LEHIGH RIVER BASIN
POHOPOCO CREEK, PENNSYLVANIA

BELTZVILLE LAKE

DESIGN MEMORANDUM NO. 18

MASTER PLAN

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE - 2D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

AUGUST 1971

NAPEN-E(27 Aug 71) 6th Ind
SUBJECT: Design Memorandum No. 18, Master Plan,
Beltzville Lake, Pennsylvania

DA, Philadelphia District, Corps of Engineers, Custom House, 2d & Chestnut Streets, Philadelphia, Pennsylvania 19106 9 July 1975

TO: Division Engineer, North Atlantic 15 JUL 1975
ATTN: NADPL-R

1. Attached are six copies of revised pages and plates and the signed lease documents requested in the previous indorsement.

2. Regarding previous indorsement comments in paragraph 1c and 1d; apparently those pages were missing in some of the revised packages previously furnished. Additional copies of those pages are provided. Also, plate 5A has been added to show existing development.

FOR THE DISTRICT ENGINEER:

Worth D. Phillips

WORTH D. PHILLIPS
Chief, Engineering Division

1 Incl
3. DM 18 (Sext.)
Pages iv,3-3 and 3-4,3-7
and 3-8,9-1 and 10-1.
Plates 5A and 6.

NADPL-R (27 Aug 71) 5th Ind
SUBJECT: Design Memorandum No. 18, Master Plan, Beltzville Lake, Pennsylvania

DA, North Atlantic Division, Corps of Engineers, 90 Church Street, New York, N.Y. 10007 27 June 1975

TO: District Engineer, Philadelphia, Attn: NAPEN-E

1. Revised pages for the subject DM forwarded by the preceding indorsement are satisfactory subject to the following additional comments:

a. Revised page 3-8. Paragraph 3-08 Sewage Treatment, should be changed to 3-06.

b. Revised page 6-2, para. b(1), last sentence. It is requested that copies of the signed and dated 50-year lease be furnished for replacing the unsigned lease shown on pages D-2a - 2c.

c. Pages 9-1 and 10-2 should be revised to agree with the titles shown in the revised Table of Contents. In addition, the estimate figures on both of these pages are based on 1971 price levels and should be updated.

d. The revised Table of Contents indicates that Section X contains Conclusions and Recommendations, however, these paragraphs have not been furnished.

e. Plate 6 should be revised as requested in the OCE comment contained in the 2nd Ind. It is suggested that Plate 2 of DM 18A (Recreation Resource Management Appendix) be modified as necessary and substituted for the original Plate 6.

2. The revised pages forwarded by the preceding indorsement will be retained in this office pending resolution of these additional comments.

FOR THE DIVISION ENGINEER:

Incl
wd

for HERBERT HOWARD
Chief, Planning Division

NAPEN-E (27 Aug 71) 4th Ind
SUBJECT: DM 18, Master Plan, Beltzville Lake, Pennsylvania

DA, Philadelphia District, Corps of Engineers, Custom House, 2d & Chestnut Streets, Philadelphia, Pennsylvania 19106

TO: Division Engineer, North Atlantic
ATTN: NADPL-R

1. Inclosed for approval are six (6) copies of page revisions of the subject design memorandum which have been revised in accordance with ER 1120-2-400, 1130-2-400 and comments on preceeding indorsements.

2. Subsequent to the original submission in 1971, until the present time, vacillating State and Federal programs seemed to offer the opportunity for continued recreational development at the project. Recent clarification of requirements, the elimination of possible funding sources and the present unfavorable prognosis for early State cost-sharing participation, have prompted this revision without waiting for more dramatic developments in construction possibilities. This revision aligns the Master Plan and its appendices (DM 18A, Recreation-Resource Management) into compliance with the ER's and each other, while not changing the development pattern previously approved.

FOR THE DISTRICT ENGINEER:

Worth D. Phillips

WORTH D. PHILLIPS
Chief, Engineering Division

1 Incl (sext)
added 1 incl
2. Revised Portions DM 18

NADPL-R (27 Aug 71) 3d Ind
SUBJECT: DM 18, Master Plan, Beltzville Lake, Pennsylvania

DA, North Atlantic Division, Corps of Engineers, 90 Church Street,
New York, N.Y. 10007 27 March 1972

TO: District Engineer, Philadelphia ATTN: NAPEN-R

1. Reference is made to NADPL-R letter, 8 October 1971, subject: Master Plan Appendices.

2. Forwarded, noting approval and additional comments in 1st and 2nd indorsements, for your continuance of action.

3. In regard to the proposed recreation development in the Twinflower Area Plate 7A, the following is mentioned about the adequacy of radius of curve between highway T-435 and the new access road. Past construction has shown that the entrance into the operations and overlook area from T-437 is much too sharp. It is recommended that plans and specifications for Stage II reflect the minimum radius for entrancing and exiting to and from a main highway, and also be in accordance with State Highway Standards and ER's 1130-2-312 and 1110-2-400.

FOR THE DIVISION ENGINEER:

John F. Wrocklage

JOHN F. WROCKLAGE
Chief, Planning Division

DAEN-CWP-V (27 Aug 71) 2nd Ind
SUBJECT: DM 18, Master Plan, Beltzville Lake, Pennsylvania

DA, Office of the Chief of Engineers, Washington, D. C. 20314 16 Mar 72

TO: Division Engineer, North Atlantic

1. The Design Memorandum is approved, subject to the comments furnished by the Division Engineer in the 1st Ind. and to the following comments.

2. The information furnished in the Design Memorandum appears to be deficient in presenting the material requested in Appendix C, ER 1130-2-400. The text of the Design Memorandum should be expanded accordingly.

3. Paragraph 10-01 of the Design Memorandum lacks sufficient detail on which to make an adequate engineering review and for use in preparing plans and specifications for the pertinent recreational features.

4. A land-use allocation plan should be included, graphically depicting the allocations discussed in paragraphs 7-01 and 7-02, page 7-1.

5. Future development should be delineated on the individual recreation area plates. This should reflect future development by the State as well as the Corps.

6. Plate 8, Trinity Gorge Area. The plate indicates only 20 spaces for car parking while paragraph 3-05, (2) indicates initial construction for 100 cars. This discrepancy should be reconciled.

7. The quality of drafting and/or reproduction is inferior and unacceptable on some of the plates. This is particularly true of Plate 6. Since the Master Plan is a working document for the project, the quality should be improved and necessary plates reissued.

8. Management Appendices should be prepared in accordance with ER 1120-2-400 and ER 1130-2-400 at the earliest possible date.

FOR THE CHIEF OF ENGINEERS:

wd all incl

for IRWIN REISLER
Chief, Planning Division
Directorate of Civil Works

NADPL-R (27 Aug 71) 1st Ind
SUBJECT: Design Memorandum No. 18, Master Plan, Beltzville Lake, Pennsylvania

DA, North Atlantic Division, Corps of Engineers, 90 Church St., New York, N.Y. 10007 8 October 1971

TO: Office, Chief of Engineers, Attn: DAEN-CWP-V

In accordance with paragraph 9b of EM 1130-2-302, the subject Master Plan is submitted in triplicate. Approval is recommended subject to the following:

a. Reference is made to paragraph 5b, ER 1130-2-400, 28 May 1971, subject: Recreation Resource Management of Civil Works Water Resource Projects. It should be noted that the subject Master Plan was completed prior to receipt of the above referenced regulation and the required appendices were not prