatibility and linear similarity coefficients.

Chemical and physical characterization will monitor flow, water temperature, dissolved oxygen and BOD.

Excellent undeveloped wetlands exist in the lower Irondequoit Basin. Many excellent wetlands exist in the upper basin particularly the area delineated on plate 7 of the Draft POS. Upland habitat throughout the area is also important. At present, a substantial amount of local support exist to protect the resource.

Any plan developed must address the important fishery and wiidlife resources within the project site.

We appreciate the opportunity to comment on the proposed Irondequoit Creek and tributaries project at this time and look forward to further coordination on the project.

Sincerely,

Acting Field Supervisor

jle

County of Monroe

NEW YORK

DEPARTMENT OF PLANNING
301 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

DON B. MARTIN, DIRECTOR

TELEPHONE
(716) 428-5461

December 1, 1976

Subject: Irondequoit Creek
Watershed Study

Honorable Legislator:

We are presently coordinating Monroe County's effort in the federally sponsored Irondequoit Creek Watershed Study. The Study area consists of the Irondequoit Creek Drainage Basin in Monroe, Ontario and Wayne Counties and contains 14 municipalities as shown on the attached map. These towns, villages, and the City of Rochester have been requested to appoint representatives to a Study Committee to help the United States Army Corps of Engineers meet the study objective. The objective is to determine the nature, extent, and feasibility of improvements for flood management and allied purposes. General planning objectives include flood control, water enhancement, water supply provision, aesthetic improvement, recreation potential, erosion and sedimentation control, and improvement of cultural resources.

The additional attachments indicate what has already occurred since the Study's inception in June of 1976. As shown on the attached letter to Colonel Hughes of the Corps of Engineers, it is our position that long-range floodplain management rather than structural solutions to problems should be the preferred alternative.

The communities have met to discuss activities such as the federal and state permit programs and will meet again to be further advised of Federal Insurance Administration requirements and programs in the study area by a representative of the FIA. The meeting will be held in Room 1 of the Monroe County Farm and Home Center at 7:30 p.m. on December 16.

Finally, your name has been added to the mailing list for receipt of information regarding the Study and meetings should you wish to attend this or be advised of any other of the coordination meetings.

Sincerely,

John H. Aughenbaugh

John H. Aughenbaugh
Senior Planner - Design

JHA/cm
c: Lucian A. Morin, County Manager
J. B. Jesmer, Deputy County Manager
Martin A. Foos, Chairman, Monroe County Planning Board
George B. Gardner, Chairman, Monroe County Planning Council
John McCarthy, United States Army Corps of Engineers

Attachments

County of Monroe

NEW YORK

Department of Parks
375 Westfall Road
Rochester, N.Y. 14620

Telephone:
244-4640

August 24, 1976

Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineers Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

RE: Plan of Study Irondequoit Creek, New York and Tributaries Including Allen Creek, For Flood Control and Allied Purposes.

Dear Colonel Ludwig:

The Department of Parks County of Monroe, New York has a very definite interest in the Irondequoit Creek Study relative to flood control in the Irondequoit Creek watershed. Several areas under the jurisdiction of this department and operated as park and recreation areas for the citizens of Monroe County occupy the low-lying flood plains of Irondequoit Creek. These areas are as follows:

1. Powder Mills Park (Shown on Plate 7 of the POS)
2. Ellison Park (Shown on Plate 5 of the POS)
3. Areas in the Wetlands South of Irondequoit Bay extending from Empire Boulevard south to Browncroft Boulevard (Shown on Plate 5 of POS)
4. Areas along the easterly and westerly shoreline of Irondequoit Bay as follows:
   on the westerly shoreline, beginning at Empire Blvd. and extending approximately 4400 feet to the north;
   on the easterly shoreline, beginning at a point approximately 2000 feet north of Empire Blvd. and extending approximately 4700 feet to the north.

NOTE: Only part of the above (westerly side) shows on Plate 5 of the POS.

Ellison Park and Powder Mills Park have existed as County park areas for approximately fifty (50) years and have been operated in a manner to meet many recreational needs of the residents of the community. Powder Mills Park has occasionally been flooded by Irondequoit Creek. The fish hatchery area has been flooded as a result of large quantities of water run-off coming down the gully to the east of the hatchery. This run-off is compounded by drainage from development to the east and south.

Ellison Park is subjected to several periods of flooding every year. This flooding is primarily of the flash type flood resulting from heavy rainfall up stream or from rapid melting of snow. Unfortunately, the change in elevation from the low areas in Ellison to the Bay and Lake is so slight that run-off is delayed particularly during periods when the Lake level is high.

Ellison Park is a much favored recreation area by residents of Monroe County. It contains many ball fields, tennis courts and picnic areas. Large group picnics are planned for the area. Upon several occasions each year it has been necessary to cancel out scheduled events because of high water conditions. As the water recedes it leaves behind deposits of soil as well as debris. The deposited soil must be cleaned off of tennis court, road and parking lot surfaces, off of restroom floors and in case of exceptionally high water off of building floors. Lawn areas also must be taken care of by clean up and in some cases by reseeding. The inconvenience rendered to people who have scheduled events which have to be cancelled because of flash flooding cannot be measured.

At Powder Mills Park, the effects are nowhere near as great as they are at Ellison; however, upon several occasions there has been a loss of trout at the fish hatchery when flood water has caused holding areas to overflow.

The Department of Parks Monroe County is in full agreement with many items stated in the P.O.S.. It realizes that new facilities should be developed and located out of the flooding areas. It has been involved in a land acquisition program which has resulted in the addition of new land to Ellison Park in areas which lie above the flood plain. The Park Department has also resorted to some regulations of the use of existing facilities in an effort to avoid the inconvenience caused for people when events must be cancelled. The Department realizes that it is difficult to change human behavior relative to the use of park areas but it is willing to formulate new patterns of use which may be better suited to the environmental conditions. The provision of hiking, nature, bicycle and canoe trails within the areas under County jurisdiction is a wise use of those lands subject to flooding and from an economic viewpoint is the most prudent use of this land.

Because of the low altitude of much of the Ellison Park land, all flooding of the area can probably not be prevented. Flood walls and levees which may be a solution during periods of high water and great run-off may also serve to remove much of the land from traditional use during the rest of the year. If possible this department would favor any diversion measures which could be developed particularly if flood waters could be diverted away from the heavily used areas in Ellison Park.

The Department of Parks Monroe County will be pleased to cooperate wherever possible in the development of the final Plan of Study and in any actual development which will result in benefit to the general public.

Very truly yours,

Alvan R. Grant

Alvan R. Grant
Director of Parks

ARG:hs

New York State Department of Environmental Conservation
P.O. Box 57, Route 20, Avon, N.Y. 14414

Peter A. A. Berle
Commissioner

Irwin H. King,
Regional Director

September 3, 1976

Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineer
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, N.Y. 14207

Re: DEC No. 828-99-0080
Draft Plan of Study for
Irondequoit Creek and
tributaries for
Flood Control & Allied
Purposes, Monroe County

Dear Colonel Ludwig:

Thank you for the opportunity to review the above referenced Plan of Study. Following are our comments reflecting this Department's interests which should receive consideration in future reports.

A rainbow and brown trout fishery exists in Irondequoit Creek and a number of its tributaries. Natural spawning brown trout are located in Irondequoit Creek and its tributaries upstream from Route 96. High quality fisheries exist in tribs #29, #30, and #31. Downstream areas may be able to support natural populations of brown trout when sewage discharges and other environmental disturbances are fully controlled. Irondequoit Creek receives a Lake Ontario rainbow trout run. The potential exists for a rainbow nursery upstream from Route 96 to Trout Brook. The ability of this species to reproduce in the stream is under investigation by our Region 8 Fisheries Unit.

Wetland areas protected by the Environmental Conservation Law are located throughout the watershed. This Department expects to complete an inventory of the protected areas within 18 months. Significant wildlife values are associated with the undeveloped flood plain of Irondequoit Creek and its tributaries. These areas should be protected from disturbance and should receive recognition in future environmental reports. Structural protection of the flood plain could lead to development in this area thus removing valuable wildlife habitat.

Fish & Wildlife resource specialists from this Department are available to assist in identifying resources in a specific area. Contact for such assistance should be established through Mr. Edward Holmes, Supervisor of Fish & Wildlife, in this office.

The effect of this proposal on forestry resources and other plant life should be stated in future environmental reports.

Although there appears to be no conflict with this Department's Pure Waters program, the Corps should be aware of the presence of a major interceptor sewer in the Irondequoit Creek valley.

The Corps should maintain contact with the Region's Flood Control unit. Requests should be directed to Mr. Allan Buddle, Senior Hydraulic Engineer, at the Elmira Flood Control office, 180 State Street, Elmira, N.Y., 14901, phone 607-734-6289.

It appears that the application of non-structural measures to alleviate flood problems may have a positive impact on natural resources. Action in this direction at this time could minimize the need for structural measures at a later date. It is recommended that this approach to the problem be pursued without delay.

As an outcome of the Corps meeting with local town officials on August 24, 1976, at the Brighton Town Hall, it was suggested that a steering committee be formed comprised of town officials and the Monroe County Department of Planning. This Department has an interest in working closely with all parties which may be affected by the proposal. Mr. Edward Holmes will be able to assign a representative to participate in future committee meetings as a member of the steering committee.

We appreciate the opportunity to comment in more detail when the specific proposed actions are finally reported.

Sincerely yours,

Irwin H. King

IHK: evb

c: Edward Holmes
John Aughenbaugh, Monroe Co. Dept. of Planning
Elmer Wagner
Allan Buddle

TOWN of HENRIETTA

475 CALKINS ROAD • HENRIETTA NEW YORK 14467 • TELEPHONE 334-7700

JOHN E KELLY
Supervisor

KEITH C MURPHY
Town Clerk

CARL B SWEIMAN
LAWRENCE B KOHSMAN
MICHAEL J MURPHY
DAVID H MAILLIE
Councilmen

August 23, 1976

Daniel D. Ludwig
Colonel, Corp of Engineers
District Engineer
1776 Niagara Street
Buffalo, New York 14207

Re: Comments on Draft Plan of Study - Irondequoit Creek Watershed,NY.

Dear Colonel:

We have reviewed the above mentioned Plan of Study and have several comments concerning our portion (Henrietta) of the study area.

We found that approximately one-half of the 1960 flood damages occurred in the Allen Creek area, of which our Town is a part (Area 11, Plate 3). We are very interested in seeing this area protected from any flooding in the future since the development is quite dense. We strongly suggest that structural alternatives be given prime consideration for future flood control. As we have learned in Henrietta (Red Creek Flood Plain), non-structural alternatives such as flood insurance and flood plain regulation can produce undesirable side effects. The stigma of <u>another</u> flood plain in our Town would promote potential blight areas and reduce the chances of orderly development.

In short, we are very much in favor of flood control in a realistic sense. Simply to make people aware of potential dangers, and not to take structural corrective action, serves little purpose. We do feel that a flood warning system would be better than doing nothing, but we concur with your analysis of this alterrative as a poor one.

Thank you for the opportunity to comment, we appreciate the effort involved in such a study. We are looking forward for further reports on this subject.

Very truly yours,

John E. Kelly
Supervisor

xcs: H. Corneles
File

Printed on recycled paper

NEW YORK STATE PARKS & RECREATION Agency Building 1 Empire State Plaza Albany New York 12238 Information 518 474 0456
Orin Lehman, Commissioner

RE: NCBED-PN
Irondequoit Creek Study
August 12, 1976

August 19, 1976

Department of the Army
Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Attention: Daniel D. Ludwig
Colonel, Corps of Engineers
District Engineer

Dear Colonel Ludwig:

Commissioner Lehman wishes to thank you for the opportunity to review the Draft Plan of Study for Flood Control and allied purposes in the Irondequoit Creek Watershed.

This office has reviewed the indicated study at the Commissioner's request and feels the purpose and scope insofar as it effects the Office of Parks and Recreation is particularly well planned and to which we have no objections.

Improvements to the watershed should do nothing except improve the water quality of Irondequoit Bay where we have considerable interest.

Sincerely,

James J. O'Brien
Director
Division of Marine & Recreational Vehicles

JJO:AG:js

County of Monroe

NEW YORK

DEPARTMENT OF PLANNING
301 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

DON B. MARTIN, DIRECTOR

TELEPHONE
(716) 428-5481

August 17, 1976

Mr. Thomas P. Ryan, Mayor
City of Rochester
34 City Hall
Rochester, New York 14614

Dear Mr. Ryan:

The Army Corps of Engineers, Buffalo district, has recently completed a Plan-Of-Study for the Irondequoit Creek watershed. During the next several years, the Corps will study the flooding process in the watershed, its present and potential future effects on lands adjacent to the creek, and alternative solutions to alleviate the negative effects of periodic flooding along Irondequoit Creek and its tributaries.

In order to facilitate the study process, the Army Corps has requested the assistance of the Monroe County Department of Planning in calling together a preliminary working session of the supervisors and the mayors of the affected towns and villages in this two county watershed.

The purpose of this working session is twofold. First, the Corps representative associated with this plan-of-study (William Zeller-Study Manager, Charles Baldi-Assistant Chief of Planning, Ken Orth-Environmental Planning, and Dan Kelly-Chief of the New York Basin Area) will briefly describe the history of the project to date and will outline the Corp's policies relative to flood control alternatives. Secondly, the Corps' representatives will seek the assistance of those present in identifying both the specific flooding problem areas in their communities and the extent of their community's needs for some form of flood management and control.

Therefore, I hope that you or your representative will be able to attend this meeting to be held on Tuesday, August 24, at 7:30 P.M. in the supervisor's office at the Brighton Town Hall--2300 Elmwood Avenue, Brighton, New York. We look forward to seeing you there.

Sincerely,

Don B. Martin
Director of Planning

DBM:jb
xc: Lucien A. Morin, County Manager
U.S. Representative Frank J. Horton
William Zeller, Corps of Engineers

Organized 1796

Town of Pittsford

MONROE COUNTY

11 SOUTH MAIN STREET, PITTSFORD, N.Y. 14534

PHONE 586-8640

August 16, 1976

Daniel H. Ludwig
Colonel, Corps of Engineers
District Engineer
Department of The Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel:

I am very sorry that I will not be able to meet with the Corps representatives at Brighton Town Hall on the 24th. This is a night of the Town Board meeting and we have hearings that have been advertised and things of that nature so that there is no way to postpone the meeting.

However, Mr. Kassel our Director of Public Works, or his assistant Timothy Downing will be at the meeting and will be able to participate in moving things forward.

Your letter of the 12 of August sparked a thought in my mind which I would like to mention to you.

Here in Pittsford, as you know, there is the great embankment of the canal which has worked heretofore as a pretty much ever flowing detention pond. It occurs to me that as a part of the engineering study, that it would be possible for the Corps of Engineers to recommend utilizing the Irondequoit Valley between the great embankment of the Canal and the Powder Mills Park as a giant detention pond. For the most part development has been kept out of this Valley and it is possible that some of the lower lying homes on a couple of our residential streets could actually be removed or protected so that this Valley could be used as an enormous reservoir for bad situations.

It is just a thought and it may have no merit, but perhaps, also, there is a possibility here.

Sincerely,

Paul M. Spiegel
Supervisor
TOWN OF PITTSFORD

PMS/bh
cc: Al Kassel
Tim Downing

County of Monroe

NEW YORK

DEPARTMENT OF PLANNING
301 COUNTY OFFICE BUILDING
ROCHESTER, NEW YORK 14614

DON B. MARTIN, DIRECTOR

TELEPHONE:
(716) 428-5461

June 16, 1976

Colonel Bernard Hughes
Buffalo District
U.S. Army Corps of Engineers
17[illegible] Niagara St.
Buffalo, NY 14207

Subject: Review of draft Plan of Study: Irondequoit Creek, New York and tributaries, including Allen Creek, for flood control and allied purposes.

Dear Colonel Hughes,

The Monroe County Department of Planning has reviewed the above mentioned draft Plan of Study. We welcome the Corps' intention to intensively study the Irondequoit Creek watershed by identifying specific problems and potential solutions for alleviating the current and future flooding hazards in this area.

We are very much concerned, however, as to whether the basic thrust of the st , both in terms of its scope of work and the coordination and policy formulation structure, reflects the following principles, which we believe the Plan of Study should incorporate. These are (1) that a floodplain management approach should be the preferred long-range solution to the problem of flooding in the watershed; and (2) that policy decisions regarding flood control measures should be made by a policy committee made up of local officials representing the several local and county government jurisdictions in the watershed. We believe that if these principles serve as the foundation of the Corps' study there will be much greater chance that the final recommendations of the study will receive local acceptance.

Throughout the study process, the Corps should work from the policy premise that Irondequoit Creek and its tributaries are natural stream bodies that should remain that way. Some development has been allowed to occur in flood-prone areas in isolated sections so that the flooding problems are fairly localized and most of the stream corridor remains in a near natural state. The proposal to protect Irondequoit Creek as a linear park is found in town, county and regional plans. In this regard, the linear park concept is generally compatible with periodic flooding since little or no property damage occurs along the undeveloped portions of the stream and its tributaries. The Irondequoit Creek watershed is one of the

most intensively planned areas in Monroe County and each of the Monroe County towns in the watershed has recently completed master plans with policy recommendations concerning protection of Irondequoit Creek. In addition, most have enacted land use controls designed to implement such policies. We point this out to show that there has been much continuing local concern and action to protect Irondequoit Creek and to control land use in the watershed. This previous activity in no way detracts from the need for a watershed approach to drainage and flood control problems such as the Corps study proposes. However, we would like to see the extensive municipal planning already accomplished in the watershed (1) become integrated into the Corps' proposed plan of study, and (2) serve as a frame of reference for the Corps' flood management plan. In this way, the Corps study and plan would be compatible with local policies and thereby enhance its prospects for local acceptance. The comprehensive floodplain management approach is not stressed in the plan of study. Yet, in our view, it offers the best promise for a positive long-range, as well as least cost solution to the flooding issue; it is also most compatible with the above stated natural stream protection policy position. The floodplain management technique, in part, calls for municipalities to restrict intensive development in areas subject to flooding and to encourage non-intensive low investment use of the floodplain.

We recognize, of course, that flood waters respect no political boundaries, and so, if floodplain management is to be successful, it must be adhered to on a regional or watershed basis. Nevertheless, we view the floodplain management approach is primarily a local management problem with primary responsibility for implementation residing at the local level. The Corps can provide the necessary expertise to develop the guidelines and management objectives to be carried out by the various municipalities and two counties in this watershed. Therefore, not only should the Corps develop a detailed data base, but it should identify the specific problem areas and design the floodplain management approach most appropriate for resolving each of the problem areas. In this context, the Corps would serve as the technical staff and consultant to the local policy committee. This technique was used and worked very well in the development of the Irondequoit Bay Plan whereby the County Planning staff served as the technical staff for the Irondequoit Bay Policy Committee comprised from the four towns adjacent to the Bay as well as the City of Rochester.

To deal with these major concerns, we therefore recommend that the Corps:

(1) revise the proposed plan of study to emphasize the long-range floodplain management approach, with the underlying philosophy that natural solutions, including prevention, are preferable and less costly than structural ones;

(2) have the planning process focus on specific problem areas but always within the context of the total watershed and the system-wide effects of particular floodplain management techniques; and

(3) retain the proposed public hearings and 'workshops as deemed necessary' approach, but replace it as the primary instrument for local coordination by establishing a locally based policy committee consisting of town supervisors as well as appropriate city and county representatives and with Corps personnel serving as a technical resource staff to the Policy Committee. This Policy Committee should be set up at the earliest possible date in this planning process, to ensure that the process is indeed a local effort which will reflect the views and concerns of the local population.

We thank you for the opportunity to comment on this draft and wish to assure you that we will cooperate to the fullest extent in making this study serve local needs and interests.

Sincerely,

Don B. Martin
Director of Planning

DBM/TAP/mm

xc: Congressman Frank Horton
Lucien Morin, County Manager
Tom Mooney, Deputy County Manager
Martin Foos, Chairman Monroe County Planning Board
George Gardner, Chairman Monroe County Planning Council
Donald Deming, Supervisor, Town of Irondequoit
Irene Gossin, Supervisor, Town of Penfield
Richard Wiles, Supervisor, Town of Brighton
Paul Spiegel, Supervisor, Town of Pittsford
Lake Edwards, Supervisor, Town of Perinton
Squire Kingston, Supervisor, Town of Mendon
John Kelly, Supervisor, Town of Henrietta
Peter McDonough, Mayor, Village of Fairport
David Shepherd, Mayor, Village of Pittsford
Anthony Della Pietra, Mayor, Village of East Rochester
Thomas Ryan, Mayor, City of Rochester
Robert Collins, Director, M.C. Environmental Management Council
Reviewer

June 14, 1976

Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Attention: Lt. Col. Walker

Re: Irondequoit Creek Draft Plan of Study

Name: Dr. Kirby M. Milton
309 Fishers Road
Fishers, New York 14453

I also own a residence at 374 Fishers Road, which property extends to the center of Irondequoit Creek. I am a past chairman of and present member of the Town of Victor Planning Board having served for eight years. I am representing only myself tonight, however, because the Draft Plan of Study arrived less than two weeks ago and there was no time for our Planning Board to discuss it.

Irondequoit Creek has had a history of flooding since this land was first settled. The serious damage which has occurred in recent times, however, has involved recent developments built in areas of the creek historically subject to flooding.

I would object to the building of flood control dams in the upper Irondequoit basin - particularly anywhere along the creek in Ontario County - as was once proposed in an earlier study of about 1966-1967. The area in Ontario County is almost the only natural area of the stream left. It serves as an important recreational and wildlife area and a fishery and spawning area for brook, brown and rainbow trout.

I also object to the expenditure of public funds to protect development which has recently and knowingly taken place in the flood basin.

If there is a desire to expend public funds to alleviate future flood problems, the money might be better spent in an area not covered in the current Plan of Study. Broad as this study is, it does not look beyond the flood hazard areas or floodways for solutions to the problem. Yet the real long term answer to prevent future floods, far worse than any yet experienced, is to prevent the development of and draining of areas now serving as natural holding areas for run-off, (for example, the cedar swamps

near Victor), and to prevent any upstream development in the entire watershed from increasing either the amount of or rate of run-off over that currently occurring. I feel this is a serious omission and should be considered in the Plan of Study.

As a member of a planning board, we are continually frustrated in our attempts to control development in such areas. We have already had proposals in Victor which, if permitted, would overnight outdate the maps in the present Plan of Study. We need help to control the development in these areas draining into the designated flood areas just as much as the recently received help to control development in the flood hazard areas themselves. I feel it more important to acquire land, easements, development rights or whatever in these former areas than to acquire them along the stream itself. The monies would be better spent for these purposes than in building dams.

I would also like to add, however, that public ownership per se is no assurance that flooding problems will be controlled and not made worse by use. I would ask you to study the character of Irondequoit Creek in Ellison and Powder Mills Parks, for example, and compare to that of the stream in the Fishers area which is still in private ownership to see which you feel contributes more to flooding problems.

Thank you.

Kirby M. Milton

Kirby M. Milton

cc: Victor Planning Board

FINAL FEASIBILITY REPORT

IRONDEQUOIT CREEK WATERSHED
NEW YORK

APPENDIX H
SECTION 404 EVALUATION/AND BIOLOGICAL STUDIES AND COORDINATION ACT REPORT

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

FINAL

SECTION 404 EVALUATION
FLOOD PROTECTION
IRONDEQUOIT CREEK, MONROE COUNTY
NEW YORK

1. Project Description.

1.1 Introduction. Section 404 Discharges - Section 404 of the Clean Water Act (33 USC 1344), requires the evaluation of the water quality effects of the disposal of dredged or fill materials into navigable waters of the United States. This preliminary evaluation for the proposed Irondequoit Creek, Flood Control Project, has been prepared using the general guidance contained in EC 1105-2-97 dated 8 May 1979 "Implementation of the Clean Water Act," and is being coordinated with the public in conformance with guidance contained in NCDPD-ER letter dated 4 September 1979, "Public Coordination of Section 404(b)(1) Evaluations on Civil Works Projects."

1.2 Selected Plan. The proposed flood protection alternative, Alternative B, for Panorama Plaza and adjacent areas, in the town of Penfield, Monroe County, NY, involves dredging and bank sloping as well as the placing of stone fill (riprap and bedding material) and sheet piling. This evaluation will address the probable physical and biological impacts of this action upon the project area. Alternative B requires work to be performed both in Irondequoit Creek and Allen Creek which is a tributary of Irondequoit Creek. (Reference Plate 5 Final Feasibility Report)

1.3 Characteristics, Quantities and Source of Materials. Irondequoit Creek flows through an alluvial flood plain. The alluvium is composed primarily of fine sands which make up the majority of the banks and bottom materials. Allen Creek is currently downcutting through a glacial terrace. The terrace generally is composed of gravelly sand with cobbles reaching a maximum size of 6 inches in diameter.

Irondequoit Creek will require excavation of approximately 3,200 cubic yards of sandy bank and bottom material and, placement of approximately 393 cubic yards of stone riprap and bedding material. Allen Creek will require approximately 15,200 cubic yards of gravelly, cobbly bank, and bottom material to be excavated and, installation of 1,564 cubic yards of stone riprap and bedding material, as well as 1,136 square feet of steel sheet piling for a channel drop structure.

The riprap and bedding material probably will be provided from nearby quarries. These quarries currently produce from the Lockport Formation which is a dolostone (rock type).

1.4 Site Description and Location. The areas of bank modification and riprap filling along Irondequoit Creek will occur on the left and right banks, both up and downstream, at both the Penfield Road Bridge and Old Penfield Road Bridge. The proposed modification will result in approximately eight 25-foot long sections of bank being graded to a 1 on 2.5 slope and then lined with stone riprap. Additionally, two areas just downstream of the Old

Penfield Road Bridge will also be graded to a 1 on 2.5 slope and riprapped. These areas to be graded and riprapped will be approximately 520 feet of right bank, as viewed looking downstream, from survey station 54+00 to 59+20, and approximately 150 feet of left bank, as viewed looking downstream from survey station 53+00 to 54+50.

1.5 Allen Creek. Allen Creek, a tributary of Irondequoit Creek, will be modified to include a 3-foot high drop structure constructed of sheet piling, located 850 feet upstream of the confluence of Allen and Irondequoit Creeks. This would be installed across the creek to dissipate energy and reduce creek velocities. Since velocities will still be erosive during high flows, the entire channel from the confluence of Irondequoit and Allen Creeks upstream to the drop structure must be dredged and riprapped to further reduce water velocity. The intent of dredging is to cut the existing channel bottom grade down to an elevation that matches the bottom elevation of the proposed drop structure.

In addition, from the confluence, to a point 400 feet upstream, the new channel would be aligned along the existing channel. The channel in this reach would meander and pools would be established in the location of the present pools. The riprap would be placed in such a manner to create a rough channel to create riffle zones. Continuing another 500 feet upstream, the channel would be realigned in a westerly direction to allow for sufficient room to construct a levee along the east bank. The channel would be constructed along a meandering alignment and have pools with riffle zones. Also, a low flow channel would be installed along the entire length of Allen Creek. (Reference Plate 5 Final Feasibility Report)

1.6 Method of Discharge. The actual methods of discharge will be determined at the time of construction. The proposed work is usually performed by utilizing a backhoe and bulldozer. The bulldozer would be used to shape and slope the banks as well as grade the stone riprap. Stone would be trucked in to the project site. The backhoe would be used to do the major channel modifications and shape the low flow channel. Any material dredged from either Irondequoit or Allen Creeks will be trucked to a New York State Department of Environmental Conservation (NYSDEC) approved upland disposal site (not a wetland). This dredged material will not re-enter any navigable waters of the United States, and therefore, is not applicable for evaluation under 404 and will not be considered further.

1.7 Timing of Discharge. The actual year of project construction cannot be determined due to uncertainty of Congressional authorization and funding. However, to minimize the impacts of discharges on the known fishery of Irondequoit Creek, no discharges will be made during the spring or fall seasons of the year. There are no documented significant fish spawning or migrations activities for Allen Creek in the project area. However, to prevent increased siltation and turbidity downstream in Irondequoit Creek, which could interfere with documented salmonid migrations, no work will be performed during the spring and fall seasons. Coordination with the Fish and Wildlife Service (FWS) and (NYSDEC) will be maintained to identify expected migration period ranges prior to construction.

1.8 Projected Life of the Discharge Site. The construction of the new channel and placement of riprap will be a one-time occurrence, except for occasional maintenance. These discharges and the use of the sites will occur only at the time of construction and is designed for a 50-year life. Any material removed during the operation and maintenance portion of the project will be disposed of in an approved NYSDEC upland disposal site.

2. Physical Effects.

2.1 Effects on Wetlands. The proposed discharges will have no effect on wetlands currently existing in the project area. (Reference Section 4 in EIS).

2.2 Effects on the Water Column.

2.2.1 Light Transmission - The placement of stone riprap will temporarily cause increased turbidity silt and sediment suspension, which will reduce light transmission in the water column. Although temporary reduction in light penetration may have some short-term impact on aquatic life forms (i.e. phytoplankton) in the water column, the effect is not expected to be significant. This impact should only last during construction and for a short period of time after construction is completed, (until turbidity dissipates and settles out). Placement of the sheet piling drop structure should have similar effects.

2.2.2 Aesthetics - Existing creek water color during and immediately after construction would be altered toward a murkier shade until turbidity subsided. After construction is completed creek banks and some channel bottom zones in the project area would have a man-made appearance due to bank and channel shaping and placement of stone. Eventually, disturbed soils on creek banks above water will become established with vegetation (both natural and planted) and aquatic plants may colonize some water areas in the channel which would help mitigate construction appearance to some degree. Also, some weed plants will probably invade some riprap crevices where wind-blown or water deposited soils collect. The sheet pile structure across Allen Creek would create a low waterfall zone, but some of the piling would still be visible.

2.3 Effects on Benthos. This project will result in the covering of approximately 35,240 square feet of creek bottom and bank resulting in loss of existing benthos. The introduced riprap would provide more stable habitat for benthos in lieu of exposed more erodible sandy banks. The total quantity of riprap and bedding stone added will be approximately 1,958 cubic yards which would cover the existing benthos. Increased submerged surface area created by placement of stone along the channel bottom and below water on bank slopes, would provide benthic habitat for eventual reinvasion and establishment of benthic organisms.

Although 900 feet of Allen Creek bottom will be dredged and riprapped, resulting in loss of benthos, this impact should not be significant since there are still large quantities of the original similar habitat both upstream and downstream of the project area.

2.4 Physical Changes.

2.4.1 Irondequoit Creek will experience only minor physical changes. Sandy bank areas 25 feet above and below the Penfield and Old Penfield Road Bridges will be replaced with stone riprap placed on a 1 on 2.5 foot slope. These areas are from survey station 59+38 to 59+63 (right and left bank) and from survey station 58+59 to 59+20 (right and left banks). In addition, two bank areas downstream from the Old Penfield Road Bridge will be riprapped - 1 on 2.5 slope. These areas are from survey station 54+00 to 59+20 (right bank) and from survey station 53+00 to 54+50 (left bank).

2.4.2 Allen Creek - A 3-foot drop structure (constructed of sheet piing) will be located 850 feet upstream of the confluence and would dissipate energy and reduce velocities slightly. The velocities would vary from 8.8 fps at the drop structure to 3.5 fps near the confluence. The velocities would still be highly erosive, and the entire length of the channel (900 feet) would require riprap along the bottom and sides. The channel would have a 30-foot bottom width with 1 to 2.5 sideslopes and would cut a gradient to match the bottom elevation at the 3-foot drop structure. From the confluence, to a point 400 feet upstream, the new channel would be aligned along the existing channel. The channel in this reach would meander and pools would be established in the location of the present pools. The riprap would be placed in such a manner to create a rough channel with riffle areas. Continuing another 500 feet upstream, the channel would be realigned westerly to allow sufficient room to construct a levee along the east bank. The channel would be constructed along a meandering alignment and have pools with riffle areas. A low-flow channel would be installed along the entire length of the Allen Creek rechannelization. The riprap would aid in making the low-flow channel more permanent.

3. Chemical-Biological Interactive Effects.

3.1 Exclusion Criteria Determination. The various approaches for testing the chemical-biological interactive effects of the discharge of dredged and fill materials are outlined in 40 CFR 230.4-1(b)(2) and (3). Dredged or fill materials may be excluded from further biological and chemical testing if any of "exclusion criteria" as defined in 40 CFR 230.4-1(b)(1)(i), (ii), or (iii) are met. Briefly summarized, these exclusion criteria are (i) that the dredged material is composed predominately of sand, gravel, or any other naturally occurring sedimentary material with particle sizes larger than silt, usually found in high energy environments; (ii) that the material is suitable and being used for beach nourishment; and (iii) that the material proposed for discharge is primarily the same as at the proposed discharge site. This final criteria requires that the dredged material is sufficiently removed from sources of pollution to provide reasonable assurances that the material is not polluted from such sources, and that adequate conditions are provided in the disposal method to provide reasonable assurance that the discharged material will not be moved by currents or otherwise in a manner that is damaging to the environment outside the disposal area.

3.2 The proposed flood control project at Irondequoit Creek will place stone riprap, bedding stone, and sheet piling into the creeks. Such stone and sheet piling are basically inert materials and seem to meet the exclusion criteria defined in 40 CFR 230.4-1(b)(1)(i).

4. Site Comparison (40 CFR 230.4-1(c)).

4.1 Sediment and Biological Analysis. The dredged material as previously mentioned will be disposed of upland and is excluded from 404 evaluation but, since this stream is experiencing improved water quality conditions and has the potential for salmonid spawning, an elutriate test was performed (see Appendix H - Biological Studies). This test was run as a precaution to determine whether or not harmful toxins may be resuspended into the water column of the project area. The test results showed heavy metal and pesticide levels were lower than the Federal National Interim Primary Drinking Water Standards, therefore, no special measures would have to be considered by the Corps.

5. Water Quality Considerations.

5.1 Fill and Disposal Operations. Since the material to be used as fill meets exclusion criteria (40 CFR 230.4-1(b)), no further testing will be conducted. Dredged material will be disposed of on an upland area and therefore is excluded from 404 evaluation.

5.2 The project will unavoidably cause increased turbidity and resuspension of some bottom material, due to spill over when dredging occurs. These impacts are anticipated to be minor and should dissipate after construction is completed.

5.3 Water Quality Certificates. As stated in NYSDEC letter dated 6 August 1979 (on file at the Buffalo District Office), whenever NYSDEC is a local cooperator on flood control projects, they waive the necessity for requiring a 401 Water Quality Permit.

6. Selection of Discharge Sites.

6.1 Introduction. The criteria to be used in determining the selection of disposal sites for dredged and fill materials to be placed in waters of the United States are defined in 40 CFR 230.5. The various criteria and their relationship to the proposed project for Irondequoit Creek are discussed in the following paragraphs.

6.2 Need for the Proposed Activity. Irondequoit Creek has had a recorded history of flooding. Due to continued urbanization and encroachment into the flood plain this flooding has resulted in increased economic damages. Corps of Engineer planning investigations into this flooding problem have determined that it is economically and environmentally feasible and in the best interest of the local public, to construct a flood control project along Irondequoit and Allen Creeks in the Panorama Plaza area.

6.3 Alternative Sites and Methods of Discharge. The Irondequoit Creek Study, during the Final Feasibility Stage, investigated a number of possible plans and sites which called for creek modifications along Irondequoit and Allen Creeks. The results of the planning effort concluded that the sites in Alternative B are the best sites to be modified (Plate 5) to meet the objectives of the study, namely, flood damage reduction.

6.4 Disposal Methods. Actual disposal or filling methods will not be known until the time of construction, but it will be required that the dredged material be disposed of on an upland area.

6.5 Objectives in Discharge Determinations. The general objectives to be considered in designating a discharge site for dredged or fill materials are defined in 40 CFR 230.5(a)(1) to (8). These objectives summarized, state that discharge activities should avoid: (1) significant disruptions to the chemical, physical, and biological integrity of the aquatic ecosystem; (2) significant disruptions to the food chain; (3) significant disruptions to the movement of fauna into and out of breeding, feeding, and nursery areas; (4) destruction of wetlands; (5) disruption of areas that serve to contain flood waters; (6) significant increases in turbidity; (7) severely affecting aesthetic, recreational, and economic values; and (8) avoid degradation of water quality as specified in 40 CFR 230.4, and 230.5(c) and (d). In addition this action will have no significant adverse effects on diversity of plant and animal species, or Rare and Endangered species.

6.6 The proposed flood protection project at Irondequoit Creek as described in the Final Feasibiltiy Report, Draft Environmental Impact Statement and this Preliminary Section 404 Evaluation, all indicate that this project meets the aforementioned objectives in Section 6.5.

6.7 Impact on Water Uses at Proposed Discharge Site. Impacts along Irondequoit and Allen Creeks caused by the introduction of riprap and sheet piling are addressed in the following paragraphs:

6.7.1 Municipal Water Supply - There are no water intakes within the project area, therefore no significant impacts are anticipated.

6.7.2 Shellfish - There are no significant fresh water shellfish reported within the project area. Therefore, no significant impacts are anticipated.

6.7.3 Fisheries

a. The Biological Survey Report for Irondequoit Creek project indicated that there is only a limited permanent resident fish population present in the study area and the fishery of the project locale is a succession of species migrating through the area. Therefore, to reduce impacts, construction will be timed not to interfere with spring or fall migrations. With this consideration, adverse impacts to the fishery are anticipated to be temporary and minor in magnitude.

b. The area of Allen Creek will have man-made pools incorporated into the new channel. This modification should be beneficial to fish in the creek by creating zones of deeper water.

6.7.4 Wildlife - No significant impacts on wildlife are expected to occur. Some wildlife may be displaced from the area during actual construction, but should return after construction is completed and vegetation plantings become established.

6.7.5 Recreation - The project area is not significantly used by recreationalists and therefore, the proposed discharge activities will have no significant impacts.

6.7.6 Threatened and Endangered Species - Although the project area is within the general range of certain protected species, the likelihood of finding such species within the project area, other than as transients, is very low. Therefore the proposed discharges should have no significant effect on threatened or endangered species or their critical habitats as defined in the Endangered Species Act.

6.7.7 Wetlands - The proposed discharges will have no effect on existing wetlands within the project area. (Reference Section 4 EIS).

6.7.8 Benthic Life - The discharges will inevitably cover some existing benthic life. Biological studies of the area show that benthic invertebrate species composition is common of creeks located within the watershed. The addition of more stable stone provided by riprap will increase the submerged surface area of the creek which should eventually provide habitat on the stone and among rock crevices for possible recolonization of benthic organisms.

6.7.9 Submerged Vegetation - Aquatic plants are nearly nonexistent in the potential project site in Irondequoit Creek and were not found to exist in the study area in Allen Creek. Impacts are anticipated to be negligible to aquatic vegetation.

6.7.10 Size of Disposal Area - The size and quantity of material (stone and sheet piling) to be placed in Irondequoit and Allen Creeks is the minimum necessary to provide flood protection (a 500-year flooding event) and erosion protection to existing bridges, properties and proposed flood proofing structures.

6.8 Considerations to Minimize Harmful Effects. All appropriate considerations to minimize the harmful effects of the disposal of dredged or fill materials as defined in 40 CFR 230.5(c)(1-7) associated with the Irondequoit Creek flood control project have been considered in specifying the proposed disposal sites. These considerations, as summarized, include 40 CFR 230.5(c)(1) water quality criteria; (2) alternatives to open-water disposal; (3) physical characteristics of alternative disposal sites; (4) ocean dumping; (5) covering contaminated material with clean material; (6) minimize runoff from confined areas on the aquatic environment; and, (7) coordination of potential monitoring activities with EPA.

7. Use of Materials From a Land Source and Mixing Zone Determination.

7.1 40 CFR 230.5(d) prohibits the discharge of fill materials from a land source when these materials are contaminated. The only land source materials to be discharged in Irondequoit Creek are relatively inert, stone and sheet piling. These materials wil be used in the construction of a drop structure, channel bottom and new banks.

7.2 The mixing zone has been determined to be the smallest practicable area within each specified disposal zone, consistent with the objectives of the project and guidelines set down in 40 CFR 230.

8. Conclusion and Determinations.

8.1 I have reviewed the documents pertinent to the construction of a flood control project at Irondequoit Creek, Monroe County, NY, and have concluded that:

8.1.1 An ecological evaluation has been performed following the evaluation guidance contained in 40 CFR 230.4, in conjunction with the evaluation considerations in 40 CFR 230.5 (40 CFR 230.3(d)).

8.1.2 Appropriate measures have been identified and incorproated into the proposed plan to minimize adverse effects on the aquatic environment as a result of the discharge (40 CFR 230.3(d)(1)).

8.1.3 Consideration has been given to the need for the proposed activity, the availability of alternative sites and methods of disposal that are less damaging to the environment, and such water quality standards as are appropriate and applicable by law (40 CFR 230.5).

8.1.4 No wetlands will be adversely affected by construction of this project.

9. Findings. I find that the placement of approximately 1,958 cubic yards of stone and 1,136 square feet of sheet piling, in the form of riprap and a steel drop structure respectively, have been specified through applications of Section 404(b)(1) of the Clean Water Act guidelines and applicable Corps of Engineers Regulations. Therefore, my determination is that this project is in the best public interest and should be constructed.

Date 6/16/81

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

Biological Studies of Irondequoit and Allen Creeks in Penfield, New York 1979-1980

By

Dr. Andrew M White

Dr. Norman A. Alldridge

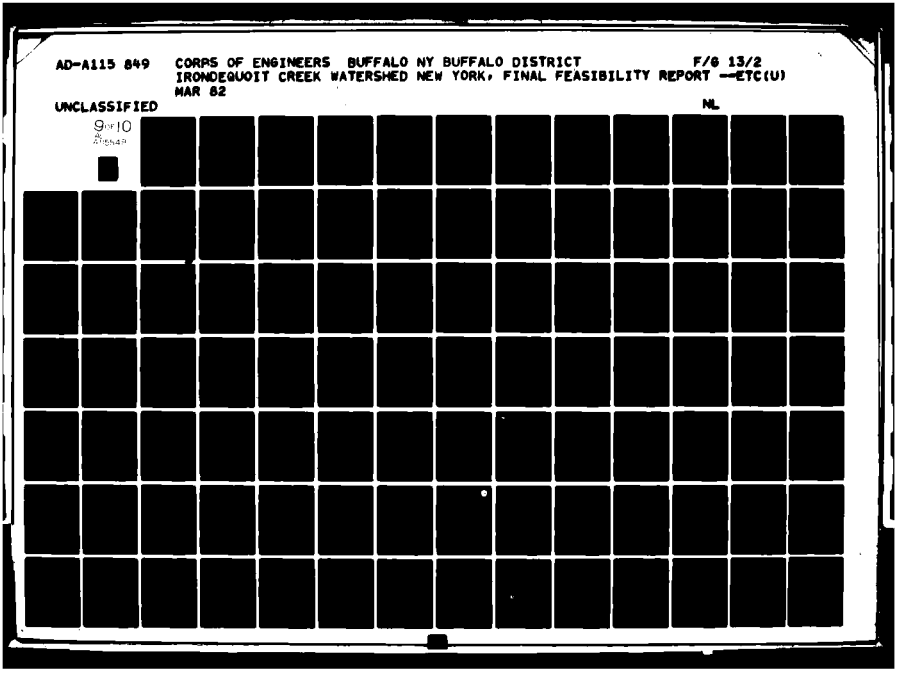
Environmental Resource Assoc.
20700 North Park Blvd.
University Heights, Ohio
44118

Contract DACW49-79-C-0085

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED NL

9 OF 10
AD
A115849



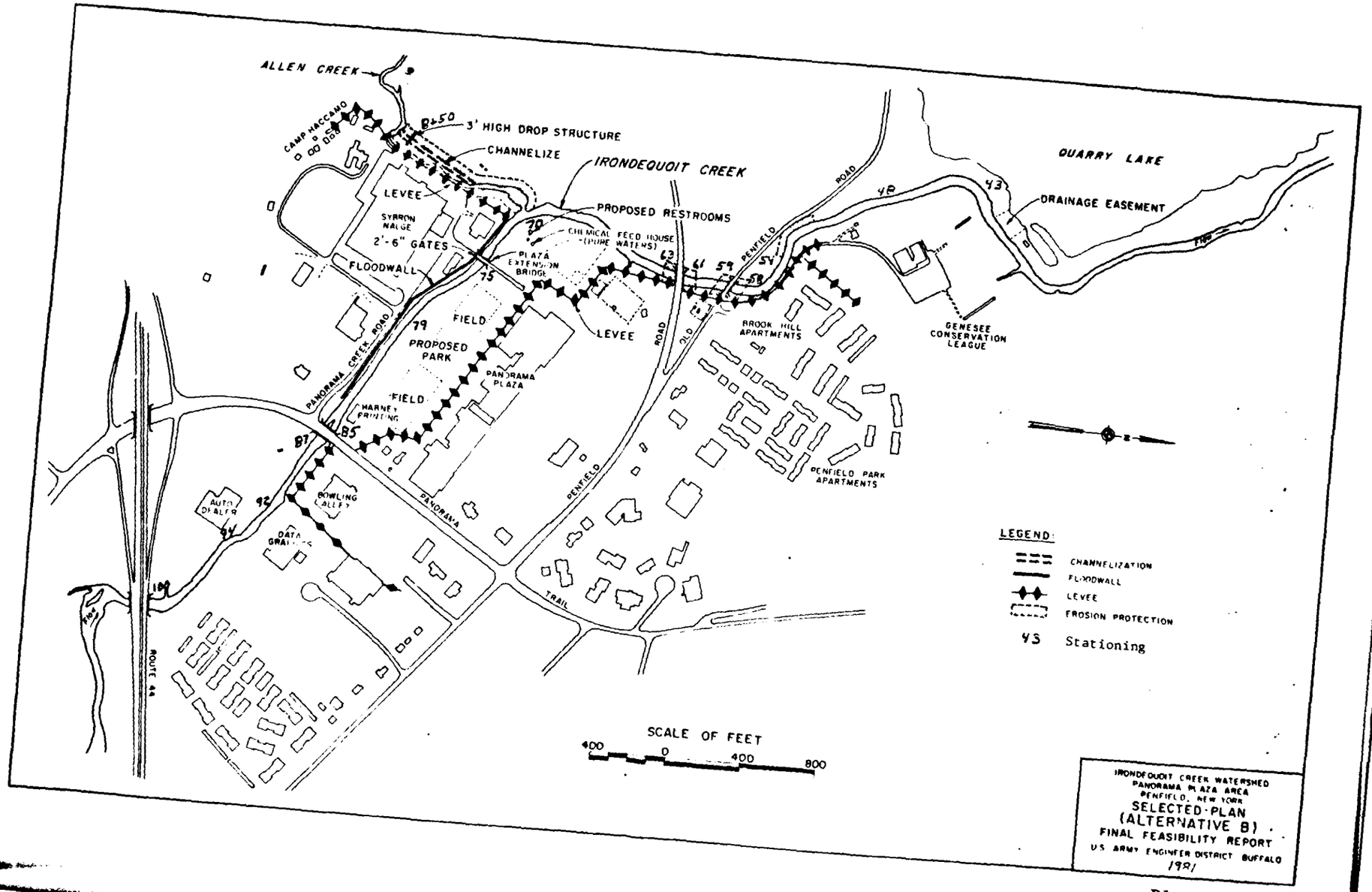

ALLEN CREEK
CAMP HACCAMO
3' HIGH DROP STRUCTURE
CHANNELIZE
IRONDEQUOIT CREEK
PROPOSED RESTROOMS
LEVEE
SYRON NALGE
2'-6" GATES
FLOODWALL
CHEMICAL FEED HOUSE (EQUIPMENT WATERS)
PLAZA EXTENSION BRIDGE
FIELD
PROPOSED PARK
PANORAMA PLAZA
FIELD
HARNEY PRINTING
PANORAMA CREEK ROAD
PENFIELD ROAD
BROOK HILL APARTMENTS
GENESEE CONSERVATION LEAGUE
QUARRY LAKE
DRAINAGE EASEMENT
PENFIELD PARK APARTMENTS
AUTO DEALER
BOWLING ALLEY
DATA GRAPHICS
PANORAMA
TRAIL
ROUTE 441
LEGEND:
CHANNELIZATION
FLOODWALL
LEVEE
EROSION PROTECTION
43 Stationing
SCALE OF FEET
400 0 400 800
IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
SELECTED PLAN
(ALTERNATIVE B)
FINAL FEASIBILITY REPORT
U.S. ARMY ENGINEER DISTRICT BUFFALO
1981

Plate 5 (404)

Biological Studies on Irondequoit Creek
Penfield, New York

Investigations of the biological conditions existing at the Irondequoit Creek study area were conducted during three periods, 9-11 November, 1979 and 22-24 May / 20-23 June, 1980. All samples and observations were made in accordance with the scope of work as defined in Contract DACW49-79-C-0085. Sample sites were located as defined in the scope of work and by discussion with US Army Corps of Engineers personnel. Figure 1 illustrates the location of each of the five study sites. A description of each of these locations is as follows:

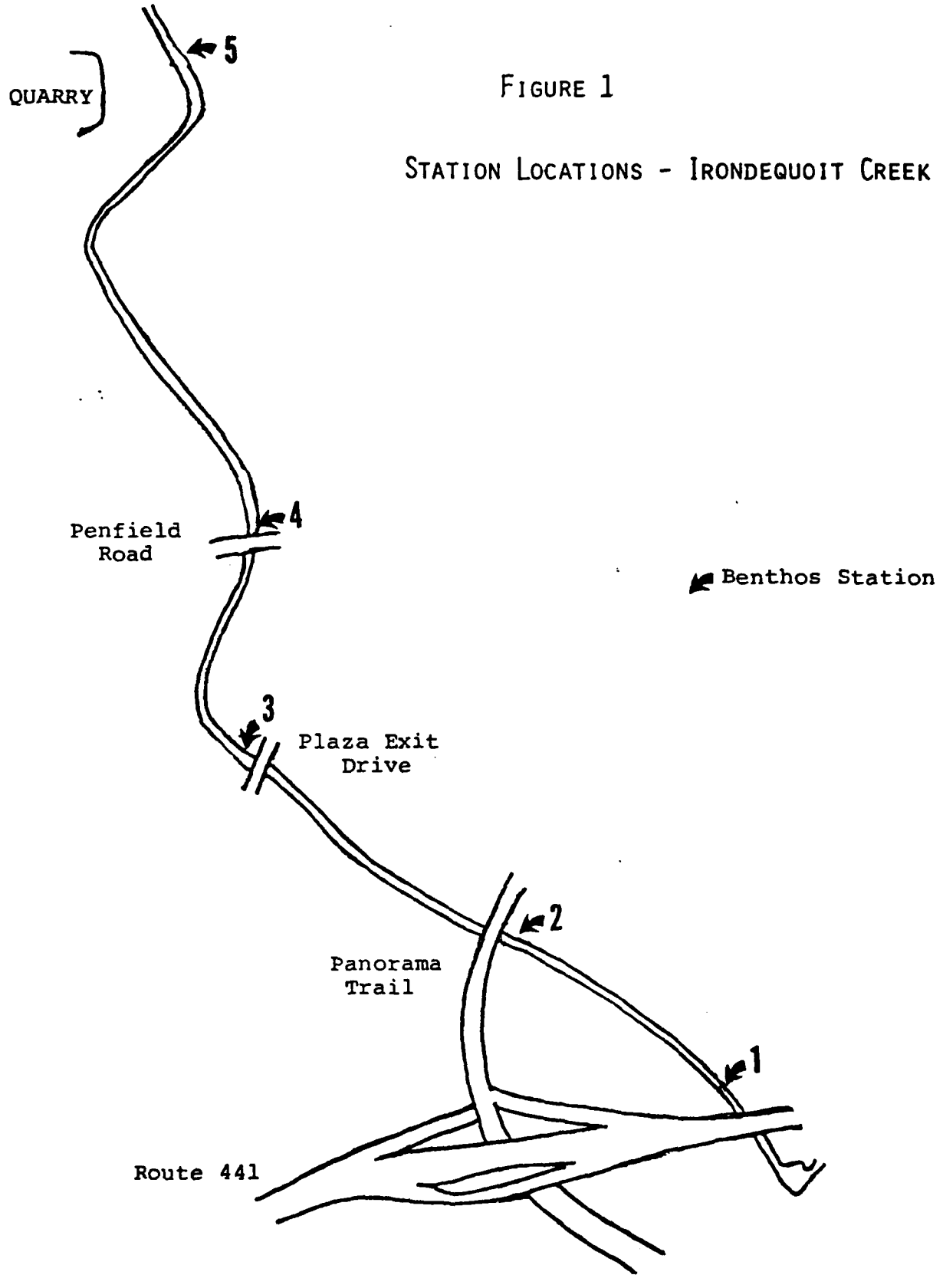
Site 1:

Irondequoit Creek at Route 441. This site consisted of the stream reach from a large pool upstream of the Route 441 bridge to an area approximately 100 yards downstream. The site included a pool with a maximum depth of five feet and a diameter of fifty-five feet; a riffle system containing both bedrock and cobble substrates, an area of moving waters 2 - 3 feet deep with substrates of shifting silty sands; and a tributary (2-3 feet wide) which entered just downstream of the riffle system.

Water chemistry samples were collected from the center of the study area, 75 feet downstream of the riffle system. Benthos samples were collected from an area within the riffle system and from the silted sands of the area downstream. Fisheries samples were taken from the entire

FIGURE 1

STATION LOCATIONS - IRONDEQUOIT CREEK



area, including pools, riffles and shallows downstream to the upper limit of Station 2.

Site 2:

Irondequoit Creek at Panorama Drive. This site included a uniform habitat of slowly to moderately moving waters over substrates of very silty sands and coarse gravels. In general the area contains little habitat diversity, little substrate variability and no bank cover or vegetation which will afford fishery cover. Water chemistry samples and benthos samples were collected from an area slightly upstream of the Panorama Drive bridge. Fishery samples were collected from the entire area, from the lower limit of Station 1 to the upper limit of Station three.

In general this area is almost completely canopied, and exhibits depths of 2-3 feet. Riparian woodland reaches the stream edge in most areas. Limited amounts of rooted aquatics, *Potomogeton pectinatus*, were present near the bridge.

Site 3:

Irondequoit Creek at the Plaza Exit Bridge. This area is primarily an extension of the habitat present at site two. Substrates, depths and canopy were identical with the exception of a riffle system and deep (4-6 ft.) area at the downstream limit of the site. Minimal amounts of bank cover were available and even less aquatic vegetation was present. Water chemistry samples were collected at an area a few feet downstream of the Plaza Exit bridge, and fishery samples were taken from the entire area.

Site 4:

Irondequoit Creek at Penfield Road. Again, this area was uniform and exhibited little habitat diversity. No undercut banks or extensive areas of deadfall were present and the substrates were uniformly a silted coarse gravel and sand. Water flow was moderate in all areas and depths were uniformly 2-4 feet. No vegetation was present, a complete canopy covers the area and no pools were available throughout the area.

Water chemistry samples were collected from an area under the Penfield Road bridge as were the benthic samples. Fisheries samples were collected throughout the area, from the lowermost extent of site three to an area 200 feet downstream of the Penfield Road bridge.

Site 5:

Irondequoit Creek near the sand quarry. Water flow at this station is somewhat swifter than at all other sites but riffles and pools are not present. Currents are contained in what appears to be a formerly channelized area of stream, moving the course of the stream around the quarried areas. Depths were consistantly 3 - 4 feet andsubstrates consisted of cobble and gravels. Bank cover was non-existant.

Benthos samples were taken in an area slightly upstream of the upper limit of the quarry area and water chemistry samples were collected from a point just upstream of the benthos collection area. Fisheries samples were collected throughout a 300 foot section of this uniform habitat. The area was principally open, with little canopy and areas of aquatic vegetation were present.

Streambanks were vegetated with terrestrial grasses and areas of horsetail, *Equisetum arvense*.

Methods:

Fisheries collections were made with gear appropriate for individual stream sections and habitats encountered. Seines were used at all locations (6, 16 and 26 ft.) as a routine method. A 50 ft. bag seine was employed in the large pool at site one. Traps and short-term gillnet samples were collected at sites three, four and five and electroshocking gear was utilized at all sites. Larval and fry stages of fishes were collected using fine-mesh nets. These were returned to the laboratory for identification. Adult fishes were released after examination with the exception of those few retained for taxonomic verification. These latter were preserved on-site in 6% formalin.

Benthic organisms were collected with a dredge in those areas where soft substrates were present, and with a Surbus Samples in rocky riffles. Collections were screened, sorted and preserved in the field. These were returned to the laboratory where they were sorted and classified to the lowest practical taxonomic units.

Water quality parameters were taken with the aid of field meters for Oxygen, pH and Temperature. Free carbon dioxide measurements were made in accordance with method # 111B, Examination of Water and Wastewaters, 13th ed. 1971, "Titrimetric method for free carbon dioxide: Field Procedure." Chemical parameters were measured before legal sunrise and during mid-day on each sample date.

Birds were identified in the field by both direct observation and by song. Nests were located and when possible, these were identified. Mammal populations

were examined both through direct trapping of small forms and by indirect techniques such as tracks, signs and dens. All sites were examined and mammals of the fields and/or riparian woodlands within 200 ft. of the stream were evaluated.

Aquatic vegetation, amphibians and reptiles were noted as encountered during other field activities. No special effort was expended on surveys of these organisms. Vegetation observed was collected and returned to the laboratory for identification. Only one aquatic species was recorded from all these collections.

Spawning activity of salmonids was censused by direct observation. Nest-building activity was observed and documented by excavation of certain areas of activity. Collecting for larval salmonids was undertaken with fine-mesh seines and by excavation of former nest sites. No larval forms were recorded from any of the spawning locations. Young salmonids were not collected during any of the routine fisheries samplings. It is assumed that spawning occurs but success is negligible or non-existant.

TABLE 1

FISHERY COLLECTIONS 9 - 11 NOVEMBER
IRONDEQUOIT CREEK

SITE 1

		COLLECTED	TOTAL WEIGHT
Chinook Salmon	*Oncorhynchus tshawytscha*	1	40.0 lb
Rainbow Trout	*Salmo gairdneri*	9	18.0 lb
Northern Pike	*Esox lucius*	1	.5 lb
White Sucker	*Catostomus commersoni*	12	8.2 lb
Blacknose Dace	*Rhinichthyes atratulus*	3	< .1 lb
Bluntnose Minnow	*Pimephales notatus*	2	< .1 lb
Creek Chub	*Semotilus atromaculatus*	1	< .1 lb
Common Shiner	*Notropis cornutus*	8	< .2 lb
Green Sunfish	*Lepomis cyanellus*	3	.1 lb
Yellow Perch	*perca flavescens*	1	< .1 lb

SITE 2

Rainbow Trout	*Salmo gairdneri*	1	2.2 lb
White Sucker	*Catostomus commersoni*	11	5.8 lb
Green Sunfish	*Lepomis cyanellus*	2	< .1 lb

SITE 3

White Sucker	*Catostomus commersoni*	1	.3 lb
Green Sunfish	*Lepomis cyanellus*	3	< .2 lb
Yellow Perch	*Perca flavescens*	1	< .1 lb

SITE 4

Chinook Salmon	*Oncorhynchus tshawytscha*	1	23.0 lb

SITE 5

None Collected

Results:

Fisheries

In considering the results of the fishery collections we must conclude that Irondequoit Creek is an area of temporary residence for nearly all species present. These individuals enter the study area either to spawn or while enroute to spawning areas upstream of the study area. Most individuals of salmonids, catostomids and basses enter the study area during the appropriate spawning period and leave soon thereafter. Thus, with the exception of a few resident sunfishes and minnows, the fishery of Irondequoit Creek exhibits a series of immigration and emmigration of the major sport species and rough fishes.

During the period of investigation, these movements were first noticed in late fall. Large numbers of salmon and trout were reported by local fishermen during late September and October. By November, small numbers of adult salmon were present as were slightly larger numbers of brown and rainbow trout. Of interest, Table 1, is the nearly complete lack of redhorse, suckers, carp and smallmouth. Large schools of native minnows were not present, nor were other expected species such as the white perch or goldfish. No young of the year individuals were collected during this period, indicating that these, too, had emmigrated to areas downstream of the study location.

By spring, the salmon and larger brown trout were no longer present. Rainbow trout had entered the area, in April and early May, and were nearly gone by late May. Fishermen reported that some walleye were taken in the stream in early May but none were collected during the sample period, (note that one young walleye was collected in June). While virtually no suckers were taken in fall, the spring collections contained many redhorse and white

suckers, Tables 2 and 3. White perch were also present in fairly large numbers as were spottail shiners. It becomes highly probable that these fishes were migrants from downstream areas, and considering the species involved, (white perch, silver redhorse and northern redhorse) it is highly probable that these were from Lake Ontario. It is also interesting to note that the suckers were spawning only at site one in Irondequoit Creek, while most of the adults were collected in Allen Creek, a much smaller stream. It is probable that Irondequoit Creek is serving primarily as a route for migration to smaller tributaries in the area.

By June, Table 4, most of the catostomids had left the study area, carp were still present and spottail shiners were increasingly abundant. Smallmouth bass were present as larger individuals and rockbass were more abundant than in previous collections. Trout of lengths more than 8 inches were not collected and it is assumed that the larger adults of all salmonids had left the area. White perch were very abundant and a single walleye was captured in the pool at station 1.

An examination of all specimens captured during the three sample periods indicated that almost no juvenile fishes were taken. With the exception of a few sunfish juveniles and young yellow perch. This seems to confirm the conclusion that the area is used primarily as a spwaning ground, a migration route or a nursery for fry but not as a permanent habitat for adults or juveniles.

The physical condition of many of the fishes collected was also of considerable interest. Nearly all of the carp and many of the white suckers exhibited considerable damage to the pectoral and pelvic fins as well as to the

TABLE 2

FISHERY COLLECTIONS 22-24 MAY
IRONDEQUOIT CREEK

		COLLECTED	TOTAL WEIGHT
SITE 1			
Rainbow Trout	*Salmo gairdneri*	1	.75 lb
White Sucker	*Catostomus commersoni*	5	2.50 lb
Spottail Shiner	*Notropis hudsinius*	6	< .1 lb
Creek Chub	*Semotilus atromaculatus*	1	.1 lb
Black Bullhead	*Ictalurus melas*	1	.2 lb
White Perch	*Morone americanus*	18	2.2 lb
Rockbass	*Ambloplites rupestris*	2	.3 lb
Bluegill	*Lepomis macrochirus*	1	.1 lb
Yellow Perch	*Perca flavescens*	2	.1 lb
SITE 2			
Brown Trout	*Salmo trutta*	1	1.6 lb
Rainbow Trout	*Salmo gairdneri*	1	.8 lb
Northern Pike	*Esox lucius*	1	.6 lb
White Sucker	*Catostomus commersoni*	4	3.8 lb
Carp	*Cyprinus carpio*	11	28.6 lb
Goldfish	*Carassius auratus*	1	.7 lb
Spottail Shiner	*Notropis hudsonius*	12	.3 lb
Common Shiner	*Notropis cornutus*	3	< .1 lb
Rockbass	*Ambloplites rupestris*	1	.2 lb
Pumpkinseed Sunfish	*Lepomis gibbosus*	2	.1 lb
Yellow Perch	*Perca flavescens*	6	.3 lb

TABLE 2 CONTINUED

FISHERY COLLECTIONS 22-24 MAY

		COLLECTED	TOTAL WEIGHT
SITE 3			
Rainbow Trout	*Salmo gairdneri*	1	< .1 lb
Northern Pike	*Esox lucius*	1	.6 lb
White Sucker	*Catostomus commersoni*	9	8.4 lb
Carp	*Cyprinus carpio*	5	8.1 lb
Smallmouth Bass	*Micropterus dolomieui*	1	.6 lb
Bluegill	*Lepomis macrochirus*	1	< .1 lb
SITE 4			
White Sucker	*Catostomus commersoni*	7	6.3 lb
Golden Redhorse	*Moxostoma erythrurum*	1	1.4 lb
Carp	*Cyprinus carpio*	4	6.2 lb
Rockbass	*Ambloplites rupestris*	2	< .1 lb
SITE 5			
White Sucker	*Catostomus commersoni*	19	18.0 lb
Carp	*Cyprinus carpio*	16	38.4 lb
Goldfish	*Carassius auratus*	1	.4 lb
Common Shiner	*Notropis cornutus*	23	---
Smallmouth Bass	*Micropterus dolomieui*	1	.6 lb
Bluegill	*Lepomis macrochirus*	2	< .2 lb

TABLE 3

FISHERY COLLECTIONS - ALLEN CREEK

22-24 MAY

		COLLECTED	TOTAL WEIGHT
Brown Trout	*Salmo trutta*	2	1.2 lb
Rainbow Trout	*Salmo gairdneri*	2	.75 lb
Northern Pike	*Esox lucius*	1	.5 lb
White Sucker	*Catostomus commersoni*	51	42.0 lb
Shorthead (northern) Redhorse	*Moxostoma Macrolepidotum*	1	1.3 lb
Golden Redhorse	*Moxostoma erythrurum*	2	2.1 lb
Black Redhorse	*Moxostoma duquesnei*	7	6.6 lb
Silver Redhorse	*Moxostoma anisurum*	16	12.5 lb
Carp	*Cyprinus carpio*	8	20.8 lb
Common Shiner	*Notropis cornutus*	6	< .2 lb
Creek Chub	*Semotilus atromaculatus*	39	< .2 lb
Bluntnose Minnow	*Pimephales notatus*	86	< .1 lb
Longnose Dace	*Rhinichthys cataractae*	2	< .1 lb
Blacknose Dace	*Rhinichthys atratulus*	16	< .2 lb
Brown Bullhead	*Ictalurus nebulosus*	1	.3 lb
White Perch	*Morone americanus*	1	.1 lb
Smallmouth Bass	*Micropterus dolomieui*	8	2.4 lb
Rockbass	*Ambloplites rupestris*	4	< .2 lb
Bluegill	*Lepomis macrochirus*	2	< .1 lb
Pumpkinseed	*Lepomis gibbosus*	1	< .1 lb
Yellow Perch	*Perca flavescens*	1	< .1 lb
Tesselated x Johnny Darter	*Etheostoma olmstedi X nigrum*	1	< .1 lb

TABLE 4

FISHERY COLLECTIONS 20-23 JUNE 1980

IRONDEQUOIT CREEK

		COLLECTED	TOTAL WEIGHT
SITE 1			
Northern Pike	*Esox lucius*	1	.76 lb
White Sucker	*Catostomus*	2	1.4 lb
Carp	*Cyprinus carpio*	1	3.4 lb
Spottail Shiner	*Notropis hudsonius*	15	< .2 lb
Creek Chub	*Semotilus atromaculatus*	1	.1 lb
White Perch	*Morone americanus*	13	1.9 lb
Smallmouth Bass	*Micropterus dolomieui*	1	.8 lb
Rockbass	*Ambloplites rupestris*	2	.3 lb
Pumpkinseed Sunfish	*Lepomis gibbosus*	4	.4 lb
Walleye	*Stizostedion v. vitreum*	1	.8 lb
Yellow Perch	*Pe-ca flavescens*	6	.4 lb
SITE 2			
White Sucker	*Catostomus commersoni*	7	5.8 lb
Golden Redhorse	*Moxoxtoma erythrurum*	1	1.1 lb
Silver Redhorse	*Moxostoma anisurum*	1	1.6 lb
Carp	*Cyprinus carpio*	4	9.7 lb
White Perch	*Morone americanus*	11	1.1 lb
Rockbass	*Ambloplites rupestris*	2	.2 lb
SITE 3			
Northern Pike	*Esox lucius*	1	.4 lb
White Sucker	*Catostomus commersoni*	6	4.8 lb
Silver Redhorse	*Moxostoma anisurum*	3	1.9 lb
Golden Redhorse	*Moxostoma erythrurum*	1	.8 lb
Carp	*Cyprinus carpio*	3	2.6 lb
Smallmouth Bass	*Micropterus*	1	.4 lb

TABLE 4 CONTINUED

FISHERY COLLECTIONS 20-23 JUNE 1980

IRONDEQUOIT CREEK

		COLLECTED	TOTAL WEIGHT	
SITE 4				
White Sucker	*Catostomus commersoni*	8	5.3	lb
Carp	*Cyprinus carpio*	3	6.2	lb
Goldfish	*Carassius auratus*	1	.6	lb
Smallmouth Bass	*Micropterus dolomieui*	1	.4	lb
Rockbass	*Ambloplites rupestris*	2	< .1	lb
Pumpkinseed Sunfish	*Lepomis gibbosus*	1	< .1	lb
Yellow Perch	*Perca flavescens*	8	.3	lb
SITE 5				
White Sucker	*Catostomus commersoni*	14	12.8	lb
Silver Redhorse	*Moxostoma anisurum*	2	3.4	lb
Spottail Shiner	*Notropis hudsonius*	86	.8	lb
Common Shiner	*Notropis cornutus*	39	.2	lb
White Perch	*Morone americanus*	17	1.3	lb
Smallmouth Bass	*Micropterus dolomieui*	2	.7	lb
Rockbass	*Ambloplites rupestris*	1	.2	lb

TABLE 16

21 JUNE - BENTHIC COLLECTIONS

gill filaments. Many individuals had fins which were reduced nearly to "stumps" with distorted rays. These conditions suggest that they were migrants from some area of heavy chemical pollution. Redhorse suckers did not exhibit these damages nor did the white perch, bass or salmonids. It is assumed that these were from populations from Lake Ontario.

Descriptions of the stream previously presented also shed light on the results of these fishery collections. Throughout the entire study area only two riffles exist and not a single quite, deep pool. Three small areas approach pool form but they are only 4-6 ft deep and have a moderate current. Nearly all (95% +) of the available habitat consists of shallow (1-2 ft) depths, no bank cover or deadfall, no aquatic vegetation, a moderate current and substrates of sand, silt and coarse gravels with no rocks or boulders. Quite simply, the stream affords little food, almost no cover and no deep pools for adult game fishes.

These results demonstrate that the fishery of Irondequoit Creek is a succession of species, migrating through the area. Sport fishing in the stream is seasonal and consists of a series of species for limited periods of time.

Salmonid Spawning

Observations and collections during both the fall and spring have documented spawning activity of chinook salmon, rainbow trout and brown trout. Redds were constructed at two locations; in and below the riffle system at station 1, and near the mouth of Allen Creek in the center of Station 3. While spawning activity was observed, and eggs were laid, subsequent investigations were unable to document any reproductive success. No

yolk sac or larval salmonids were collected in the study area even though considerable effort was expended seining with fine-mesh seines and excavating in areas of known spawning activity. It would appear that heavy siltation of the gravels and the scouring activity of the stream during repeated floodings has prevented the hatching of those eggs laid.

It must be stated, however, that the upper reaches of Station one and the riffle system at the lower end of Station 3 near the mouth of Allen Creek have potential for the successful reproduction of both brown trout and rainbow trout. Should stream conditions improve, we would expect that successful production of these two species would occur.

Benthic Populations

Samples of benthic invertebrates taken in Irondequoit Creek indicate a paucity of individuals and a lack of species richness (diversity). Tables 5 - 19 generally indicate this poor diversity and lack of individuals. It is probable that the lack of habitat diversity and the continual siltation and/or shifting of the substrated contributes to this lack of a viable, productive benthic fauna. The almost total lack of aquatic vegetation also contributes to the lack of benthos.

The lack of this important food source for the fishery probably contributes to the lack of several segments of the natural fish fauna. Darters (etheostomas) would be expected on the riffles at site 1, but none were collected. Since many of the common darters and minnows feed on Trichopterans and mayflies, the absence of these becomes easier to understand.

TABLE 5

9 NOVEMBER - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 1
PENFIELD, NEW YORK

TAXON	NO./ SQ. METER	
	RIFFLES	POOL
Oligochaeta	9322	37556
Isopoda		
Asellus sp.	11	-
Hirudinea	22	44
Insecta		
Diptera		
Orthocladiinae	33	-
Chironominae	122	-
Mollusca		
Gastropoda		
Lymnaea sp.	-	44
Gyraulus sp.	-	44
Goniobasis sp.	22	-
Pelecypoda		
Pisidium sp.	-	88

TABLE 6

9 NOVEMBER - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 2
PENFIELD, NEW YORK

TAXON	NO./ SQ. METER	
	SILTED SAND	SILTED SAND
Oligochaeta	9067	6333
Isopoda		
Asellus sp.	533	44
Hirudinea	11	-
Insecta		
Trichoptera		
Hydroptila sp.	333	44
Diptera		
Orthocladiinae	11	-
Chironominae	-	44
Tanypodinae	22	22
Mollusca		
Gastropoda		
Lymnaea sp.	44	-
Physa sp.	44	44
Gyraulus sp.	44	-
Viviparus sp.	-	22
Ferrissia sp.	767	600
Pelecypoda		
Pisidium sp.	11	-

TABLE 7

9 NOVEMBER - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 3
PENFIELD, NEW YORK

TAXON	NO./ SQ METER	
	SILTED SAND	ORGANIC SAND
Oligochaeta	856	1555
Turbellaria		
Dugesia sp.	-	11
Isopoda		
Asellus sp.	11	11
Insecta		
Trichoptera		
Hydroptila sp.	11	-
Diptera		
Chironominae	-	55
Mollusca		
Gastropoda		
Physa sp.	11	22
Gyraulus sp.	-	33
Lymnaea sp.	-	22
Goniobasis sp.	11	-
Ferrissia sp.	22	22
Pelecypoda		
Pisidium sp.	11	-

TABLE 8

9 NOVEMBER - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 4
PENFIELD, NEW YORK

TAXON	NO./SQ. METER MUD/GRAVEL	MUD/GRAVEL
Oligochaeta	67	94
Isopoda		
Asellus sp.	-	11
Insecta		
Trichoptera		
Hydropsyche sp.	22	-
Mollusca		
Gastropoda		
Ferrissia sp.	-	44
Physa sp.	11	55
Lymnaea sp.	22	89
Gyraulus sp.	-	78
Pelecypoda		
Sphaerium sp.	-	22

TABLE 9

9 NOVEMBER - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 5
PENFIELD, NEW YORK

TAXON	NO./ SQ. METER	
	MUD	SILTED RIFFLE
Oligochaeta	633	38487
Isopoda		
Asellus sp.	622	-
Amphipoda		
Gammarus sp.	44	-
Hirudinea	33	-
Insecta		
Trichoptera		
Hydropsyche sp.	89	-
Diptera		
Orthocladiinae	33	-
Chironominae	11	1385
Mollusca		
Gastropoda		
Ferrissia sp.	33	-
Physa sp.	22	-
Gyraulus sp.	-	44

TABLE 10

23 MAY - BENTHIC COLLECTIONS

IRONDEQUOIT CREEK - STATION 1
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER RIFFLE	POOL
Oligochaeta	4117	5171
Isopoda		
Asellus sp.	43	-
Insecta		
Tricoptera		
Hydropsyche sp.	7	-
Hydroptila sp.	43	-
Coleoptera		
Hyperodes sp.	4	-
Diptera		
Simulidae (type A)	108	-
Simulidae (type B)	32	-
Chironominae	43	376
Orthocladiinae	2526	806
Tanypodinae	11	-
Dipteran pupa	914	366
Other		
Fish eggs	4	11

TABLE 11

23 MAY - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 2
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER SILTED	SAND	SILTED	SAND
Oligochaeta	9762		10792	
Isopoda				
Asellus sp.	-		860	
Insecta				
Trichoptera				
Hydroptila sp.	-		344	
Diptera				
Simulidae	44		1032	
Orthocladiinae	2968		2264	
Dipteran pupa	216		9288	
Mollusca				
Gastropoda				
Lymnaea sp.	86		-	
Ferrissia sp.	130		172	
Pelecypoda				
Sphaerium sp.	-		516	
Other				
Fish larvae *	44		172	

* See Fisheries Report

TABLE 12
23 MAY - BENTHIC COLLECTIONS
IRONDEQUIOT CREEK - STATION 3
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER SILTED SAND	ORGANIC SAND
Oligochaeta	5676	10622
Amphipoda		
Gammarus sp.	86	-
Insecta		
Diptera		
Chironminae	216	172
Orthocladiinae	732	430
Dipteran pupa	44	44
Mollusca		
Gastropoda		
Physa sp.	86	130
Gyraulus sp.	-	216
Helisoma sp.	-	130
Goniobasis sp.	-	86
Planorbula sp.	-	560
Ferrissia sp.	216	1076
Pelecypoda		
Sphaerium sp.	216	1076

TABLE 13

23 MAY - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 4
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER MUD/GRAVEL	MUD /GRAVEL
Oligochaeta	*3741*	*1097*
Isopoda		
Asellus sp.	*65*	*22*
Insecta		
Trichoptera		
Hydroptila sp.	*22*	-
Diptera		
Orthocladiinae	*258*	*387*
Chironominae	*43*	-
Dipteran pupa	*129*	*86*
Gastropoda		
Ferrissia sp.	*194*	-
Pleurocerca sp.	-	*22*
Gyraulus sp.	-	*43*
Pelecypoda		
Sphaerium sp.	*65*	*22*

TABLE 14

24 MAY - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 5
PENFIELD, NEW YORK

TAXON	NO./ SQ. METER MUD	SILTED RIFFLE
Oligochaeta	1269	41345
Isopoda		
Asellus sp.	-	882
Amphipoda		
Gammarus sp.	-	215
Arachnida		
Hydracarina	-	22
Insecta		
Ephemeroptera		
Baetis sp.	-	258
Pseudocloen sp.	-	43
Trichoptera		
Hydroptila sp.	-	1762
Cheumatopsyche sp.	-	22
Hydropsyche sp.	-	65
Leucotrichia sp.	-	43
Coleoptera		
Stenelmis sp.	11	-
Hyperodes sp.	11	-
Diptera		
Simulidae (type A)	-	1355
Simulidae (type B)	-	86
Orthocladiinae	247	15416
Chironominae	32	43
Dipteran pupa	43	4730
Mollusca		
Gastropoda		
Gyraulus sp.	22	-
Physa sp.	43	-
Ferrissia sp.	54	43
Goniobasis sp.	11	-
Planorbula sp.	11	-
Helisoma sp.	11	-
Pelecypoda		
Sphaerium sp.	129	-
Other		
Fish eggs	22	86

TABLE 15
21 JUNE - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 1
PENFIELD, NEW YORK

TAXON	NO./ SQ. METER RIFFLE	POOL
Oligochaeta	505	7385
Isopoda		
Asellus sp.	355	118
Decapoda		
Orconectes sp.	-	11
Insecta		
Ephemeroptera		
Baetis sp.	5	-
Trichoptera		
Hydroptila sp.	86	22
Hydropsychidae pupa	5	-
Coleoptera		
Stenelmis sp.	-	11
Diptera		
Diptera pupa	54	-
Orthocladiinae	258	75
Chironominae	-	22
Mollusca		
Gastropoda		
Helisoma sp.	5	-
Valvata sp.	5	-
Viviparus sp.	-	32
Pelecypoda		
Sphaerium sp.	5	11

TABLE 16

21 JUNE - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 2
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER	
	SILTED SAND	SILTED SAND
Oligochaeta	1080	1801
Isopoda		
Asellus sp.	38	124
Amphipoda		
Gammarus sp.	5	27
Insecta		
Ephemeroptera		
Baetis sp.	-	5
Trichoptera		
Hydroptila sp.	5	27
Lepidoptera		
Parapoynx sp.	5	-
Coleoptera		
Stenelmis sp.	5	-
Diptera		
Diptera pupa	16	81
Simulium (type A)	-	38
Simulium (type B)	-	70
Chironominae	11	65
Tanypodinae	-	5
Orthocladiinae	27	1188
Mollusca		
Gastropoda		
Ferrissia sp.	5	-
Physa sp.	-	16
Helisoma sp.	-	5
Pelecypoda		
Sphaerium sp.	5	11

TABLE 17

21 JUNE 1980 - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 3
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER	
	SILTED SAND	ORGANIC SAND
Oligochaeta	274	199
Amphipoda		
Gammarus sp.	5	-
Insecta		
Trichoptera		
Hydroptila sp.	11	16
Diptera		
Chironominae	11	5
Orthocladiinae	5	11
Mollusca		
Gastropoda		
Physa sp.	5	5
Pelecypoda		
Sphaerium	32	-

TABLE 18

21 JUNE 1980 - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 4
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER MUD/GRAVEL	MUD/GRAVEL
Oligochaeta	75	22
Isopoda		
Asellus sp.	16	5
Insecta		
Diptera		
Diptera pupa	11	-
Orthocladiinae	-	16
Chironominae	22	5
Mollusca		
Gastropoda		
Viviparus sp.	32	-
Helisoma sp.	22	5
Physa sp.	22	16
Valvata sp.	5	-
Goniobasis sp.	5	5
Ferrissia sp.	5	-
Pelecypoda		
Sphaerium sp.	32	22

TABLE 19

21 JUNE 1980 - BENTHIC COLLECTIONS
IRONDEQUOIT CREEK - STATION 5
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER MUD	SILTED RIFFLE
Oligochaeta	591	946
Hirudinea	22	-
Isopoda		
Asellus sp.	1236	5
Amphipoda		
Gammarus sp.	5	-
Insecta		
Ephemeroptera		
Baetis sp.	22	-
Trichoptera		
Hydroptila sp.	129	22
Leucotrichia sp.	5	-
Hydropsyche sp.	16	-
Cheumatopsyche sp.	5	-
Hydropsychidae pupa	11	-
Coleoptera		
Stenelmis sp.	5	-
Diptera		
Diptera pupa	32	-
Simulium (type A)	5	-
Simulium (type B)	5	-
Orthocladiinae	613	22
Chironominae	16	27
Mollusca		
Gastropoda		
Ferrissia sp.	16	75
Valvata sp.	5	-
Physa sp.	-	11
Goniobasis sp.	-	5
Pelecypoda		
Sphaerium sp.	5	16

Aquatic Macrophytes

The area of Irondequoit Creek under investigation is nearly all conopied by a thin strip of riparian woodland. As a result of the lack of sunlight, lack of quiet shallows and the constantly shifting substrates, rooted aquatic plants are nearly non-existant. Small patches of yellow sweet flag are present on the stream edge at stations 1, 2 and 5 but none of these cover areas more than 15 square feet. No cattail margins exist and no typical marsh areas are present.

Sites one, two and five exhibit limited areas of *Potomogeton pectinatus* growths. These are restricted to areas which comprise less that 5% of the total habitat available. No rare or endangered macrophytes were observed in the stream.

It should be noted that two areas within the study zone contain plants of interest. The first is an area within the riparian woodland adjacent to site 4. In this location, an extensive growth of Ostrich Fern exists. At site three, the open meadow contains a damp area where several species of rushes and sedges are growing. Should these species be considered of value, stream modification might be mitigated to consider these two areas of interest.

Bird Populations

Most of the stream reach under investigation is canopied by a narrow strip of riparian woodland. This is bordered by either residential and/or commercial properties or by wet meadow and old field communities. Bird communities were examined in a cursory manner during November and May. On June 22-24 a three day breeding bird census was made, documenting the use of the area by resident birds. The results of this survey are presented

TABLE 20

BREEDING BIRD CENSUS OF SITES ON ALLEN AND IRONDEQUOIT CREEKS, NEW YORK - 20-21 June 1980

Species	A	1	2	3	4	5	Status on study area and habitat
Great Blue Heron						X	UC - Standing and flowing water; feeding area but no nests on site
Mallard	X	X	X	X	X	X	C - Water; several broods of young seen
Wood Duck	X		X				UC - Water with adjacent hollow trees
Red-tailed Hawk						X	R - Forest edge; one nesting pair
Killdeer	X	X	X	X	X	X	C - Open sand, gravel, sparse low vegetation
Spotted Sandpiper	X		X	X		X	FC - Banks of stream, quarry
Rock Dove (Domestic Pigeon)	X	X	X			X	C - Developed areas
Mourning Dove	X	X	X	X	X	X	C - General
Great Horned Owl					#		R - Forest and brush
Barred Owl					#		R - Moist forest
Whip-poor-will					X		R - Mature forest
Common Nighthawk		#	#				R - Shopping plaza
Chimney Swift	X	X	X		X	X	FC - Aerial, often over water; nests in chimneys
Belted Kingfishers	X	X	X	X	X	X	C - Over water; nest cavities in banks observed
Common Flicker	X	X	X	X	X	X	C - Forest, woodland, and residential
Pileated Woodpecker	X				X		R - Mature upland forest
Red-bellied Woodpecker						X	R - Upland forest
Hairy Woodpecker	X				X		UC - Forest
Downy Woodpecker	X	X	X	X	X	X	C - Where trees
Eastern Kingbird		X		X			UC - edge
Great Crested Flycatcher						X	R - Upland forest
Eastern Phoebe	X		X		X	X	FC - Near water; nests buildings and bridges
Willow Flycatcher			X			X	UC - Low riparian brush, usually willow
Alder Flycatcher			X				VR - One individual in low riparian woodland
Eastern Wood Pewee						X	UC - Upland forest
Tree Swallow		X					R - Over water; nests in hollow trees or boxes
Bank Swallow	X	X	X	X	X	X	VC - Over water; large nesting colonies on and near sttes
Rough-winged Swallow			X	X		X	UC - Over water
Barn Swallow	X	X	X	X	X	X	C - Over water; nests in buildings, under bridges
Purple Martin	X						R - aerial; nest boxes seen on area not occupied
Blue Jay	X		X		X	X	FC - Woods and brush, residential
Common Crow	X		X	X	X	X	FC - General; forest nesting
Black-capped Chickadee	X	X	X	X	X	X	C - Forests, woodlands
Tufted Titmouse						X	UC - Forest

(continued)

TABLE 20 CONTINUED

Species	A	1	2	3	4	5	Status on study area and habitat
White-breasted Nuthatch					X	X	UC - Upland forest
House Wren	X		X	X	X	X	C - General
Gray Catbird	X	X	X	X	X	X	C - Brush
Brown Thrasher					X	X	UC - Brush, open woods
American Robin	X	X	X	X	X	X	C - General
Wood Thrush	X			X	X	X	FC - Upland forest
Veery						X	R - Dense forest
Blue-gray Gnatcatcher			X		X	X	UC - Forest
Cedar Waxwing	X			X	X	X	FC - Forest and woodland
Starling	X	X	X	X	X	X	VC - General
Red-eyed Vireo			X		X	X	UC - Forest
Warbling Vireo	X	X	X	X	X	X	C - Streamside trees
Black-and-white Warbler				X	X	X	FC - Forest
Yellow Warbler	X	X	X	X	X	X	VC - Riparian and brush
Cerulean Warbler	X			X	X	X	UC - Mature forest with canopy
Common Yellowthroat				X	X	X	UC - Brush and edge
American Redstart	X			X	X	X	C - Forest, woodland
House Sparrow	X	X	X	X	X	X	VC - General exclusive of forest
Red-winged Blackbird	X	X	X	X	X	X	VC - Marsh, streamsides, fields near water
Northern Oriole	X	X	X	X	X	X	FC - General where tall trees
Common Grackle	X	X	X	X	X	X	C -General; nests mainly in dense stands conifers
Brown-headed Cowbird	X	X	X	X	X	X	C - General
Scarlet Tanager					X	X	UC - Mature forest
Cardinal	X	X	X	X	X	X	C - General
Rose-breasted Grosbeak					X	X	R - Forest
Indigo Bunting	X		X	X	X	X	C - Brush and edge
American Goldfinch	X	X	X	X	X	X	C - General
Grasshopper Sparrow				X			VR = Grassland; one heard
Chipping Sparrow			X				R - Edge
Song Sparrow	X	X	X	X	X	X	C - General, particularly streamside brush
Number species/site	38	26	36	33	44	50	64 Species Overall
Species richness by site as percentage of total spp.	59%	41	56	52	69	78	

X = Observed # = Reported by local birders
VC = Very common C = Common FC = Fairly common UC = Uncommon R = Rare VR = Very rare
A = Allen Creek, both sides last ¼ mile 1-5 = Sites on Irondequoit Creek up and down from mouth of Allen Creek at # 3.

as Table 20.

The bird fauna documented is one which would be expected in a somewhat disturbed area in this geographic location. Urban species such as starling, house sparrow or rock dove were nesting in areas that were adjacent to more rural species such as indigo bunting, grosbeak and scarlet tanager.

Species richness was correlated with habitat diversity in most areas, sites four, five and Allen Creek having greater diversity of habitat, thus, greater species richness of birds. Local residents and bird watchers were encountered during the study and indicated that the bird fauna at site 3, 4 and Allen Creek were a significant local resource for non-consumptive use of the wildlife.

A total of sixty-four species of breeding birds were recorded in the study area, none of which are rare or endangered.

Mammal Populations

Mammals were surveyed partially during November and May. Intensive trapping of small mammals was accomplished during June, 1980. Tracks, signs and visual observations were recorded by all personnel during all phases of the field investigations during all collecting periods.

The results of the small mammal trappings (872 trap nights) are presented as Table 21. Similar to the results of the bird survey, the mammal fauna is typical of a suburban location in this portion of New York. The close proximity of the riparian woodland to heavily forested areas provides more whitetail deer than would be expected in the suburbs. Other species, red fox and grey fox probably represent individuals which live just slightly outside of the study area but hunt periodically

TABLE 21

RESULTS OF SMALL MAMMAL TRAPPING ON ALLEN AND IRONDEQUOIT CREEKS, NEW YORK

20-21 June 1980

Species	A	1	2	3	4	5	T	% of T
Short-tailed Shrew	2	2	-	3	-	2	9	18
Eastern Chipmunk	3	-	-	-	-	-	3	6
Meadow Vole	1	16	3	4	4	1	29	57
White-footed Mouse	3	-	1	1	4	-	9	18
Norway Rat	-	-	-	-	-	1	1	2
T. number caught	9	18	4	8	8	4	51	100
Trapnights	200	100	100	50	150	50	650	
% Trap success	5	18	4	16	6	8	8	

22-23 May 1980

Species	Aa	Ab	1	4	T	% of T
Meadow Vole	1	-	5	-	6	75
White-footed Mouse	-	-	-	2	2	25
T. number caught	1	0	5	2	8	100
Trapnights	27	15	27	36	105	
% Trap success	4	0	18	6	8	

10 November 1979

117 trapnights segregated by habitat as follows:

12 (10%) under bridges
25 (21%) in scrub field succession
43 (37%) in woodlands, forests
37 (32%) on creekbanks

Species	T	%T
Meadow Vole	1	6
Short-tailed Shrew	6	40
White-footed Mouse	8	53
T. number caught	15	
Trapnights	117	
% Trap success	13	

OVERALL RESULTS

Species	No. caught	% of T mammals caught
Short-tailed Shrew	15	20
Eastern Chipmunk	3	4
Meadow Vole	36	49
White-footed Mouse	19	26
Norway Rat	1	1
T. number mammals	74	100
Trapnights	872	
% Trap success	9	

A = Allen Creek, both sides, last ½ mile Aa, Ab = Same area, subsites
1-5 = Sites on Irondequoit Creek up and downstream from mouth of Allen Creek at site # 3

TABLE 22

REPTILES AND AMPHIBIANS OBSERVED IN THE STUDY AREA

TAXON	STATION NUMBER					
	1	2	3	4	5	ALLEN CREEK
American Toad		x	x	x	x	x
Bullfrog					x	
Green Frog	x		x	x		x
Grey Treefrog			x			x
Eastern Garter Snake		x	x		x	x
Brown Snake			x		x	x
Common Water Snake	x	x	x		x	x
Snapping Turtle	x					

within the study area. No rare or endangered mammals were collected or observed. A tabulation and annotated listing of mammals which were documented and/or are probable appears as Appendix I.

Amphibians and Reptiles

Throughout the course of this investigation, field crews noted the observation of amphibians and reptiles as they were encountered. No specific effort was made to search for or collect amphibians or reptiles, thus, the listing in Table 22 serves only as a partial listing of those species which occur in the study area.

Water Chemistries

The results of the chemical parameters measured during all sample periods is presented as Tables 23 - 25. All measurements indicate that water quality is good to excellent. No evidence of excessive BOD loadings or pH modification or elevation of temperature by unnatural means could be documented. Free CO_2 measurements are indicative of very low levels and considering the field error inherent in the test (up to 2.0 mg/l) we doubt that this parameter exceeds 8.0 mg/l.

TABLE 23

WATER CHEMISTRY OF IRONDEQUOIT CREEK

NOVEMBER, 1979

SITE 1	TEMPERATURE	O_2 PPM	pH	CO_2 MG/L
Night	*9.2/8.0*	*11.2/11.2*	*7.1/7.2*	*2.9/2.0*
Day	*8.5/8.0*	*11.2/11.4*	*7.2/7.2*	*2.3/1.9*
SITE 2				
Night	*8.5/8.0*	*11.9/11.4*	*7.1/7.2*	*2.8/1.8*
Day	*8.6/8.0*	*11.6/11.8*	*7.2/7.2*	*2.6/1.8*
SITE 3				
Night	*8.5/8.0*	*12.0/11.2*	*7.1/7.2*	*2.3/2.0*
Day	*8.8/8.0*	*11.8/11.9*	*7.0/7.1*	*3.0/2.0*
SITE 4				
Night	*9.0/8.0*	*11.5/11.2*	*6.5/6.9*	*3.1/1.7*
Day	*8.8/8.0*	*11.8/11.8*	*6.9/7.1*	*2.6/1.7*
SITE 5				
Night	*9.0/8.0*	*10.8/11.2*	*6.9/6.9*	*2.8/1.7*
Day	*9.4/8.0*	*11.2/11.2*	*7.0/8.0*	*2.2/1.7*

-/- = 10/11 NOVEMBER, 1979

TABLE 24

WATER CHEMISTRY OF IRONDEQUOIT CREEK

MAY 1980

SITE 1	TEMPERATURE	O_2 PPM	pH	Co_2 MG/L
Night	*14.5/15.0/17.0*	*9.4/10.3/9.5*	*8.3/8.2/7.9*	*6.9/6.5/5.2*
Day	*18.0/19.6/19.4*	*10.8/11.2/11.1*	*8.4/8.6/8.5*	*6.5/5.7/4.9*
SITE 2				
Night	*14.5/15.0/16.8*	*9.0/10.3/8.2*	*8.2/8.3/8.0*	*5.9/6.0/5.3*
Day	*18.0/19.5/19.7*	*12.2/10.4/11.0*	*8.4/8.4/8.3*	*5.6/6.0/4.9*
SITE 3				
Night	*14.8/15.0/16.5*	*8.3/10.3/9.0*	*8.4/8.2/8.1*	*6.0/5.9/5.5*
Day	*18.5/18.8/19.3*	*11.2/10.6/11/3*	*8.5/8.3/8.3*	*5.5/5.6/4.2*
SITE 4				
Night	*14.8/15.2/16.2*	*8.8/9.8/8.6*	*8.2/8.2/8.2*	*6.0/5.5/5.3*
Day	*18.1/19.2/19.8*	*9.3/11.8/12.1*	*8.1/8.2/8.3*	*4.4/5.1/5.0*
SITE 5				
Night	*14.8/16.0/16.5*	*8.9/9.6/9.3*	*8.3/8.2/8.1*	*6.0/5.8/5.2*
Day	*18.3/18.5/19.1*	*9.3/12.0/12.3*	*8.4/8.3/8.4*	*5.4/4.0/44*

-/-/- = 22/23/24 MAY, 1980

TABLE 25

WATER CHEMISTRY OF IRONDEQUOIT CREEK

JUNE, 1980

SITE 1	TEMPERATURE	O_2 PPM	pH	CO_2 MG/L
Night	*14.2/11.2/13.1*	*9.3/10.3/9.2*	*8.3/8.2/8.2*	*4.6/4.1/4.3*
Day	*12.9/15.1/15.1*	*10.2/10.9/9.3*	*8.3/8.3/8.4*	*4.4/5.0/4.4*
SITE 2				
Night	*14.3/11.5/13.1*	*9.1/10.2/9.0*	*8.2/8.2/8.2*	*4.4/4.3/5.4*
Day	*13.1/15.4/15.0*	*9.9/10.8/9.3*	*8.2/8.4/8.3*	*4.2/4.9/4.5*
SITE 3				
Night	*14.2/11.2/13.2*	*9.0/10.3/9.8*	*8.1/8.2/8.3*	*4.6/4.4/5.1*
Day	*13.1/15.5/15.5*	*9.8/10.2/9.2*	*8.2/8.3/8.3*	*4.5/4.6/4.5*
SITE 4				
Night	*14.3/11.1/13.2*	*9.2/11.0/9.8*	*8.1/8.2/8.3*	*4.7/4.4/5.6*
Day	*13.2/15.8/15.1*	*10.2/10.2/9.2*	*8.2/8.4/8.4*	*4.4/4.6/4.7*
SITE 5				
Night	*14.2/11.4/13.2*	*9.2/11.2/9.8*	*8.1/8.1/8.3*	*4.7/4.0/5.2*
Day	*13.2/16.6/15.2*	*10.1/10.1/9.1*	*8.1/8.4/8.2*	*4.1/4.2/4.2*

-/-/- = 20/21/22 JUNE, 1980

Effects of Stream Modifications

The alteration of the course of Irondequoit Creek would have only a temporary effect on the fish fauna of the stream. Since nearly all of the fishery is a migratory (temporary) one the effects during construction could have certain negative consequences. If construction were to be scheduled between June 15 and August 30 it is doubtful that any species other than the carp would be seriously affected.

The placement of the stream elsewhere, or the widening and channelization of the stream would remove the present canopy. This will effectively raise the temperature of the waters considerable, and should be avoided whenever possible. One side channelization with preservation of the riparian woodlands on the other side is very desireable in areas of station three and four.

Riffles and pools currently are rare in the stream and creation of a channel would create little change. If stream modification included the addition of small obstructions (similar to 2-3 ft high dams), pools would easily be created in the soft, gravelly substrates, This would create habitat which currently does not exist and as such would improve the fishery. Further, the stabilization of the banks with rip-rap would simultaneously create bank cover which also currently does not exist. Again, the fishery would be improved. We would predict that such mitigation measures would create a resident fish fauna which would include smallmouth bass, rockbass and other centrarchids at a level which currently does not exist.

Removal of riparian woodlands should be minimized

in relation to the bird and mammal fauna of the area. However, the removal of woodland in the area would be only a small fraction of the available local woodlands so we would not expect to observe any significant reduction in the bird fauna of the general area. We would expect that one side channelization of the small sections of stream under consideration would not significantly reduce local bird populations, even in areas adjacent to the stream.

Small mammal populations consist largely of meadow voles and shrews. Both species exist equally as well in grassy areas, thus little permanent effects would be likely to occur. We would expect that vole populations would increase slightly while shorttail shrew populations would decline slightly. Larger mammals, such as the raccoon or opossum utilize the area primarily as a route to other areas or for hunting in the stream. We would expect little change in the populations of either species, especially if one side channelizations were employed.

Possible Mitigation Measures

Throughout the results and discussions presented above it is the general impression that little negative effect will be observed in the study area due to stream modifications. While this may be true, it is our impression that slight modifications and mitigations of the possible construction could improve and/or lessen the potential damages. Suggestions for these mitigations are as follows:

1. Removal of riparian woodlands should occur only where absolutely necessary, and then only one side should be removed for channelization. This will insure that the stream will remain partially canopied and preserve a maximum amount of bird and mammal habitat.

2. Removal of riparian woodland at site one, two and four should occur on the southwest side of the stream while forest removal at station three should be done on the northeast side. This will result in less loss of forest, thus less loss of riparian habitat. This will also result in more stream canopy, thus aid in maintanence of cooler stream temperatures.

3. Efforts should be made to place low obstructions across the stream wherever possible. This will create deep pools in the soft substrates and improve fishery habitat.

4. Rip-rap placed on banks will insure both the stabilization of the banks and will create bank cover which currently does not exist.

5. Plantings of trees such as willow along the banks of the newly constructed channel will also aid in bank stabilizations and will eventually create canopy which would replace that lost to construction. In addition, plantings of trees known to produce wildlife foods (walnut, elder) within the disturbed area will provide food and cover which currently is not abundant.

Monitoring of the Project

Future monitoring of the effects of both the construction and mitigation measures of this project should begin within one year after construction has been completed. These studies would include a survey of the fishery, water chemistry studies and an evaluation of the changes in the bird and mammal faunas of the area. During the first year of monitoring, we would expect that the fishery would exhibit recovery to a level equal to or slightly in excess of that documented in this report. Bird and mammal populations would be expected to be similar to that documented in this present study.

At least three (and no more that five) years after the completion of the project, a final monitoring study should be conducted. This study should be essentially a duplicate of the study just completed, and will serve to document the predicted effects of the mitigations after all conditions have become somewhat stable. This study would document any changes in the resident fish fauna and would give indications as to the future effect of the plantings on the bird and mammal populations.

APPENDIX I

GENERAL ACCOUNT OF THE MAMMAL FAUNA

General Account of the Mammal Fauna

Opossum - *Didelphis marsupialis* - Tracks, reports. Probably occurs throughout all sites in Irondequoit and Allen Creeks.

Short-tailed Shrew - *Blarina brevicauda* - Occurs generally on all habitats in the flood plain of Allen and Irondequoit Creeks. One of the most abundant mammals.

Shrews spp. - *Sorex spp.* - Holes present on both Allen and Irondequoit sites. One trapped mouse eaten from trap in typical *Sorex* fasion. No specimens collected. Species possible include any or all of *S. fumeus*, *S. cinereus* or *S. dispar* in order of decreasing probability.

Hairytail Mole - *Parascalops breweri*, and Starnose Mole - *Condulura cristata*, both are highly probable, based on runs examined in both Allen and Irondequoit Creeks. Runs in drier areas are similar to those of Hairytails and those in damp areas or opening into water are likely that of the Starnose.

Bats (Vespertilionidae) of several species are likely in the study area. *Eptesicus fuscus* and *Myotis lucifugus* are highly probable. Others are possible but less likely. No specimens collected.

Raccoon - *Procyon lotor* - Occurs commonly throughout the entire area.

Longtail Weasel - *Mustela frenata* - May occur rarely, possible tracks were observed at station 4, along the banks of Irondequoit Creek.

Striped Skunk - *Mephitis mephitis* - Occurs uncommonly throughout the study area. Tracks at three sites.

Red Fox - *Vulpes fulva*, and Grey Fox - *Urocyon cinereoargenteus*, both have been reported from the area by local wildlife amateurs. Most of the area is more likely Red Fox habitat, but areas of the surrounding upland forests will support Grey Fox.

Domestic Dog - *Canis familiaris* - Occurs commonly throughout the study area. A few may be feral.

Domestic Cat - *Felis catus* - Fairly common throughout the area. Some are probably feral. A significant predator on small mammals and birds.

Woodchuck - *Marmota monax* - Very common at all locations. One of the most common medium sized mammals.

Eastern Chipmonk - *Tamias striatus* - Common at all locations except station one.

Grey Squirrel - *Sciurus carolinensis* - The commonest tree squirrel. Present at all sites except stations one and two. Probably uncommon at these two locations due to lack of residences or food trees.

Flying Squirrels - *Glaucomys volans , G. sabrinus* - These are probable in adjacent upland deciduous forest but none were collected or observed.

White-footed Mouse - *Peromyscus leucopus* - Occurs generally in brush and forested areas in both Allen and Irondequoit Creeks It is probably the most abundant small mammal in the woodlands. *Peromyscus maniculatus* may occur but no evidence was found.

Meadow Vole - *Microtus pennsylvanicus* - Occurs generally at all sites in suitable habitat of grasslands or, less abundantly, in forbs. Associated with damp or wet areas. Perhaps the most abundant small mammal in the study area.

Norway Rat - *Rattus norvegicus* - Collections and the presence of dens in streambanks indicates the presence of this species. Lack of croplands or urban areas provides little habitat. Rats trapped were small and the population in probably minimal.

House Mouse - *Mus musculus* - None collected but the species probably occure near dwellings.

Eastern Cottontail - *Sylvilagus floridanus* - Common at all locations in Irondequoit and Allen Creeks.

Muskrat - *Ondatra zibethica* - Occurs, but is not abundant, along all streams. Droppings and burrows were not common.

Whitetail Deer - *Odocoileus virginianus* - Tracks were observed at all sites on both streams.

STUDIES OF ALLEN CREEK , MAY, 1980

Allen Creek Studies

Modification P 00002 of Contract DACW49-79-C-0085 requests that surveys of the faunal components, stream chemistry, sediment grain size distribution, sediment eleutriate chemistry and aquatic vegetation be accomplished during May-June of 1980. The following is the result of that investigation.

The Fishery

Surveys of the fish fauna were made on 22-24 May and 21 June , 1980. As with the findings of the surveys in Irondequoit Creek, the fauna consisted largely of migrant spawning individuals, suckers, redhorse and ans carp. In addition, small stream species were present and these were presumed to be permanent residents. These included species such as longnose dace, darters and chubs.

Small brown trout, smallmouth bass and rockbass were present in the pools of the stream. It is possible that spawning runs of trout occur in this stream but were not observed due to the time of year in which the collections were made.

This section of Allen Creek contained clean substrates of gravel and cobble, quiet pools and well defined riffles. While little bank cover was available, deadfall covered much of the bank area in the lower two-thirds of the area under investigation. Upstream areas of the stream, above the section considered for modification, were similar in physiography, and were generally more canopied. These upstream areas represent a valuable fishery resource in the form of spawning grounds for catostomids and possibly for salmonids. Results of fishery collections have been presented as Table 3.

Birds and Mammals

Results of the bird and mammal survey in Allen Creek are presented as Tables 20 and 21. These results indicate that the riparian woodland in this area contains a diverse bird fauna even though the area is small in size. The area is utilized by local bird watchers since it is near access from the shopping center and Nalge parking lots. Mammal diversity and species composition is similar to that observed in Irondequoit Creek, Stations three and four.

Vegetation

Rooted aquatic vegetation does not exist in Allen Creek in the areas under study. A small tributary which enters at the upper limits of the study area contains beds of watercress and a small patch of yellow flag (iris) is present near its confluence. Vegetation even in this area is confined to a few square yards.

Water Chemistry

As with the chemical measurements of Irondequoit Creek, the water quality of Allen Creek is indicative of excellent water quality. CO_2 values are consistantly low and O_2 and pH are normal and stable. Results of chemical measurements taken during the 22-24 May period are presented as Table 26.

Sediment Studies

Sediment samples were collected at three points in Allen Creek as illustrated in Figure 2. Samples of sediment from surface and 14 inches below the

TABLE 26

WATER CHEMISTRY OF ALLEN CREEK

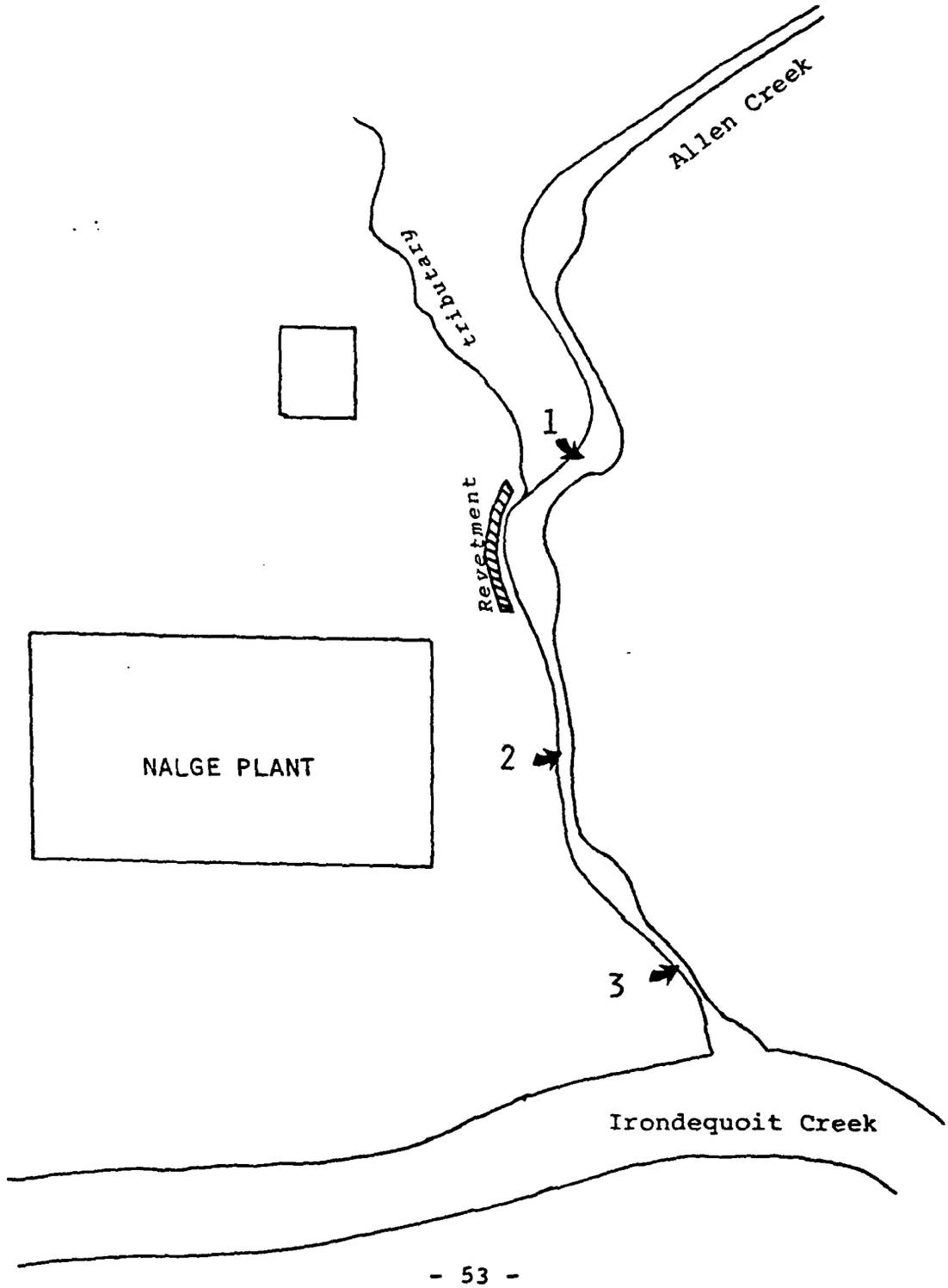
MAY, 1980

SITE 1	TEMPERATURE °C	O_2 PPM	pH	Co_2 MG/L
Night	*13.8/13.8/15.4*	*8.4/8.3/8.6*	*8.2/8.2/8.1*	*5.4/7.0/4.9*
Day	*18.6/18.4/19.3*	*12.2/11.1/11.4*	*8.6/8.6/8.5*	*5.0/6.1/4.0*
SITE 2				
Night	*13.5/14.0/16.0*	*8.5/9.6/8.8*	*8.2/8.1/8.0*	*5.6/7.4/5.3*
Day	*18.5/19.0/19.7*	*12.2/11.6/11.9*	*8.5/8.4/8.4*	*5.1/4.5/4.2*
SITE 3				
Night	*13.4/13.0/15.0*	*8.8/9.9/8.8*	*8.1/8.2/7.8*	*5.8/8.0/4.7*
Day	*18.2/18.8/19.6*	*12.5/10.3/11.8*	*8.5/8.5/8.6*	*4.2/5.3/4.1*

-/-/- = 22/23/24 MAY, 1980

FIGURE 2 - ALLEN CREEK

LOCATION OF SEDIMENT, WATER CHEMISTRY
AND BENTHOS COLLECTIONS



surface of the creekbed. Equal parts of the three samples from the surface were then composited to make a single representative sample, as were three parts of the subsurface samples. These samples were placed on ice and transported to the laboratory. Analyses for grain size and metals eleutriate were accomplished according to ASTM and/or USEPA approved methods. The results of the grain size analyses are presented as tables 27 and 28. Results of the metals analyses and pesticide determinations are presented as Table 29. All test results indicate that eleutriate concentrations are negligible compared to allowable limits and that silt content is low. It is concluded that the removal and/or disposal of these sediments will pose no threat to the environment.

Benthos Collections

Benthic invertebrates were collected at each of the three sites indicated in Figure 2. Samples were collected and processed in the same manner as has been discussed in previous sections of this report. The results of these collections are presented as Tables 30-32. These results were similar to those recorded for Irondequoit Creek.

TABLE 27

ALLEN CREEK - SURFACE

GRAIN SIZE ANALYSIS *

SCREEN SIZE	WEIGHT OF SEDIMENT RETAINED	% OF TOTAL
> 5/16 INCH	1410.57 gm	50.14 %
# 5, 4MM	204.08 gm	7.25 %
# 10, 2MM	171.74 gm	6.10 %
# 18, 1MM	151.65 gm	5.39 %
# 30, .59MM	136.55 gm	4.85 %
# 50, .30MM	235.20 gm	8.36 %
# 100, .149MM	330.05 gm	11.73 %
# 200, .074MM	112.52 gm	4.01 %
SILT < .074MM	61.06 gm	2.17 %
	2813.42 gm	100.00 %

* PROCEDURES ACCORDING TO ASTM METHODS

ALL SAMPLES WEIGHED TO NEAREST .01GM

TABLE 28

ALLEN CREEK - SUBSURFACE

GRAIN SIZE ANALYSIS *

SCREEN SIZE	WEIGHT OF SEDIMENT RETAINED	% OF TOTAL
> 5/16 INCH	823.23 gm	48.64 %
# 5, 4MM	149.28 gm	8.82 %
# 10, 2MM	111.87 gm	6.61 %
# 18, 1MM	126.48 gm	7.47 %
# 30, .59MM	186.57 gm	11.02 %
# 50, .30MM	213.63 gm	12.62 %
# 100, .149MM	61.83 gm	3.65 %
# 200, .074MM	9.25 gm	0.55 %
SILT < .074MM	10.51 gm	0.62 %
	1692.65 gm	100.00 %

* PROCEDURES ACCORDING TO ASTM METHODS

ALL SAMPLES WEIGHED TO NEAREST .01GM

TABLE 29

METALS DETERMINATIONS OF WATER EXTRACTIONS OF ALLEN CREEK SEDIMENTS

PARAMETER	SURFACE SEDIMENT COMPOSITE	SUB-SURFACE SEDIMENT COMPOSITE
ARSENIC	< 0.01 ppm	< 0.01 ppm
BARIUM	< 1.00	< 1.00
CADMIUM	< 0.01	< 0.01
CHROMIUM	< 0.01	< 0.01
LEAD	< 0.01	< 0.01
MERCURY	< 0.00031	< 0.00068
SELENIUM	< 0.01	< 0.01
SILVER	< 0.01	< 0.03
TOTAL PESTICIDES	ND	ND

TABLE 30

23 MAY - BENTHIC COLLECTIONS
ALLEN CREEK - STATION 1
PENFIELD, NEW YORK

TAXON	NO./ SQ. METER RIFFLE	POOL
Oligochaeta	319	247
Isopoda		
Asellus sp.	79	-
Hirudinea	4	-
Insecta		
Diptera		
Simulidae (type A)	516	-
Simulidae (type B)	108	-
Orthocladiinae	3132	43
Chironominae	58	11
Dipteran pupa	713	22
Ephemeroptera		
Ephemerella sp.	36	-
Trichoptera		
Hydropsyche sp.	122	-
Cheumatopsyche sp.	7	-
Hydroptila sp.	14	-
Coleoptera		
Hyperodes sp.	4	-
Stenelmis	7	-
Mollusca		
Gastropoda		
Lymnaea sp.	4	11
Pelecypoda		
Sphaerium sp.	-	22
Other		
Misc. Catostomid eggs	168	-

TABLE 31

23 MAY - BENTHIC COLLECTIONS
ALLEN CREEK - STATION 2
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER RIFFLE	POOL
Oligochaeta	2634	1301
Isopoda		
Asellus sp.	97	978
Amphipoda		
Gammarus sp.	-	32
Hirudinea	-	54
Insecta		
Diptera		
Simulidae (type A)	1150	75
Simulidae (type B)	118	-
Orthocladiinae	13771	570
Chironominae	140	204
Dipteran pupae	1333	194
Ephemeroptera		
Hypropsyche sp.	290	-
Cheumatopsyche sp.	32	-
Hydroptila sp.	806	11
Hyproptilidae (pupae)	32	-
Coleoptera		
Stenelmis sp.	54	97
Mollusca		
Gastropoda		
Lymnaea sp.	-	32
Gyraulus sp.	-	32
Ferrissia sp.	11	32
Other		
Catostomid eggs	75	64

TABLE 32

23 MAY - BENTHIC COLLECTIONS
ALLEN CREEK - STATION 3
PENFIELD, NEW YORK

TAXON	NO. / SQ. METER COBBLE RIFFLE	POOL
Oligochaeta	4784	634
Isopoda		
Asellus sp.	43	11
Hirudinea	32	-
Insecta		
Collembola		
Isotomerus	11	-
Plecoptera		
Acroneuria sp.	-	11
Ephemeroptera		
Ephemerella sp.	11	-
Tricoptera		
Hydropsyche sp.	86	-
Hydroptila sp.	3644	-
Leucotrichia sp.	376	-
Diptera		
Simulidae (type A)	344	-
Simulidae (type B)	11	-
Orthocladiinae	35701	581
Chironominae	172	11
Tanypodinae	11	-
Dipteran pupae	3010	97
Mollusca		
Gastropoda		
Lymnaea sp.	-	22
Pelycepoda		
Sphaerium sp.	-	43
Other		
Fish Eggs	32	-
Sucker larvae	11	-

Conclusions and Mitigation Alternatives

The vegetation, benthos and chemistries of Allen Creek are essentially the same as those found in the various areas of Irondequoit Creek. Riparian woodlands have equivalent value in the Allen Creek area, thus should be preserved whenever possible.

The fishery of Allen Creek is not only a migratory route but definitely serves as a spawning area for the redhorse, suckers and probably trout. As such, it like Irondequoit Creek, should not be permanently obstructed. Two pools are present in Allen Creek which are deeper than any found in Irondequoit and as such provide refuge for smallmouth and trout. These pools should be replaced by artificial means if they are removed during channelizations.

Possible suggestions for improvement and/or mitigation of this area are similar to those already suggested for Irondequoit Creek with the addition of the following:

1. Channelization of the area should be done in the area north of the existing streambed. This area consists of sandy flatlands which have no trees and little forb vegetations. Mammal and bird populations in this area are very limited. Placement of the channel in this area would do very little environmental damage and would thus create habitat as well as preserve the integrity of the Allen Creek riparian woodlands.

2. Spoils from channelization of the field should not be placed into the Allen Creek existing bed. The small tributary entering just upstream of the revetment should be allowed to flow into the present channel of Allen Creek, thus partially maintaning flow. The resulting stream will become a backwater of Irondequoit Creek during highwater periods and will act as a small intermittant stream at other times.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
HARRISBURG AREA OFFICE
100 Chestnut Street, Room 310
Harrisburg, Pennsylvania 17101

December 16, 1980

Colonel George P. Johnson
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

This constitutes our detailed report on effects the proposed flood control project on Irondequoit Creek, Monroe County, New York, would have on fish and wildlife resources. It has been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and is for inclusion in your final feasibility report.

Investigations for improvement on Irondequoit Creek and tributaries, including Allen Creek, for flood control and allied purposes were authorized by resolution of the House of Representatives, Committee on Public Works. The authorization for study is contained in Section 208 of the Flood Control Act of 1965 (Public Law 89-298) adopted October 27, 1965.

Our report is based on project plans and information provided by your staff through July 31, 1980, biological studies conducted for the Corps of Engineers by Environmental Resource Associates, Inc., and field reconnaissance by U.S. Fish and Wildlife Service personnel. This report was prepared by Mark W. Clough, Project Biologist, under the supervision of Paul P. Hamilton, Field Supervisor, U.S. Fish and Wildlife Service, Cortland, New York. The report has the concurrence of the Division of Fish and Wildlife of the New York State Department of Environmental Conservation as signified by the enclosed letter from Director Kenneth F. Wich to Field Supervisor Hamilton dated October 10, 1980.

The U.S. Fish and Wildlife Service has previously provided the Buffalo District, Corps of Engineers, comments dated February 9, 1977, regarding the Draft Plan of Study, comments on the scope of work for biological studies dated April 27, 1979, a planning aid letter dated June 1, 1979, and comments on the preliminary feasibility report in a letter dated September 13, 1979.

Description of the Project

The Irondequoit Creek Watershed drains an area of approximately 139 square miles and includes portions of Monroe, Ontario, and Wayne Counties in central New York State. Irondequoit Creek flows northward from its headwaters near Canandaigua, New York, to Irondequoit Bay which flows into Lake Ontario. Irondequoit Creek has a total length of approximately 32 miles excluding its major tributaries, Allen Creek and Thomas Creek.

The Corps of Engineers surveys of floodprone areas in the Irondequoit Creek Watershed determined that the Panorama Plaza Area, Town of Penfield, New York, is the only area recommended for structural flood control measures.

The selected alternative for flood control in the Panorama Plaza area is the levee/floodwall plan (Alternative B). The proposed project would include construction of levees and floodwalls along Allen Creek and Irondequoit Creek and channelization with realignment of a portion of Allen Creek. The plans are based on a 500-year level of protection. The earthen levees would have a trapezoidal cross section, with sideslopes of 1 vertical on 2.5 horizontal and a 10-foot wide crown. Sheet piling and concrete floodwalls are proposed for constricted areas where there is insufficient land width for the construction of levees. Structure heights described below include freeboards of 3 feet for levees and 2 feet for floodwalls.

Figure 1 shows the general location of the study area. Figure 2 shows the locations of the proposed flood control structures along Irondequoit and Allen Creeks and the proposed channelization and realignment along Allen Creek.

A levee would be constructed along the east bank of Irondequoit Creek in the reach between the Route 441 Bridge and the Panorama Trail Bridge. The levee would average approximately 6 feet in height, including freeboard, and would extend from a high ground point behind an existing bowling alley, to the road embankment at the Panorama Trail Bridge.

In the reach between the Panorama Trail Bridge and the Penfield Road Bridge, a levee would be constructed along the east bank. The levee would begin at the Panorama Trail Road embankment and continue along the east edge of the Harney Printing parking lot. The printing firm would not be protected, therefore acquisition of this building is proposed. The levee would continue along the rear property lines of the commercial properties along Panorama Trail. The average height of the levees in this reach would be 6 feet. The levee would continue on along the outside perimeter of the undeveloped areas behind and to the west of the Panorama Plaza and connect to the high embankment at the Penfield Road Bridge. The average height of this section of the levee would be 7.5 feet. Along the west bank of Irondequoit Creek, in the reach between the Panorama Trail Bridge and the confluence of Allen Creek, a floodwall would be placed behind the immediate treeline. The average height of the floodwall would vary from 5.5 feet upstream to 6.5 feet downstream.

In the reach from the Penfield Road Bridge downstream, a levee, averaging 7 feet in height, would begin at the Penfield Road embankment and continue along the east bank across Old Penfield Road. The levee would continue along the alignment of the access road to the Genesee Conservation League at an average height of 6 feet, and turn north just north of the Brookhill Apartments and connect to existing high ground. A road would be constructed on the crest of the levee to maintain access to the Genesee Conservation League property. Riprap is proposed along the outside banks of the two curves just downstream of the Old Penfield Road Bridge, due to the high velocities in this reach of Irondequoit Creek. A drainage easement at Quarry Lake would be maintained to preserve the natural overflow which presently occurs during high stages in Irondequoit Creek. Riprap is also proposed 25 feet upstream and 25 feet downstream of the Penfield Road Bridge and Old Penfield Road Bridge.

The Plaza Extension Bridge and the Old Penfield Road Bridge will be closed to vehicular use but will remain in place to aid in reducing erosive velocities downstream during high stages.

The project involves channelization of Allen Creek from its mouth to approximately 900 feet upstream. The entire 900-foot section would be riprapped on the sides and bottom. The upper 500 feet of this reach would be relocated westerly along a meandering alignment to allow sufficient room to construct a levee along the east bank between the Sybron-Nalge parking lot and Allen Creek. The lower 400 feet of the channel would be aligned along the existing channel. A 3-foot drop structure, constructed of sheet piling, would be located 850 feet upstream from the confluence to dissipate energy and reduce velocities. The channel would have a 30-foot bottom width with 1 to 2.5 sideslopes and would cut a gradient to match the bottom elevation at the 3-foot drop structure. A low-flow channel would be installed along the entire length of the Allen Creek rechannelization.

An internal storm drainage system consisting of 42-inch diameter culverts with flapgates and sluice gates at three locations and twin 3.5 x 7-foot diameter culverts with a 6,000 GPM pump at one location (see figure 2) would be included in project design. This would allow internal stormwater run-off to flow back into the creek.

Aquatic and Terrestrial Ecosystems

General

The project area involves approximately 1 mile of Irondequoit Creek extending downstream from the Route 441 crossing to just south of the gravel quarry, and approximately 900 feet of Allen Creek extending downstream from the sharp bend adjacent to the southwest corner of the Sybron-Nalge Plant to the confluence with Irondequoit Creek. This area, in the vicinity of the Panorama Plaza, has undergone extensive commercial, industrial and residential development.

Fish and wildlife habitats which would be affected by the project, have been previously disturbed and, for the most part, are confined to a rather narrow band along the creek. This section of Irondequoit Creek had been severely degraded in the past, largely due to the discharge of improperly treated sewage to the creek. With the implementation of water pollution control programs in the watershed, the water quality of Irondequoit Creek has greatly improved and there is considerable use of the existing habitat within the project area by fish and wildlife.

Aquatic Resources

The waters of Irondequoit Creek within the project area have been classified as Class B under the New York State Environmental Conservation Law. Allen Creek is Class B(t), water quality standards for trout waters apply. Although severely degraded in the past, water quality within the project area is presently good to excellent. This improvement is apparently a result of the Monroe County Pure Water Sewage Diversion Program. This program which began in 1970 was established to upgrade water quality throughout the watershed. A series of interceptors became operational in the spring of 1978 eliminating all municipal sewage discharges into Irondequoit Creek and its tributaries. Measurements of dissolved oxygen, pH, CO_2, and temperature indicate good to excellent water quality in both Irondequoit and Allen Creeks. Dissolved oxygen levels and pH are normal and stable, and CO_2 values are consistently low. No excessive BOD loadings or pH modification or unnatural temperature elevations are evident.

Studies of benthic populations indicate a relatively low abundance of individuals and a lack of species diversity. Oligochaetes are dominant throughout the project area. Other macro-invertebrate groups found include isopods, dipterans, trichopterans, gastropods, and pelecypods. Benthic populations in the study area are probably limited by the continual siltation and shifting substrates and sparse aquatic vegetation.

Irondequoit Creek, within the project area, is generally uniform in character. For the most part, the creek bottom is shifting silty sands and coarse gravels. The reach just downstream of Route 441 contains a riffle system of bedrock and cobble substrates, and a shallow pool. Allen Creek contains clean substrates of gravel and cobble, well defined riffles and deeper pools than those found in Irondequoit Creek. Both creeks, within the project area, are nearly completely covered by the canopy of a narrow band of riparian woodland. This cover is important in maintaining lower water temperatures during the summer, however, the reduced penetration of sunlight along with a lack of quiet areas and shifting substrates result in a lack of extensive aquatic vegetation.

Valuable fisheries resources exist in Irondequoit Creek. Upper areas of the watershed are classified as trout waters and steelhead are stocked yearly. Rainbow trout and chinook salmon move through the project area during spring and fall spawning migrations. Upstream from the project area trout stocking is carried out and a good population of native brown trout also exists and fishing pressure is considered heavy. Brown trout have also been taken within the project area and trout populations are expected to extend their ranges downstream to include the project area as water quality continues to improve. Although not presently a spawning area for coldwater species, the riffle areas near Route 441 and near the mouth of Allen Creek have potential for the successful reproduction of brown trout and rainbow trout, and the project area is used by migrating adult salmonids and returning smolt. Some spawning by warmwater fishes such as pumpkinseed, bluegill sunfish, yellow perch, suckers and minnows occurs within the project area, however, Irondequoit Creek serves primarily as a route for migration to upstream spawning areas and smaller tributaries. Table 1 lists the fish species found within the project area in Irondequoit and Allen Creeks. The fishery of Allen Creek is similar to that of Irondequoit Creek and it not only serves as a migratory spawning route, but provides definite spawning areas for redhorse, suckers, and probably trout. Its well defined riffle areas and deeper pools are excellent aquatic habitat, and areas upstream of the project area also provide valuable spawning grounds.

Terrestrial Resources

Terrestrial habitat which would be affected by the project is generally confined to a narrow band of riparian woodland along Irondequoit and Allen Creeks. The riparian vegetation is predominantly eastern cottonwoods on sandy soils with scattered shrubs and herbaceous understory. More extensive woodlands, old field areas, and wet meadows are found nearby which contribute to the species diversity and numbers of individuals utilizing the riparian woodlands within the project area.

Sixty-four species of birds were recorded in the study area during a June 1980 Breeding Bird Census. Some of the more common avian species found include mallard duck, killdeer, rock dove, mourning dove, belted kingfisher, common flicker, downy woodpecker, bank swallow, barn swallow, black-capped chickadee, house wren, gray catbird, American robin, warbling vireo, American redstart, common grackle, brown-headed cowbird, cardinal, indigo bunting, American goldfinch, and song sparrow. Other less common but notable species include great blue heron, wood duck, red-tailed hawk, and great horned owl. Avian fauna utilizing the riparian woodlands are an important resource for non-consumptive uses of wildlife by local residents and bird watchers.

Mammal surveys indicate considerable use of the project area and a good diversity of species. Species commonly found to utilize the area include short-tailed shrew, meadow vole, white-footed mouse, raccoon, woodchuck, eastern chipmunk, gray squirrel, eastern cottontail rabbit, and whitetail deer. Less abundant species include striped skunk, red fox, Norway rat, and muskrat.

Reptiles and amphibians observed in the project area include the American toad, bullfrog, green frog, gray treefrog, eastern garter snake, brown snake, common water snake, and snapping turtle.

Project Impacts on Aquatic and Terrestrial Ecosystems

Aquatic Resources

Construction of levees and floodwalls along the streambanks would require clearing and removal of the existing vegetation in the areas occupied by the structures. Throughout most of the project area, the riparian woodlands lining Irondequoit and Allen Creeks provide a nearly complete canopy. Loss of this stream cover would result in higher water temperatures which would affect both the existing and future fisheries resources. Without the shade producing riparian vegetation, the resulting elevated water temperatures would produce unsuitable conditions for continued use of the area by coldwater species such as rainbow trout and chinook salmon. This would have an adverse impact on spawning migrations by

these species to upstream spawning grounds. This section of the creek would no longer provide habitat conditions suitable for use by steelhead and salmon smolts, and the anticipated future expansions of brown trout populations to include the project area would be eliminated. Extreme increases in water temperatures during summer low flow conditions could result in fish kills affecting resident warmwater fish populations as well. Loss of immediate streamside vegetation along Irondequoit Creek would be minimized with the proposed set-back placement of the levee and floodwall structures.

Increased erosion and sedimentation generated during project construction or resulting from permanent loss of streamside vegetation which functions to stabilize the stream banks could also adversely affect the aquatic resources within and downstream of the project area. A limited amount of fish mortality can be expected to result from gill damage caused by increased turbidity levels. Most motile individuals will avoid areas of excessive tubidity, however, substantial adverse impacts could result from interference with spawning activities of warmwater species within the project area. Excessive sediment deposition on active spawning areas would result in destruction of fish eggs and larvae. Increased sedimentation would also disrupt the existing benthic communities. The extensive wetlands located downstream where Irondequoit Creek enters Irondequoit Bay would also be subject to some degree of degradation caused by an increased sediment load.

Channelization produces additional and generally more severe adverse impacts to aquatic ecosystems. Major channel work is proposed along Allen Creek and minor channel work for placement of riprap is to be conducted on Irondequoit Creek. Impacts associated with loss of riparian stream cover, increased erosion, excessive turbidity and sedimentation in the channelized section would be similar to those described above. Substantial adverse impacts can be expected to result from alteration of existing aquatic habitat features and the permanent loss of habitat diversity usually associated with the development of smooth, flat, straightened channels. Loss of existing habitat features such as riffle and pool areas, debris snags, and stream meanders, which characterize the lower reaches of Allen Creek, would greatly reduce the fisheries value of the creek for both resident and migratory species. Relocation of approximately 500 feet of Allen Creek and filling of the old channel for placement of a levee along the western boundary of the Sybron-Nalge Plant would eliminate the existing habitat in that section of the creek. At the upper end of the channelization a sharp bend would be cut off. This area presently provides a deepwater area which is shaded by a gabion wall along the outside bank. Riparian vegetation along the inside bank and scattered boulders in this area provide additional cover and resting places of value to the fishery particularly during periods of low flow. The remainder of the section proposed to be relocated and

the lower 400 feet proposed for channelization along the existing alignment are similar, consisting of well defined riffle and pool areas within a meandering, canopied stream channel. Significant, long-term adverse impacts to aquatic resources would be avoided provided specific measures are included in final project design to maintain or replace fisheries habitat features and stream conditions within the relocated and channelized stream sections.

Terrestrial

Project related impacts to terrestrial resources would be associated primarily with the loss of riparian vegetation. The riparian woodland lining the creek provides sources of food and cover for wildlife, and promotes considerable use of the project area by avian and mammalian species, as well as several species of reptiles and amphibians. Removal of riparian trees and shrubs for placement of flood control structures along Irondequoit Creek and channel enlargement along Allen Creek would result in a decline in both the numbers of individuals and the diversity of wildlife species which presently utilize the project area. Set-back levees and floodwalls would minimize these impacts along Irondequoit Creek. Displacement of wildlife to habitat outside the project area would also place additional stress on populations already affected by rapidly expanding development. Reductions in wildlife found within the project area would have an adverse effect on the quality of this resource for local residents as a means of passive recreational enjoyment for purposes such as wildlife observation and nature photography.

Plan of Development for Aquatic and Terrestrial Ecosystems

The most serious environmental impacts associated with this project are those associated with loss of riparian vegetation and degradation of fisheries habitat. The selected plan, the levee/floodwall plan (Alternative B), was developed as a result of continued coordination between the Corps of Engineers, the U.S. Fish and Wildlife Service, and the New York State Department of Environmental Conservation. Mitigative measures included in the selected plan were mutually agreed upon during project coordination. Channelization along the lower portion of Allen Creek was proposed as part of the levee/floodwall plan to avoid more extensive channel work along Irondequoit Creek. Of all practicable alternatives considered, the levee/floodwall plan would be the least environmentally damaging method of flood control for the Panorama Plaza Area, provided the following measures to mitigate adverse impacts to fish and wildlife are included, at project cost, in final project design and implementation.

Interference with fish spawning migrations and spawning activities within the project area should be avoided by scheduling construction during the summer months, between spawning periods, and when fewer individuals would be present within the project area. Instream construction activities should be limited to the period from June 15 to August 30.

Adverse impacts to aquatic and terrestrial resources resulting from clearing of riparian vegetation should be avoided. Levee and floodwall structures should be constructed as far back from the stream as possible behind the existing band of trees and shrubs. Set-back levees would allow existing undeveloped areas along the stream to continue to function as a natural floodplain, which could also be used for recreational purposes. The existing vegetation between the proposed structures and the stream should remain intact, as the large trees which provide stream cover and wildlife habitat would not be easily replaced. Channel work along Allen Creek should be confined to one bank, or alternate from one bank to the other, allowing existing riparian vegetation on one bank at any given location to remain intact. This will partially preserve the important shade producing canopy over the stream.

The levee banks, disturbed stream banks along Allen Creek, and any other areas cleared during construction should be replanted as soon as possible following construction to control erosion and sedimentation and to restore disturbed stream cover and wildlife habitat. Plantings of trees, shrubs, grasses, and legumes should be used to aid in streambank stablization and provide stream cover. Vegetation having cover and forage value to wildlife, in addition to providing erosion control, such as willow, autumn olive, honeysuckle, dogwood, elder, walnut, foxtail grasses, panic grasses, and legumes should be used to revegetate disturbed areas along the streambank and the earthen levees. Project funding should provide for post-construction inspections of revegetated areas, approximately 1 year and 3 years after planting, and replacement of any vegetation not properly established.

Measures to control erosion and sedimentation during construction activities should be included in project plans. In addition to scheduling construction during summer low flow periods, filtering devices and techniques such as the use of hay bales, jute mesh, retention basins, and siltation curtains should be specified in design and construction plans.

With the existing and anticipated future fisheries value of Irondequoit Creek and Allen Creek, measures to compensate for losses of existing instream fisheries habitat features, particularly in the channelized section of Allen Creek, should be included in project plans, and funded as part of the project. As previously described, the proposed relocation and channelization work in Allen Creek will alter or eliminate existing habitat features which are essential to continued use of the creek by migrating and resident fish species. The new channel, in the relocated section, should be constructed along a meandering alignment designed so that the new channel will be at least equal in length to the actual stream length of the cut off section, including bends. Channel work along the lower section of the stream should follow the existing alignment,

maintaining existing curves and bends. Due to erosive velocities, riprap along the sides and bottom of the entire channelized section is proposed. Riprap should consist of large and small stone sizes placed in an irregular configuration to form a rough channel. Boulder-sized stones should be placed along the channel bottom to provide additional cover and resting places. Placement of riprap along the banks at the proposed locations on Irondequoit Creek should be accomplished in the same manner. A low-flow channel in Allen Creek should be designed in the channel bottom to provide a water depth of at least 2 feet during low-flow periods to maintain fish passage. The low flow channel should be located to one side of the stream channel, or meander from side to side, to take maximum advantage of riparian cover. The channel bottom should also be designed to create artificial riffle and pool areas along the length of the channelized section. Project planning should allow for the design of the proposed 3-foot drop structure to insure that it will not block upstream fish migrations. In addition, a plunge pool of at least 3 feet in depth should be constructed at the base of the structure.

The above recommended measures were mutually agreed upon during project coordination, therefore development of detailed design and construction plans to implement these measures would not result in substantial alteration of the proposed project. Detailed plans for vegetative plantings, and design and placement of instream fisheries habitat and fish passage features should be developed by the Corps of Engineers, in cooperation with the U.S. Fish and Wildlife Service, Soil Conservation Service, and the New York State Department of Environmental Conservation.

Recommendations

We recommend that:

1. To minimize adverse impacts on aquatic resources, instream project construction should be scheduled during the period from June 15 to August 30.

2. Levee and floodwall structures should be constructed as far back from the stream as possible, allowing existing riparian vegetation to remain intact, as proposed.

3. Channel work along Allen Creek should be confined to one bank, or alternate from one bank to the other, allowing existing stream canopy and riparian habitat on one bank to remain undisturbed at any given location.

4. The levee banks, disturbed stream banks along Allen Creek, and any other areas cleared during construction should be replanted as soon as possible following construction. Prior to project implementation, detailed plans for the vegetative planting program should be developed by the Corps of Engineers, in cooperation with the U.S. Fish and Wildlife Service, Soil Conservation Service, and the New York State Department of Environmental Conservation. Project funding should include replantings with species which would provide erosion control and equivalent or improved stream cover and wildlife habitat. Post-project inspections and replanting of any vegetation not properly established should take place approximately 1 year and 3 years after project completion, at project cost.

5. Project plans and specifications should include the use of erosion and sedimentation control devices and construction techniques to minimize potentially adverse impacts during construction and until disturbed vegetation is reestablished.

6. To maintain suitable aquatic habitat and stream conditions, specific measures to offset potentially adverse impacts resulting from stream channelization along Allen Creek should be included in project plans and implementation. Prior to project implementation, detailed plans for the design and placement of instream aquatic habitat and fish passage features should be developed by the Corps of Engineers, in cooperation with the U.S. Fish and Wildlife Service and the New York State Department of Environmental Conservation. The following measures should be included and funded as part of the project.

   a. Channelization should be confined to the lower 900 feet of Allen Creek, and only minor channel work for placement of riprap should be conducted in Irondequoit Creek.

   b. Existing channel length should be maintained by constructing the relocated stream channel along a meandering alignment, and following the existing alignment for the remainder of the proposed channelization.

   c. Riprap should consist of large and small stones placed in an irregular configuration to form a rough channel, with boulder-sized stones placed randomly along the channel bottom. Instream bank stabilization along Irondequoit Creek should be accomplished in the same manner.

   d. A properly designed low flow channel should be provided in the channelized section to maintain fish passage.

e. The channel bottom should be designed to create artificial riffle and pool areas along the length of the channelized section to replace existing riffles and pools.

f. A plunge pool at least 3 feet in depth should be constructed at the base of the proposed 3-foot drop structure. In addition, project planning should allow for future refinements in the design of the proposed drop structure to insure that it will not obstruct fish passage.

Please continue to coordinate this project with us as it develops, and advise us of any changes so that we may revise our report, if necessary.

Sincerely,

Norman R. Chupp
Area Manager

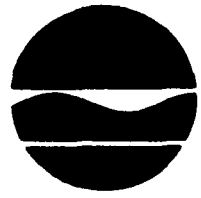
Enclosures

Table 1. List of Fish Species Present Within the Project Area.*

Common Name	Scientific Name	Irondequoit Creek	Allen Creek
Chinook Salmon	Oncorhynchus tshawytscha	X	
Rainbow Trout	Salmo gairdneri	X	X
Brown Trout	Salmo trutta	X	X
Northern Pike	Esox lucius	X	X
White Sucker	Catostomus commersoni	X	X
Shorthead (northern) Redhorse	Moxostoma macrolepidotum		X
Golden Redhorse	Moxostoma erythrurum	X	X
Black Redhorse	Moxostoma duquesnei		X
Silver Redhorse	Moxostoma anisurum	X	X
Carp	Cyprinus carpio	X	X
Goldfish	Carassius auratus	X	
Spottail Shiner	Notropis hudsonius	X	
Common Shiner	Notropis cornutus	X	X
Creek Chub	Semotilus atromaculatus	X	X
Bluntnose Minnow	Pimephales notatus	X	X
Longnose Dace	Rhinichthys cataractae		X
Blacknose Dace	Rhinichthys atratulus	X	X
Black Bullhead	Ictalurus melas	X	
Brown Bullhead	Ictalurus nebulosus		X
White Perch	Morone americana	X	X
Smallmouth Bass	Micropterus dolomieui	X	X
Rockbass	Ambloplites rupestris	X	X
Bluegill	Lepomis macrochirus	X	X
Pumpkinseed	Lepomis gibbosus	X	X
Green Sunfish	Lepomis cyanellus	X	
Walleye	Stizostedion v. vitreum	X	
Yellow Perch	Perca flavescens	X	X
Tesselated X Johnny Darter	Etheostoma olmstedi X nigrum		X

* From 1979-1980 biological studies conducted by Environmental Resource Associates.

New York State Department of Environmental Conservation
6274 E. Avon-Lima Rd., Avon, NY 14414 716-226-2466



Robert F. Flacke
Commissioner
Eric A. Seiffer
Regional Director

October 10, 1980

Mr. Paul P. Hamilton
Field Supervisor
U.S. Department of Interior
Fish and Wildlife Service
100 Grange Place, Rm 202
Cortland, NY 13045

Dear Mr. Hamilton:

The Division of Fish and Wildlife Concurs with the findings and recommendations of the report on the Irondequoit Creek flood control project, Monroe County, New York prepared under the authority of the Fish and Wildlife Coordination Act (16 USC 661).

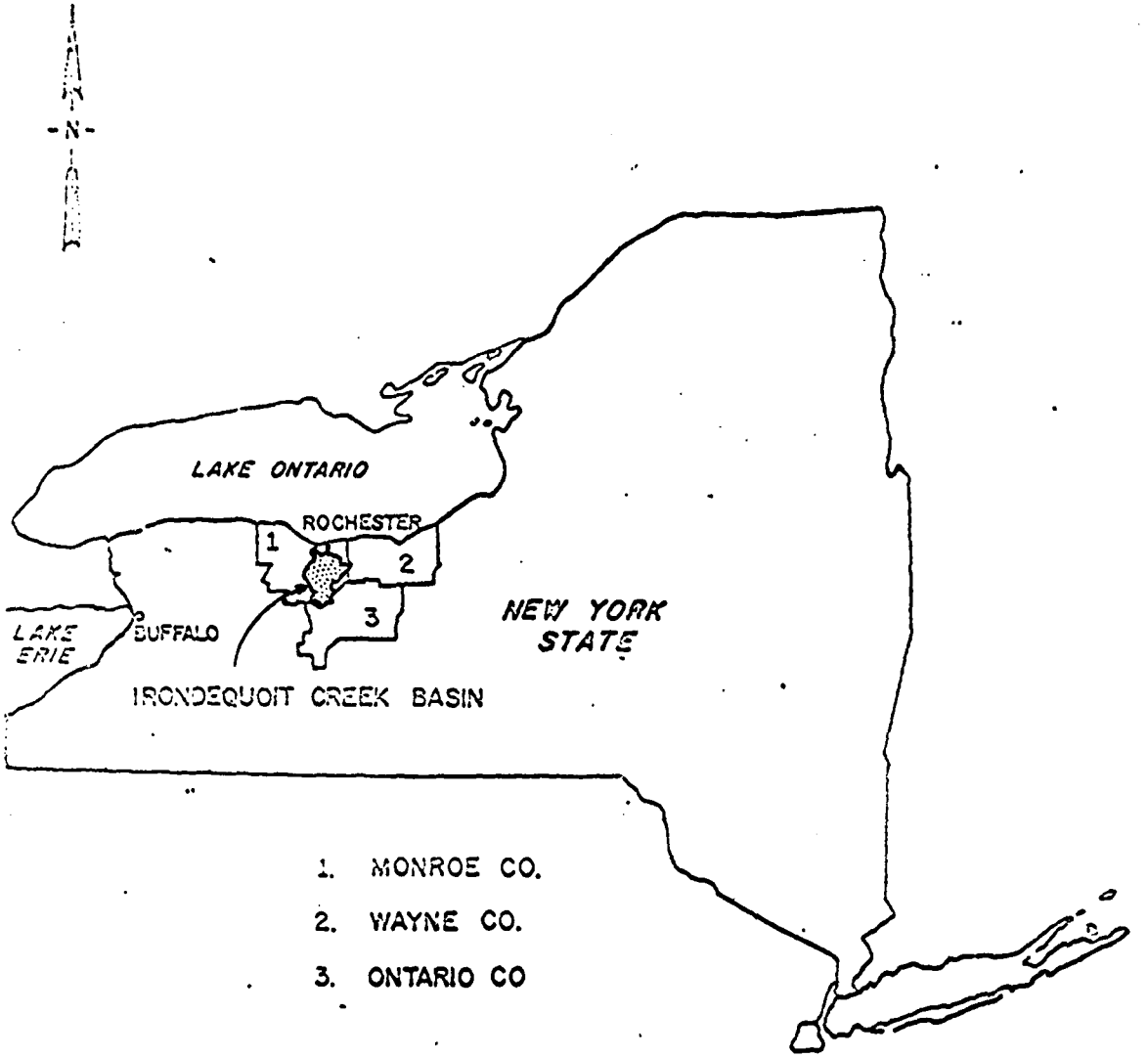
Sincerely,

Edward A. Holmes

Edward Holmes
Regional Supervision
Fish and Wildlife
Region 8

Kenneth Wich

Kenneth F. Wich
Director
Division of Fish and Wildlife



IRONDEQUOIT CREEK WATERSHED
NEW YORK

LOCATION MAP

U.S. ARMY ENGINEER DISTRICT, BUFFALO

figure 1

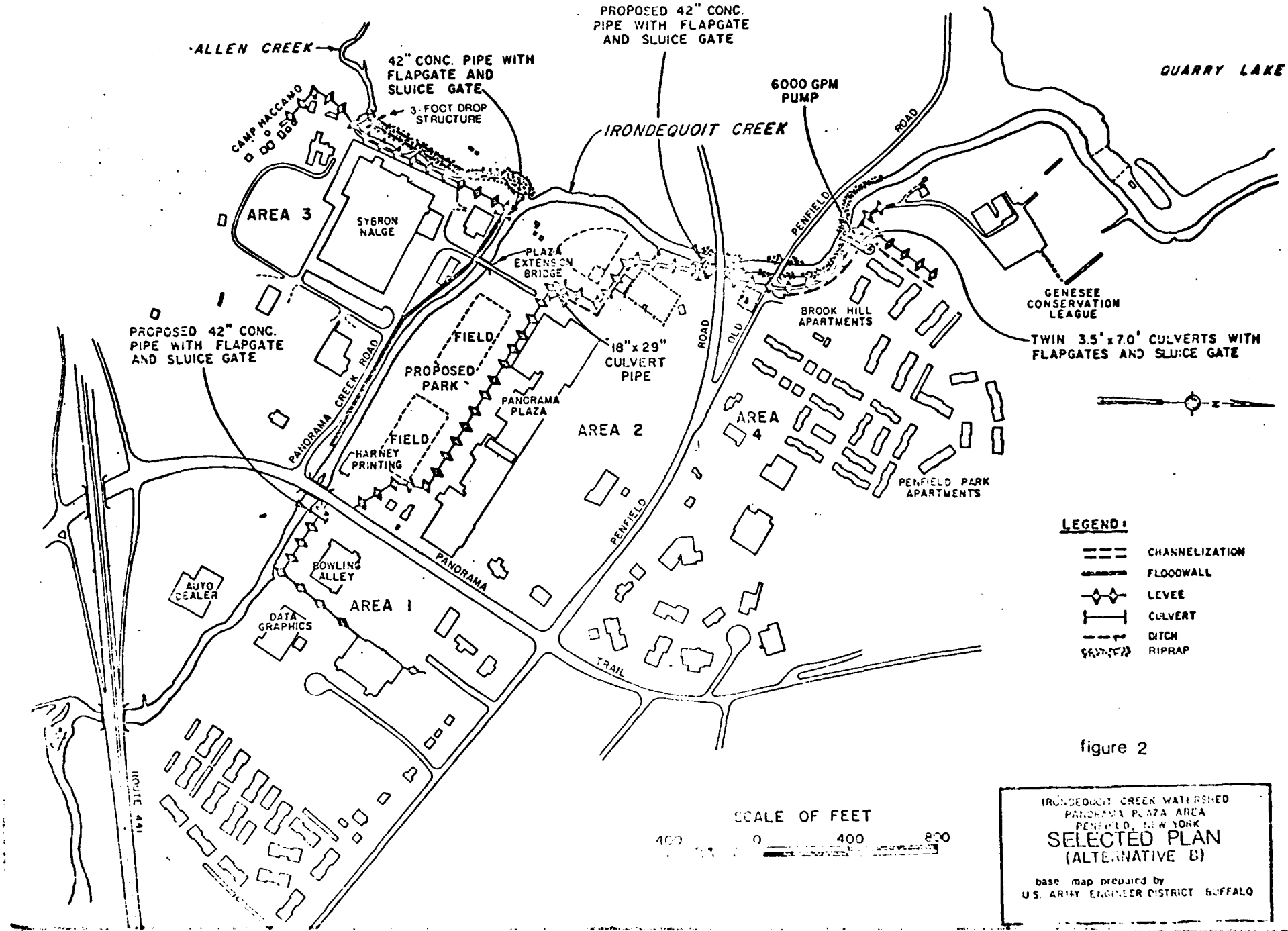


figure 2

IRONDEQUOIT CREEK WATERSHED
PANORAMA PLAZA AREA
PENFIELD, NEW YORK
SELECTED PLAN
(ALTERNATIVE B)

base map prepared by
U.S. ARMY ENGINEER DISTRICT BUFFALO

APPENDIX I

COMMENT/RESPONSE

APPENDIX I

COMMENT REPONSE ON THE DRAFT DETAILED PROJECT REPORT
AND DRAFT ENVIRONMENTAL IMPACT STATEMENT

Date	Comment Letter From	Page
	FEDERAL	
10 Feb 1981	U. S. Department of the Interior - Geological Survey	I-1
4 Mar 1981	Federal Energy Regulatory Commission	I-3
19 Mar 1981	U. S. Department of Agriculture - Soil Conservation Service	I-4
20 Mar 1981	U. S. Department of Housing and Urban Development - Region II	I-6
29 Apr 1981	U. S. Environmental Protection Agency Region II	I-7
1 May 1981	U. S. Department of the Interior - Office of the Secretary	I-8
	STATE	
18 Feb 1981	New York State Governor	I-9
23 Feb 1981	NYS Parks and Recreation	I-10
27 May 1981	NYS Department of Environmental Conservation	I-11
	COUNTY	
31 Mar 1981	County of Monroe - Office of County Manager	I-14
1 Apr 1981	Monroe County Environmental Management Council	I-18
	GROUPS/ORGANIZATIONS/LOCAL AGENCIES	
7 May 1981	Benderson Development Company, Inc.	I-20
	INDIVIDUALS	
29 Apr 1981	Marion Schreiker	I-21
29 Apr 1981	Elinor Osborn	I-22
7 May 1981	Irene L. Gossin	I-24

United States Department of the Interior

GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
521 WEST SENECA STREET
ITHACA, NEW YORK 14850

New York District February 10, 1981

Colonel George P. Johnson
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

We have received draft copies of the final Feasibility Report and Environmental Impact Statement for the Irondequoit Creek Watershed, New York.

The USGS, as part of the ongoing NURP study, has delineated the watershed boundaries for the Irondequoit basin. We enclose a map for your information. The White Brook watershed (which you excluded from the Irondequoit Creek basin) is included in the revised watershed boundary. This watershed drains to Thomas Creek through culverts under the Barge Canal unless the channel becomes clogged with sediment. When the channel is clogged, White Brook backs up and drains to the Barge Canal through a balancing weir east of the Lynden Road bridge. However, this channel will be maintained for the duration of the NURP study. 1

There are several small basins within the watershed which drain directly to the N.Y.S. Barge Canal and are not part of the Irondequoit Creek watershed. These areas are also delineated on the enclosed map.

We noticed that the landfill within the wetland is not included in your floodplain report of 1975. The landfill has modified the channel, creating a "Narrows" which should be considered in routing flood-flows through this area. There is also a combined sewer overflow (CSO) which discharges into the wetland from the Tryon Park area, just downstream from the narrows. This CSO discharges during the smallest event and adds considerable flows during high runoff events. This may also affect flood-routing.

I have included a listing of the major NURP stations in Irondequoit Creek basin. Although these stations would typically be abandoned after the NURP project, they may be of interest to you to provide additional data for future studies.

JOHNNY HORIZON 76

Let's Clean Up America For Our 200th Birthday

U. S. DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY (10 February 1981)

1. Thank you for your review and comments. The additional information is being considered and will contribute to future studies. The corresponding maps in the report have been revised to reflect the change in watershed boundaries. The impact on the hydrology and hydraulics for the proposed Corps project would not be significant to warrant a change to the design.

1 Cont.

1. Irondequoit Creek at Thornell Road
2. Thomas Creek near Fairport (Foreman Center Road)
3. Irondequoit Creek at Linden Avenue
4. Allens Creek near Rochester
5. Irondequoit Creek at Blossom Road
6. Irondequoit Creek at the Wetland Narrows

If you should have any questions, please let me know.

Sincerely,

Richard P. Novitzki

Richard P. Novitzki
Subdistrict Chief

/prr
Encls. 1

cc: District Chief, WRD, Albany, w/o enclosure

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

IN REPLY REFER TO:

March 4, 1981

Mr. George P. Johnson
Colonel, Corps of Engineers
District Engineer
U. S. Department of the Army
1776 Niagara Street
Buffalo, New York 14207

I-3

Dear Mr. Johnson:

I am replying to your request of January 30, 1980 to the Federal Energy Regulatory Commission for comments on the Final Feasibility Report and Environmental Impact Statement on the Irondequoit Creek Watershed. This Feasibility Report and EIS has been reviewed by appropriate FERC staff components upon whose evaluation this response is based.

1 This staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power, natural gas, and oil pipeline industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Thank you for the opportunity to review this statement.

Sincerely,

Jack M. Heinemann
Advisor on Environmental Quality

FEDERAL ENERGY REGULATORY COMMISSION (4 March 1981)

1. Thank you for your review and comment. No response necessary.

United States Department of Agriculture
Soil Conservation Service
U. S. Courthouse and Federal Building
100 South Clinton Street, Room 771
Syracuse, New York 13260

March 19, 1981

Colonel George P. Johnson
District Engineer
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

We have reviewed the Draft Feasibility Report and Draft Environmental Impact Statement for the Irondequoit Creek Watershed, New York, dated January 1981, prepared by the Buffalo District, Corps of Engineers. Copies of this data were received directly from your office and through the Washington Office of USDA. 1

The following are our comments:

(1) The statement on page 27 of the Feasibility Report is not completely accurate stating, "Erosion problems are few and localized....." The localities listed appear to relate principally to streambank erosion. There is a significant amount of sheet erosion in the cropland area of the watershed. Another source of sediment is that resulting from earth disturbing activities related to construction and development.

2 The enclosed Erosion and Sediment Inventory (1974) is an inventory of erosion taking place in New York watersheds at the time of the report. Data is summarized in the report for the Irondequoit Creek Watershed. At the time the report was prepared, some 7,499 acres of cropland showed erosion rates averaging 8.41 tons/acre/year. Normally, on cropped soils in this watershed, erosion rates exceeding three tons per acre per year are considered excessive.

(2) Page EIS-46, paragraph 5.03

3 The statement is made that "Implementation of a watershed management program, therefore, remains as a local responsibility in the Irondequoit Creek Watershed." You may be aware that the Monroe County Soil and Water Conservation District has an ongoing program implementing proper soil conservation practices for all of Monroe County. The same holds true for the Wayne and Ontario Soil and Water Conservation Districts in their respective counties. It would seem logical that these districts be asked to provide a lead role in implementing a watershed management program in the watershed at an accelerated rate.

U. S. DEPARTMENT OF AGRICULTURE (19 March 1981)
SOILS CONSERVATION SERVICE

1. Thank you for your review and comments.

2. This section has been clarified. The localities listed do relate primarily to streambank erosion. This limitation is attributed primarily to the flood-related nature of the study authority; emphasizing investigation of problems and solutions pertaining to flooding or within or involving the floodways. The study of cropland erosion is not within the scope of this study.

3. This statement and section has been clarified. Certainly, the Soil and Water Conservation Districts could provide a leading role in guidance for watershed management in the Irondequoit Watershed. A number of other agencies and programs also exist that provide guidance and management for various aspects of watershed management (e.g., The National Flood Insurance Program, the Nationwide Urban Runoff Program, the Section 208 program, etc.). What this paragraph intended to indicate was that during Stages I and II of the planning process, the Corps investigated existing and past watershed management efforts as well as the possibility of implementing new and unique programs and policies. The implementation of new and unique policies under the Corps study authority, however, did not receive necessary public support. It was therefore indicated, that existing or other future programs/policies would have to provide guidance in watershed management. The Corps, for a number of stated reasons, identified the Monroe County agency responsible for implementing New York State's 208 program as a likely entity to act as a central body for future coordination. See the Summary section of the EIS and the related sections in the Final Feasibility Report.

(3) We note that an assessment of the project impact on prime and unique farmlands has been made and no adverse impact on these lands is forecasted. Included with this memo is a recently released map of Monroe County which shows the locations of prime and unique and important farmlands in the county. This may assist the Buffalo District in its program.

We appreciate the opportunity to review and comment on this statement.

Sincerely,

Paul A. Dodd
State Conservationist

Enclosures
cc: Norman A. Berg, Chief, SCS, Washington, D.C.
Office of Federal Activities (OFA), EPA, New York, New York
Arthur B. Holland, Acting Director, NETSC, SCS, Broomall, Pa.
Warren L. Wittmann, AC, SCS, Batavia, New York
Jamon K. Baker, DC, SCS, Rochester, New York
John J. Rappa, DC, SCS, Canandaigua, New York
Frank J. Winkler, DC, SCS, Sodus, New York

U. S. DEPARTMENT OF AGRICULTURE (19 March 1981) - continued
SOILS CONSERVATION SERVICE

4. Thank you for inclosure of the recently released map. The Corps of Engineers is involved with several projects within Monroe County. This information will be very helpful in future studies.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
AREA OFFICE
107 DELAWARE AVE., STATLER BLDG., MEZZANINE
BUFFALO, NEW YORK 14202

REGION II
26 Federal Plaza
New York, New York 10007

March 20, 1981

IN REPLY REFER TO:
2.1S

George P. Johnson, Colonel
District Engineer
D.O.A. - Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Sir:

Subject: Draft EIS
Irondequoit Creek Watershed
Monroe, Ontario and Wayne Counties, New York

1 This letter is to advise you that we have reviewed subject Draft Environmental Impact Statement. We have not identified any specific deficiencies or conflicts with HUD Programs at this time.

In addition to containing extensive technical information on the watershed, the section on alternative nonstructural solutions is enlightening from an educational perspective for other agencies and the public.

2 We will be pleased to review the Final Environmental Impact Statement when it is published.

Sincerely,

James F. Anderson
Area Manager

cc: Krotenberg, Marvin
Morgan, Russell

U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (20 March 1981)

1. Thank you for your review and comments. No response necessary.

2. Your office is included on the project mailing list and will be sent a copy of the final report.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK NEW YORK 10007

APR 29 1981

Colonel George P. Johnson
District Engineer
Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

LO-1

Dear Colonel Johnson:

We have reviewed the Draft Environmental Impact Statement (EIS) and the Draft Final Feasibility Report for the proposed flood protection plan for the Panorama Plaza Area of the Irondequoit Creek Watershed, Monroe County, New York. As described in these documents, the preferred alternative (Alternative B), the levee/floodwall option, would involve construction of several thousand feet of levees and floodwalls along Irondequoit and Allen Creeks (a tributary of Irondequoit Creek), and would also require channelization of 900 feet of Allen Creek. The following comments regarding the project and its conformance with the Section 404(b)(1) guidelines of the Clean Water Act are offered for your consideration.

I-7

There are no wetlands in the immediate project area. However, aquatic habitat will be adversely impacted by the placement of rip-rap and fill in Allen Creek, and wetlands located downstream of the project area in Irondequoit Creek may be affected by increased sediment loadings during project construction. The Section 404 evaluation included in the EIS indicates that erosion and sediment control techniques will be required during project construction, and that various fish and wildlife protection measures recommended by the U.S. Fish and Wildlife Service will be incorporated into the final project design. Based upon this, the U.S. Environmental Protection Agency concurs with your determination that the project is environmentally acceptable, and we have no objections to its finalization.

In accordance with EPA policy, we have rated this EIS as LO-1, indicating our lack of objections to the project (LO) and the sufficiency of information (1).

Thank you for the opportunity to comment.

Sincerely yours,

Charles M. Terenzio Jr.

Anne Norton Miller, Director
Office of Federal Activities

U. S. ENVIRONMENTAL PROTECTION AGENCY (29 April 1981)

1. Thank you for your review and comments. No response necessary.

United States Department of the Interior

OFFICE OF THE SECRETARY
Northeast Region
15 State Street
Boston, Massachusetts 02109

ER-81/228

May 1, 1981

Colonel George P. Johnson
Buffalo District, Corps of Engineers
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

1 The Department of the Interior has reviewed the January 1981 draft environmental statement and feasibility report (combined) for the Irondequoit Creek Watershed, Monroe and Ontario Counties, New York, and offers the following comments for your consideration.

General Comments

The draft environmental statement and feasibility report adequately addresses most existing resources and describes general project construction impacts. The report also addresses the requirements of other necessary actions having to be in compliance with associated Federal laws and policies.

I-8

2 The concerns expressed in the September 13, 1979, comments from the Fish and Wildlife Service on the preliminary feasibility report have been addressed to our satisfaction. Also, the mitigative measures recommended in the December 16, 1980, Final Fish and Wildlife Coordination Act Report have been adopted into the project plans.

Specific Comments

3 Page EIS-44, paragraph 4.36 - The nature and extend of impacts upon the quarry operations at Quarry Lake should be identified.

4 The report would benefit from the insertion of a paragraph into Section 4 of the environmental statement regarding mineral impacts. This paragraph should relate to mineral commodities and the in-the-ground mineral resources committed to the project, to those mineral resources mentioned on page 20 of the feasibility report.

Summary Comments

5 The Department of the Interior concurs with the recommended plan.

Sincerely,

William Patterson

William Patterson
Regional Environmental Officer

U. S. DEPARTMENT OF THE INTERIOR (1 May 1981)

1. Thank you for your review.

2. Thank you for your comments. No response necessary.

3. These paragraphs have been expanded to describe quarry operations and drainage in the Quarry Lake vicinity, in order to clarify why no significant impacts resulting from implementation of any of the proposed plans would be expected. Existing (pre-project) hydraulic conditions will continue at Quarry Lake which will be implemented through enforcement of flood plain regulations stated in the section, "Division of Plan Responsibilities" in the main report.

4. An additional paragraph pertaining to mineral resources has been inserted into Section 4 of the Revised Draft Environmental Impact Statement. This was previously addressed in more detail in Appendices: A - Cost Estimate, D - Design, E - Geotechnical, and H - 404 Evaluation.

5. Thank you for your concurrence.

STATE OF NEW YORK
EXECUTIVE CHAMBER
ALBANY 12224

ROBERT J. MORGADO
SECRETARY TO THE GOVERNOR

February 18, 1981

Dear Colonel Johnson:

On behalf of Governor Carey, I acknowledge a copy of the Draft Final Feasibility Report and Draft Environmental Impact Statement and associated Appendices, entitled "Irondequoit Creek Watershed, New York" transmitted with your letter of January 30.

Sincerely,

Colonel George P. Johnson
District Engineer
District Corps of Engineers
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

I-9

1

NEW YORK STATE GOVERNOR (18 February 1981)

1. Your receipt of the draft reports is acknowledged. No further response necessary.

STATE OF NEW YORK
PARKS AND RECREATION
ALBANY

ORIN LEHMAN
COMMISSIONER

February 23, 1981

Dear Colonel Johnson:

1 Review of the Irondequoit Creek Watershed Final Feasibility Report and Environmental Impact Statement by my staff produced only favorable comments regarding its thoroughness.

2 Noted particularly was the coordination with the Penfield Town Park plans and possibility of a hiking trail on the top of the levee.

Thank you for the review opportunity.

Sincerely,

Colonel George Johnson
District Engineer
U.S. Department of the Army
Corps of Engineers
1776 Niagara Street
Buffalo, NY

I-10

NEW YORK STATE PARKS AND RECREATION (23 February 1981)

1. Thank you for your review and comment.

2. Coordination pertaining to the Penfield Town Park plans will continue. However, because of concerns expressed by the local sponsor, the county, in-house personnel, and others, utilization of the levee for recreational purposes will not be encouraged. Such utilization would lead to significant maintenance, and some safety problems. In addition, significant abuse of the structure could jeopardize its reliability.

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233
Division of Regulatory Affairs, Room 514

Robert F. Flacke
Commissioner

May 27, 1981

George P. Johnson, Colonel
District Engineer
Department of the Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

RE: Final Feasibility Report and
Environmental Impact Statement,
Irondequoit Creek Watershed,
DEC #828-99-0080.

I-11

Dear Colonel Johnson:

The State of New York has completed its review of the above-mentioned document. It has been determined that the document adequately addresses those environmental issues of concern to the State and we support the Corps selection of Alternative B as the recommended plan.

1 Alternative B is a levee/floodwall plan designed with a selected 500-year level of protection. The plan will include the incorporation of environmental and recreational enhancement measures into the completed project. Alternative B will have a beneficial affect on the area in that it will reduce the damage that has resulted by recurrent floodings.

The State appreciates the opportunity for review and comment. We request the opportunity to review the final document when available. Comments to the document are included.

Very truly yours,

Louis M. Concra, Jr., Director
Division of Regulatory Affairs

LMC:ERM/ssf

cc: J. Corr, E. Wagner, D. Konsella, D. Blazer, T. Smith (DOT), file.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (27 May 1981)

1. Thank you for your review, comments, and concurrence. You will receive copies of the final documents when they are available.

COMMENTS

Hydrology

The 100-year discharge rate used in the Final Feasibility Report (FFR) is considerably less than the 100-year discharge rate presented in the earlier Floodplain Information Report and the Flood Insurance Study. The hydrologists that prepared the FFR have carefully analyzed the watershed and believe they have derived the correct discharge figures. It is their opinion that hydraulic losses in the watershed were not accurately accounted for in previous studies. New York State does not disagree with the new values. Presently, the hydrological analysis is being reviewed at the Division level of the Corps of Engineers.

2

If the Division level supports the District analysis, we recommend that the Federal Emergency Management Agency be notified since the flood insurance mapping will require revising throughout the Irondequoit Creek Watershed. Revising the 100-year water surface profile downward reflecting the decrease in the 100-year discharge rate should result in substantial savings in flood insurance premium costs and may have an impact on future development.

Design

Concerns have been expressed regarding the incorporation of two old culvert structures presently used as pedestrian crossings only, into the project as hydraulic control structures. It has been determined, however, that the project will function as designed with or without these structures in place. During the interim period prior to their removal, the design discharge capacity of the project will not be affected in the event the culverts become blocked by debris.

3

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (27 May 1981)-Continued

2. The Federal Emergency Management Agency will be notified. Their regional office is included on our coordination mailing list. No further response required.

3. Hydraulic comments are correct. Of the two structures in question, however, one is a culvert structure (the Panorama Plaza extension bridge), the other is a truss bridge (the Old Penfield Road Bridge). Both bridges presently provide vehicular access. Implementation of Alternative Plan 8 - Levee/Floodwall would not require the removal of the Plaza Extension bridge or the Old Penfield Road bridge. Vehicular traffic would be discontinued over the Plaza Extension bridge. A pedestrian gate, however, would be installed in the floodwall along the left bank at the Plaza Extension bridge allowing pedestrian access to the bridge, park, and plaza. Pedestrian access ways would be provided over the levee on the plaza side of the bridge also. Vehicular access over the levee will be provided only for maintenance purposes. Draft reports provide for the Old Penfield Road bridge to remain with pedestrain access only. Further consideration however, will be given to the feasibility/possibility that vehicular traffic would be maintained under normal (non-flood) conditions but would be temporarily detoured during flood conditions. The details for this will be determined in development of detailed plans and specifications. Adequate alternative access routes are available for any alternative. Any replacement of these structures, at a later date, could be with smaller pedestrian crossings. Refer to alternative plan descriptions and EIS.

3 Cont. Replacement of the old culvert structures at a later date with smaller pedestrian crossings will not impair project discharge capacity or its structural integrity as outlined by the Corps hydrologists.

4 The State recommends that the use of the levee for a hiking trail and as natural bleachers should be discouraged and that the Final EIS reflect concerns for the problems faced by the maintaining agency, the Town of Penfield.

Maintenance

The State fully supports the following maintenance scheme to be required by the Corps of Engineers:

1. Irondequoit Creek, left in its natural state, will function as designed. However, debris that accumulates in its channel will have to be removed by the maintaining agency.
2. Shoaling at the confluence of Irondequoit Creek and Allen's Creek or anywhere in the project reach will have to be removed when it becomes a problem hydraulically or threatens a component of the flood control structures. The COE has agreed to consider working a threshold level into the Operation and Maintenance Manual that would trigger removal of shoals by the maintaining agency.
3. The improved channel along Allen's Creek must be maintained free of woody growth. We recommend that the banks be stabilized with goby-matts or similar material other than the standard type of rock rip-rap. It is also necessary that a clear area at least 15 feet wide be maintained along the top of both banks for equipment access.
4. In the area of the proposed park, hydraulic design of the project anticipates that the park will be mowed. If the park should not be developed, it will be necessary for the maintaining agency to mow the area at least once a year to keep the brush from developing.

I-13

5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (27 May 1981) - Continued

4. With respect to expressed concerns for costs, safety, structural reliability, and maintenance problems; use of the levee for a hiking/biking trail and as natural bleachers will not be encouraged. The Final EIS will reflect concerns for the problems faced by the maintaining agency, the Town of Penfield.

5. During the preparation of the Phase I and Phase II General Design Memorandums, the operation and maintenance procedures will be determined. With respect to maintenance item 3, maintenance requirements need to be integrated with environmental mitigation measures in development of Detailed Plans and Specifications. No further response required.

County of Monroe
Office of County Manager
110 COUNTY OFFICE BUILDING
ROCHESTER NEW YORK 14614

LUCIEN A. MORIN
COUNTY MANAGER
DIRECTOR OF FINANCE

March 31, 1981

Colonel George P. Johnson
District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Johnson:

Subject: Review of Irondequoit Creek Watershed Final Feasibility Report and Environmental Impact Statement

1 Thank you for the opportunity to review the above-mentioned report. It has been reviewed by several county agencies and their comments are presented in the attached statement which I am requesting be included in the public record.

The report recommends a course of action for minimizing the frequency and severity of flooding in the Irondequoit Creek Watershed. This includes constructing a series of levees and floodwalls near Panorama Plaza in the town of Penfield and carrying out several non-structural flood control measures in the remainder of the watershed. In general, Monroe County supports the recommendations in the report. The draft environmental impact statement recognizes, for the most part, the extent of impacts associated with the recommended plan and identifies appropriate mitigation measures. We do, however, feel that
2 the Corps of Engineers' study should be better coordinated with the major federally funded water quality study which is underway in the Irondequoit Creek Watershed. This study, funded under the Nationwide Urban Runoff Program, will investigate several measures to control surface runoff pollution, including constructing a series of small-scale reservoirs in the Irondequoit Creek Watershed. The Corps of Engineers study should give greater consideration to water quality improvements being investigated in the NURP study, such as the reservoirs, which could improve water quality and provide recreational as well as flood control benefits.

3 Also, implementing the flood control improvements recommended in the report depends in part on non-federal participation. It is important that the report propose specific responsibilities and contributions of each level of government participating in the project, especially those related to the constructing and maintenance of the structural improvement near Panorama Plaza.

4 These comments and others are discussed in greater detail in the attachment. Once again, thank you for the opportunity to review the Irondequoit Creek Watershed Flood Control Study, and if you have any questions on these comments,

I-14

COUNTY OF MONROE (31 March 1981)
COUNTY MANAGER

1. Thank you for your review and comments. Comments are incorporated into this section of the Final Feasibility Report for the public record.

2. See reply comment 5.

3. See reply comment 6.

4. See reply comments 5 through 9.

please contact Don B. Martin, County Director of Planning at (716) 428-5475.

4 cont.

Sincerely,

Lucien A. Morin
County Manager

LAM/cm
Attachment

xc: Don B. Martin, Director, Monroe County Department of Planning
Dr. Joel Nitzkin, Director, County Health Department
Gerald McDonald, Director, County Department of Engineering
John Davis, Acting Director, County Department of Wastewater Management
Anna Bundschuh, Supervisor, Town of Penfield
Robert Jonas, Chairman, Irondequoit Basin Water Quality Advisory Committee
Eric Seiffer, Director, New York State Department of Environmental Conservation - Region 8, Avon
Gerald Rider, NURP Project Director, New York State Department of Environmental Conservation, Albany
Allan Buddle, New York State Department of Environmental Conservation Flood Control Office, Elmira
William Kappel, U. S. Geological Survey, Ithaca

COMMENTS BY MONROE COUNTY ON THE BUFFALO DISTRICT, CORPS OF ENGINEERS
IRONDEQUOIT CREEK WATERSHED
FINAL FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT

1. We feel that this project does not fully consider a major federally funded water quality study which is being conducted in the Irondequoit Creek Watershed. The County of Monroe and the State of New York Department of Environmental Conservation (DEC) are involved in one of 30 Nationwide Urban Runoff Program (NURP) studies being conducted across the country to determine the significance of and ways to control pollution from urban runoff. The NURP study is funded by the U.S. Environmental Protection Agency (EPA). The coordination and integration of the NURP study and the flood control study must be given greater attention in the Corps of Engineers report so that limited federal resources can more efficiently be used to achieve multiple benefits for the entire Irondequoit Creek watershed. One of the pollution control measures which will be evaluated as part of the NURP study is the construction of small-scale reservoirs in the Irondequoit Creek Watershed. These reservoirs could have multiple benefits by improving water quality as well as serving as flood control structures. While the Corps of Engineers report does consider a series of upstream reservoirs for flood control, its benefit/cost analysis does not consider the water quality and recreational benefits associated with such structures. Therefore in order to obtain an accurate picture of all potential benefits, we recommend that the final Corps of Engineers report include a broader evaluation of the reservoir option. To help in this evaluation, data on the following would be useful:

5

a. Would any combination of reservoirs significantly reduce flood discharges in the Panorama Plaza area or other problem areas? If so, approximately how much reduction would occur?

b. Approximately how much difference would that make in the estimated costs of the proposed project?

c. What would be the approximate costs to construct the reservoirs?

I-16

With this information, it would be easier to determine whether or not multi-purpose reservoirs could be justified. To obtain more information on the water quality benefits of multi-purpose reservoirs or on the NURP study in general, please contact Mr. Jerry Rider, New York State Department of Environmental Conservation, 50 Wolf Road, Albany, New York 12233, or Mr. Robert Gallucci, NURP Project Manager, Monroe County Department of Engineering, Rochester, New York 14614.

2. The report is unclear as to the division of responsibilities for implementing the recommended plan. The role and responsibilities of the State Department of Environmental Conservation (DEC), Monroe County and the towns in the watershed should be determined as soon as possible. This is especially important with regard to the non-federal costs and on-going maintenance responsibilities associated with the structural improvements at Panorama Plaza in the town of Penfield. Since the benefits of the proposed Panorama Plaza structural improvement are local in scale and will not have an intermunicipal impact, it would not be appropriate that Monroe County bear the

6

COUNTY OF MONROE (31 March 1981) - Continued
COUNTY MANAGER

5. Coordination with pertinent agencies and consideration for ongoing studies/programs is an important aspect of the Corps planning process. However, with respect to the number of agencies, programs, studies, etc. generally pertaining to or with interest in Corps investigations, adequate coordination sometimes appears or may indeed be insufficient.

Reference the NURP Study. This program is primarily oriented to addressing issues of water quality while the Corps General Investigation study is oriented towards flood damage reduction. Corps regulations mandate that water parameters be addressed and measures taken to prevent increased degradation of water quality but specific established Corps study parameters limit investigative consideration, spending, and duplication of work.

Although the Corps Study Authority pertains primarily to flood damage reduction, a great deal of consideration was given to environmental issues (including water quality) in formulation of alternative plans. Both the U. S. Fish and Wildlife Service and NYS Department of Environmental Conservation - Environmental Section were coordinated with and contributed considerably in plan formulation. This is particularly evident in the proposed plan for the Panorama Plaza vicinity where levees are set back to protect the riparian environment, and environmental enhancement measures are incorporated where channelization is necessary. Impacts to water quality would be short-term and temporary, occurring primarily during construction when all possible environmental protection measures will be incorporated in accordance with the Corps Civil Works Construction Guide Specification Environmental Protection - EW 01430. Further consideration, however, will be given to water quality improvements being investigated in the NURP Study to help insure that planning conflicts do not occur or are minimized.

Although further coordination and investigation pertaining to the NURP Study will be considered, it is not anticipated that such coordination would alter the consideration/findings of this study. Reservoir alternatives were considered in some detail during Stage II of the Corps planning process pursuant to the General Investigation study authority. Although some potential recreational and water quality benefits might be obtained from the reservoir alternative, they were justifiably eliminated from further investigation, because it was determined that they could not contribute significantly to flood damage reduction in the watershed; the primary reason being the limited reservoir capacities. In addition, the cost of constructing one reservoir or several in series would not be economically justifiable for flood control purposes. Any additional investigations in excess of those performed pursuant to the General Investigation authority would have to be pursued under alternative authorities.

6. The Federal and non-Federal division of responsibility and costs is fairly well defined. The non-Federal's are responsible for acquiring all lands, easements, and rights-of-way; cost for utility relocation; and maintenance costs. The local sponsor - in this case, the New York State Department of Environmental Conservation in coordination with the Corps - is primarily responsible for negotiating/defining the non-Federal responsibilities and cost-sharing. New York State Department of Environmental Conservation develops participation agreements with the local governments, as appropriate. This generally occurs in the period between review of the draft and final reports. The county will be asked to participate in these determinations and detailed cost-sharing will be determined before detailed plans and specifications are completed.

AD-A115 849 CORPS OF ENGINEERS BUFFALO NY BUFFALO DISTRICT F/G 13/2
IRONDEQUOIT CREEK WATERSHED NEW YORK, FINAL FEASIBILITY REPORT --ETC(U)
MAR 82

UNCLASSIFIED

NL

END
DATE FILMED
7-82
DTIC

costs and responsibilities associated with this improvement. In any event, the non-federal costs and responsibilities of implementing the entire recommended plan should be determined before the report is finalized. Monroe County is willing to participate in any meeting aimed at determining these responsibilities.

6 cont.

3. If a recreation trail is planned as part of the proposed park behind Panorama Plaza, it should take into account scenic and public safety considerations. A trail on top of a levee that slopes off into concrete culverts has the potential of being unsafe, especially if children will be biking on it. A preferable alternative might be locating the trail along the banks of the creek. This would be safer and more scenic. Monroe County will be glad to work with the Corps of Engineers and the Town of Penfield in reviewing the park design as it relates to the proposed levees/floodwalls as part of detailed project planning.

7

4. The watershed boundary should be revised. The following changes should be made: White Brook, which drains into Thomas Creek, should be included in the watershed; and an area south of the Barge Canal in the village and town of Pittsford should be excluded from the watershed since it drains into the Barge Canal. These changes should have no appreciable effect on the conclusions of the report. For more information, please contact William Kappel, U.S.G.S. - Ithaca at (607) 272-8722.

8

5. Two county facilities - a sanitary interceptor sewer and a related chemical feed building - would be located within the levees/floodwalls proposed near Panorama Plaza. The draft Environmental Impact Statement should discuss impacts to these facilities in its analysis of damage to public utilities from the proposed structural improvement. The sanitary sewer could be affected by flood waters entering manhole covers. Also, safe vehicular access must be maintained to any manholes which fall within the proposed levee/floodwalls. The Pure Waters chemical feed building stores sodium nitrate in dry bag form and liquid sodium hypochlorite in a 3000 gallon below grade tank. This building normally operates during the dry weather periods only. However, flood waters could potentially damage pumps, motor mixing equipment and electrical switch gears. Also the stored sodium nitrate, if damaged, could pollute Irondequoit Creek. Therefore, the Corps of Engineers report should consider options and costs to [illegible] relocate the chemical feed building. If the building is not relocated, safe and easy access must be maintained. For more information on the county sewer facilities, please contact John Davis of the County Department of Wastewater Management at 428-5577.

9

I-17

COUNTY OF MONROE (31 March 1981) - Continued
COUNTY MANAGER

7. Utilization of the levee for recreational purposes was considered during plan formulation and in the draft reports. Because of continuing significant concerns pertaining primarily to maintenance costs, structural reliability, and health and safety, this utilization will not be incorporated or encouraged in the final plan. Aesthetic and health and safety factors will continue to be important considerations in the Corps planning process, and the Corps will continue to coordinate its planning efforts with Monroe County.

8. The watershed boundary has been revised. This will have no appreciable effect on the conclusion of the report.

9. Floodproofing measures have been proposed for these facilities. In the Draft Final Feasibility Report (January 1981) Appendix A, costs for waterproofing the manholes of the sanitary sewer interceptor were included in the total cost estimate for the selected plan. A cost estimate for waterproofing the pure water chemical feed building will be included in the Final Feasibility Report. Specific detailed plans will be prepared in the design phases after authorization.

MONROE COUNTY
ENVIRONMENTAL
MANAGEMENT
COUNCIL

JAMES K. NOLEN, Chairman
ANN B. NELSON, Program Coordinator
STEPHEN MURPHY, Environmental Engineer
CHARLES R. O'NEILL, JR., Procedures Analyst

Executive Office Building, 10 North Fitzhugh Street, Rochester, New York 14614/Phone: (716) 428-5745

April 1, 1981

David R. MacPherson
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Mr. MacPherson:

The Monroe County Environmental Management Council has reviewed the draft final feasibility report and draft environmental impact statement for flood control in the Irondequoit Creek watershed.

1 In general, we believe this is a valuable document. All of the significant flood problem areas have been identified, a variety of management alternatives have been considered, and the proposed measures are fairly well supported by the information and the analysis. We are particularly impressed by the thoughtful design of the proposed levee/floodwall project in the Panorama Plaza area. The Corps obviously made a strong effort to preserve the character of Irondequoit Creek and to minimize the adverse effects of changes to Allen Creek.

2 However, the report could be improved. There was a great deal of extraneous information and far too much redundancy which made the report much more difficult to read. There were also many errors in the extraneous information. We realize that the Corps is trying to be comprehensive, but presenting information this way causes confusion and the errors leave the entire report open to suspicion. We strongly recommend that you try to present a simple statement limited to relevant information. It may also be worthwhile to bind the appendices separately.

3 The watershed boundaries need to be corrected. White Brook passes through a culvert under the Barge Canal and joins Thomas Creek, so the area it drains should be included in the watershed. There are also several streams that originate in the Town of Pittsford, pass through the Village of Pittsford, and empty into the Barge Canal (Streams numbered 0-108-P-113-3-13, -3-13-2, -3-13-2a, and -3-13-3). The area drained by these streams should be removed from the watershed (Either the Ithaca office of United States Geological Survey or we can supply the correct boundaries.). Of course, these changes will require revision of the flood discharge analyses.

4 Additional information about the alternative of reservoir construction would also be worthwhile. The comparison of available storage to required storage for various rainfalls was not particularly helpful. The following would be more useful:

MONROE COUNTY ENVIRONMENTAL MANAGEMENT COUNCIL (1 April 1981)

1. Thank you for your review and comments.

2. The Corps of Engineers generally agrees with your comment, and efforts will be made to alleviate some of the problems in the final reports. Part of the problem may be attributed to: (1) the content requirements of the report sections and appendices. Many of the Appendices are designated for particular reviewers, must address specific parameters, and often must be self-sustaining; (2) efforts to address the issue concerns of the many agencies and interests that review these reports; (3) limited time for and effects of continual review and revision.

Generally, on Corps studies, the main report and appendices are bound separately, but in this case, were combined to facilitate reproduction, distribution, and coordination.

3. The watershed boundary has been revised. This will have no appreciable effect on the conclusion of the report as investigated by our hydraulics and hydrology sections.

4. Reservoir alternatives were considered in some detail during Stage II of the Corps planning process pursuant to the General Investigation study authority. They were eliminated from further investigation under this authority because it was determined that reservoirs could not contribute significantly to flood damage reduction in the watershed; the primary reason being the limited reservoir capacities. In addition, the cost of constructing one reservoir or several in series would not be economically justifiable. Correspondingly, the reservoir alternatives were not presented in detail in the Draft Final Feasibility Report and Draft Environmental Impact Statement, Stage III Planning documents.

1. Would any combination of reservoirs significantly reduce flood discharges in the Panorama Plaza area or other problem areas? If so, approximately how much reduction would occur?

4 cont.

2. Approximately how much of a difference would that make in the estimated costs of the proposed project and how much benefit would other areas receive?

3. What would be the approximate costs to construct the reservoirs?

With this information, one could determine the cost that would have to be attributed to purposes other than flood control for a multipurpose reservoir.

Thank you for the opportunity to comment.

Sincerely yours,

James K. Nolen

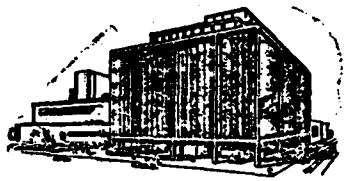
James K. Nolen
Chairman

jnb

4-9

BENDERSON

DEVELOPMENT COMPANY, INC.



COMMERCIAL and INDUSTRIAL PROPERTIES • OFFICES • PLAZAS • APARTMENTS • MOTELS

570 Delaware Avenue
Buffalo, New York 14202
716-886-0211

• AMONG OUR CLIENTS

A & P Tea Company
A. B. Dick Company
Addressograph-Multigraph Corp.
Allegheny Ludlum Steel Corporation
Allis-Chalmers
Allstate Insurance Company
America Fore Loyalty Group
American International Banking Corp
American Motors Company
Armour - Dial
Bankers Life Insurance Co
Bankers Trust
Bank of Buffalo
B. F. Goodrich Company
Bethlehem Steel Corporation
Burger King
Burroughs Corporation
Carborundum Company
Carrier
Chase Manhattan Bank
Chevrolet Motor Division
Chicago Pneumatic Tool Company
Dannon Milling & Grinding Company
Dean Witter & Company
Dentsply Products Sales Company
Dominion Foundry Package Mfg. Company
Dunn & Bradstreet, Inc
Endicott-Johnson Company
Fairchild Corporation
Fireman's Fund Insurance Company
First Investors Corporation
Fisher Body Company
Ford Motor Company
Fram, Inc.
Gibson Greeting Cards, Inc
Goodyear Tire Company
Grand Union Company
Holiday Inns of America
Huron Portland Cement Company
I B M
Interstate United
Kaiser Aluminum & Chemical Corp.
Kemper Insurance

May 7, 1981

Department of Army Corps of Engineers
1776 Niagara Street
Buffalo, New York

Re: Panorama Flood District
Penfield, New York

To Whom It May Concern:

This letter is being written in compliance with the ten day limitation requirement for the public to respond to the Corps of Engineers planned development in the area.

In as much as I haven't the appropriate names of the individuals I have addressed this accordingly.

1.) First of all I would like to express the position of Panorama Plaza as being anxious and in favor of any type of flood prevention for the safety of lives and property.

2.) We feel however, that the current contribution is inadequate and should be proportionately expanded.

3.) We would like to go on record as being opposed to the method being proposed for the distribution of the cost of maintenance of this berm.

Thank you for this opportunity to express our views on this matter.

Very truly yours,

BENDERSON DEVELOPMENT COMPANY, INC.

Jack Chesbro

Jack Chesbro

JC/mkm

cc: Town of Penfield

Chuck Costich

planning • location • leasing • construction • financing

BENDERSON DEVELOPMENT COMPANY, INC. (7 May 1981)

1. Thank you for your comments.

2. Allocation of responsibility for construction and maintenance costs and operations is seldom easily resolved. The Federal and non-Federal division of responsibility and costs however, are based on construction and maintenance costs used for other similar projects. The non-Federal's are responsible for acquiring all lands, easements, and rights-of-way; cost for utility relocation; and maintenance. The local sponsor, the New York State Department of Environmental Conservation (DEC), is primarily responsible for negotiating/defining the non-Federal responsibilities and cost-sharing. The New York State Department of Environmental Conservation develops participation agreements with the local governments, as appropriate. This generally occurs in the period between review of the draft and final reports. Cost-sharing programs are being investigated by DEC and a determination will be made before a letter of intent of assurance is sent by DEC to the Corps. DEC will be responsible for estimating the final expected maintenance cost upon construction of the project and will designate responsibility for the maintenance aspects.

rcd 5/12/81

IRONDEQUOIT CREEK WATERSHED STUDY
29 APRIL 1981 PUBLIC MEETING

Comment Sheet

The purpose of this comment sheet is to offer you an opportunity to comment candidly on the proposed alternatives to provide flood damage reduction measures for the Irondequoit Creek Watershed. Please state if the statement is your opinion or if it represents the position of your community/organization. The Corps, Buffalo District, will use this information to document concerns that will be addressed during the revision of the final feasibility report and environmental impact statement.

I-21

This appears to be a good study and I agree that the selected plan is the best potential. The Corps will be complimented.

I know that this type of development (Circles are individual markers for trees showing the results of the development on flood flows or potential flood plain for the proposed 10 year study) may be presented in the future.

Name/Title Thomas J. Schneider, Municipal Engineering Director

From: Town/Organization/Individual Town of Webster N.Y.

Address 412 Redlands Lane

Webster N.Y. 14580
Zip Code

MARION F. SCHREIKER (12 May 1981)

1. Thank you for your comments. No response necessary.

April 29, 1981

US Army Corps of Engineers--Panorama Plaza Project

I oppose the project for the following reasons:

1. tremendous cost--nearly $4 million to build. $350,000 per year to maintain at 1980 prices
the cost of the study has not been added in
any additional building will mean more federal flood insurance, subsidized by taxpayers since rates are much lower than commercial rates

2. this project may encourage more building as indicated on page 22 of the EIS. However on page 48 of the full report it is stated that no more development should occur. There are proposals now to add buildings in Panorama Plaza itself. The area of Mort's Farm Market may be a spot where more development may be planned.

3. aesthetics--rip-rap, levees, flood walls, clearing of vegetation, drainage ditches on this side of the levees are not aesthetic

4. If a flood should top the levees it is made worse by being held away from the creek by the levees

5. concerns from the US Fish and Wildlife Dept. convince me that fish and wildlife may be adversely affected

Elinor Osborn
91 Coachman Drive
Penfield, NY 14526

I-22

ELINOR OSBORN (29 April 1981)

1. Based on March 1981 price estimates:

Construction and First Cost - Alternative B - 500-Year

Total Federal Cost	$3,312,000
Total Non-Federal Cost	1,588,000
Total First Cost	$4,900,000
(Total Average Annual Cost	$456,700)

Estimated Maintenance Cost

Federal	10,200
Non-Federal	74,500*
Total	$ 84,700

* Final actual amount to be estimated by the non-Federal local sponsor after project construction.

The cost of the study is not included into the cost of project. The project cost is strictly for final engineering, design, and construction.

In the cases of local flood control protection projects, projects that give 100-year degree of protection or greater, are taken out of the flood plain and, therefore, are not required to have flood insurance (Reference 29 April 1981 public meeting minutes).

2. Flood protection measures may induce incentive for development in the protected area. Development however, is still dependent upon other factors as well, such as location, costs, transportation, etc. In the Panorama Plaza vicinity (project area), there is relatively little open space available for further significant development.

The Corps of Engineers is aware of several proposals for developments in the vicinity. Most are expansions of existing buildings. Appendix B, page B-9, provides further details of projection of land use.

3. Both adverse and beneficial aesthetic impacts could occur as a result of the project (Reference the aesthetics section in the EIS). Aesthetics has been and will continue to be a reasonably important consideration of the project.

4. The internal drainage system outfalls would be closed during flood stages to prevent backflow into the protected area. The water trapped inside the protected area would drain back into the creek after the flood stage/levels had past. During nonflood conditions, the internal drainage system outfalls are open, and water runoff from the protected area drains into the creek. Although the project is designed for a 500-year occurrence, an emergency flood warning system would be provided as a part of the project to allow emergency agencies ample time to evacuate people in the flood plain during very high flood stages that may have the potential to overtop the levees/ floodwalls.

5. Adverse impacts to fish and wildlife would occur primarily during the *construction period. These are primarily* unavoidable and would be short term and less damaging then the other proposed alternatives while still providing desirable flood protection. Long-term effects are expected to be beneficial in these regards. (Reference the EIS, etc.)

A great deal of consideration was given to environmental issues in formulation of alternative plans. The levee/flood walls were set back to protect the existing riparian environment and mitigation/enhancement measures were incorporated where channelization was necessary. The project was coordinated in considerable detail with both the U.S. Fish and Wildlife Service and the New York State Department of Environmental Conservation - Environmental Section to address and mitigate their concerns. Both agencies have endorsed the project.

17 Parkview Drive
Rochester, New York 14625
May 6, 1981

Colonel George P. Johnson
District Engineer
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

RE: Irondequoit Creek Watershed
Final Feasibility Report

Dear Colonel Johnson:

Pursuant to my oral comments at the April 29th public meeting at Penfield High School I wish to offer the following written remarks. 1

The selected plan calling for the construction of levees and floodwalls (Alternative B) is not in the best interests of the local governments and the State of New York because of the high cost of construction and the additional high cost of annual maintenance. The cash contribution required of the non-Federal interest at the time of construction and the subsequent requirement that the non-Federal interest assume the responsibility for maintenance would fall most heavily upon the Town of Penfield. The cost of maintenance alone would be in the range of $60,000 annually. As the former Supervisor and chief fiscal officer of the Town of Penfield, I must state flatly that the Town cannot and should not assume such a burdensome annual obligation. Supervisor Bundschuh's suggestion that a special district be created to bear the annual costs would legally require an affirmative vote and is not likely to succeed for the reason that the charges apportioned to the so-called "benefited" properties would be rejected as being exorbitantly expensive. 2

I-24

To make matters worse, as you revealed at the meeting, final costs have not too surprisingly increased already by $900,000. It can be expected that by the time the project were to be authorized and construction begin, costs would have again increased greatly thus bringing the benefit-cost ratio down below the present 1.7 ratio. 3

As I expressed at the meeting, I have deep concern that this project and the current Urban Runoff study (both Federally funded) which is designed to prevent the pollution of Irondequoit Creek are at cross purposes. A large structural project such as the one proposed, which would cause a loss of water quality due to sedimentation and turbidity, would be counter-productive to the goals of the Runoff study. It is my suspicion that coordination between the two studies has been less than satisfactory. 4

The Feasibility Report (Appendix B 9 and 12) states incorrectly that there will be no future development of the Panorama Plaza flood plain. Although such is to be fervently desired, there has been, in fact, an application before the Town for four (4) additions to the Plaza. The correction should be so noted. 5

IRENE L. GOSSIN (6 May 1981)

1. Thank you for your review and comments.

2. The feasibility study report identifies the levee/floodwall plan (Alternative B) as the selected plan for the Panorama Plaza vicinity based on its performance in addressing the most significantly identified public concerns and its net positive contribution to the goals of National Economic Development (NED) and Environmental Quality (EQ).

Allocation of responsibility for construction and maintenance costs and operations is seldom easily resolved. The Federal and non-Federal division of responsibility and costs however, are based on construction and maintenance costs used for other similar projects. The non-Federal's are responsible for acquiring all lands, easements, and rights-of-way; cost for utility relocation; and maintenance costs. The local sponsor, the New York State Department of Environmental Conservation (DEC), is primarily responsible for negotiating/defining the non-Federal responsibilities and cost-sharing. This however, is not determined until a number of Federal and non-Federal (sponsor) assurances are secure. This generally occurs in the period between review of the draft and final reports. Cost-sharing programs are being investigated by DEC and a determination will be made before a letter of intent of assurance is sent by DEC to the Corps. DEC will be responsible for estimating the final expected maintenance cost upon construction of the project and will designate responsibility for the maintenance aspects.

3. The initial cost of construction will increase with time. Project construction would be cheaper now than later. The benefit-cost ratio, however, would not necessarily change significantly because both additional costs and benefits will increase. The $900,000 increase is due to a reevaluation of real estate. Price updates resulted in only a less than $100,000 increase. The price increases were only approximate, the actual revised prices can be found in Appendix A of this report.

4. Coordination with pertinent agencies and consideration for ongoing studies/programs is an important aspect of the Corps planning process. However, with respect to the number of agencies, programs, studies, etc. generally pertaining to or with interest in Corps investigations, adequate coordination sometimes appears to be insufficient.

With respect to the NURP Study, a seemingly lack of consideration of this program may in part be attributed to the primary differences in purpose orientation of the study authorities. While the NURP Study is oriented to address primarily issues of water quality, the Corps General Investigation study is oriented to address primarily flood damage reduction. Correspondingly, specific study parameters are established which limit investigative considerations, spending, and duplication of works.

A great deal of consideration was given to environmental issues in formulation of alternative plans, including water quality. The levee/floodwalls were set back to protect the existing riparian environment, and mitigation/enhancement measures were incorporated where channelization was necessary.

There can be no question that protection for the Panorama Plaza area is needed. The question is how will that protection be provided. Surely the no-action alternative which relies on flood warning, floodproofing, evacuation, flood insurance and flood plain regulation is not acceptable - particularly in a town where regulation is not stringently enforced.

Since the Panorama flood plain lies at the foot of the watershed with flood water originating upstream through Thomas Creek, Allen's Creek and Irondequoit Creek, it would seem more logical and less expensive to allow flood waters to overflow onto adjacent open land in the same manner as the annual flood overflow in Ellison Park. Land for the purpose could be purchased in the upper reaches of the watershed at much less cost than land required in the Panorama area for a flood project.

6 It is argued that waters are now almost fully absorbed in the available land areas upstream and that there would therefore be insufficient retention capability. I offer the counter-argument that waters could be diverted over a larger acreage than presently floods by very simple devices. It makes much more sense to curtail flow and velocity before it causes damage than to contain waters by massive, disruptive structures later. In so doing, it would be possible to retain vehicular usage of the Old Penfield Road bridge which is planned for pedestrian use only in the Corps plan. Closure of the bridge would be a hardship to residents and businesses in the area as well as a practical problem for the Town during the snow plowing season. Diminution of flow upstream would also allow proper access to the Genesee Conservation League which is allowed only a single lane road atop a levee under the Corps plan.

I would also point out that acquistion of overflow areas upstream could add a recreational component to a flood prevention plan. The resulting recreational advantages may well add to an acceptable benefit-cost ratio.

7 The April 29 meeting in Penfield produced no speaker who endorsed the proposed plan. In fact, many expressed concern. My considered opinion is that everyone recognizes the necessity of protection but have serious doubts about the selected plan as well as its financial impact.

8 It is possible that the Penfield Town Board and Monroe County might short-sightedly ~~might~~ request the State of New York to refuse being the local sponsor. Should that happen, and there is no alternative plan, the Corps will drop the project completely. The result will be $375,000 spent on the latest study, and, to make matters worse, no protection for the businesses and residents who have suffered considerable loss in past floods. Protection is needed. The Corps should find a more acceptable way to provide it.

My appeal is to request a more creative approach utilizing upstream retention. The Corps can and should dismiss conventional flood control methods and be willing to explore new directions in solving the Irondequoit Creek flood problem.

Very tuly yours,

Irene L. Gossin

I-25

The project was coordinated in considerable detail with both the U. S. Fish and Wildlife Service and the NYS Department of Environmental Conservation - Environmental Section.

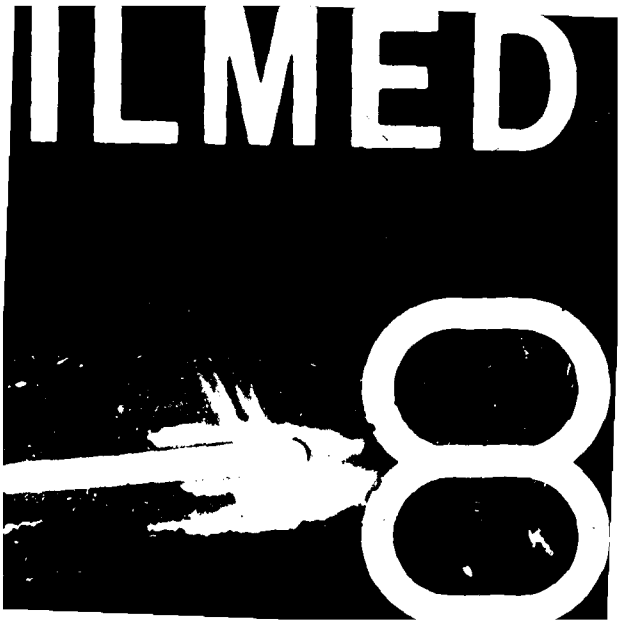
Any construction project of this nature would have at least temporary adverse impacts to water quality during the construction period due to sedimentation. Construction procedures are incorporated by regulation to minimize adverse impacts to the environment during construction (Corps of Engineers: Civil Works Construction Guide Specification - Environmental Protection). As stated in the Draft Environment Impact Statement - reference page EIS-31 - these impacts would be short-term while long-term water quality should return to without project conditions or improve.

5. The Corps of Engineers is aware of several proposals for developments in the vicinity. The "no future development" is qualified by "for the purpose of this analysis" and is in relative terminology based on the extent of existing development and flood plain regulation policies. Most proposed development in the flood plain is an expansion of existing buildings. Very little open space land is available for new construction.

6. Reservoir and diversion alternatives were considered in some detail during Stage II of the Corps planning process pursuant to the General Investigation study authority. Although some potential recreational and water quality benefits might be obtained from these alternatives, they were justifiably eliminated from further investigation under the General Investigation authority because it was determined that they could not contribute significantly to flood damage reduction in the watershed; the primary reason being the limited reservoir capacities. In addition, the cost of constructing one reservoir or several in series would not be economically justifiable. Eliminating vehicular traffic at the Old Penfield Bridge would cause some inconvenience, however, access to Penfield Road from Old Penfield Road can be reached within a 1/8 mile from the furthest resident. Draft reports provide for the bridge to remain with pedestrian access only. Further consideration however, will be given to the feasibility/possibility that vehicular traffic would be maintained under normal (non-flood) conditions but would be temporarily detoured during flood conditions. The details for this will be determined in development of detailed plans and specifications. On page A-19, items 3 and 4 of the Draft FFR, a 23-foot crest was allowed for reconstruction of a two-lane roadway on top of the levee. An alternate access route would be provided during construction.

7. A number of agencies/individuals favor the proposed plan. Refer to other review/comment letters. Generally, expressed concerns outnumber expressed approvals at these types of public meetings. While many of the speakers at the public meeting expressed concerns about certain design aspects, many of these people were still in favor of the selected plan provided some modifications are made in the final design.

8. This is probably true if details cannot be worked out. Based on findings of this General Investigation, the Corps of Engineers recommends the selected plan as the most feasible plan. Additional investigation would require more time and expenditures and would not result in any significant changes in the proposed plan.


FILMED
8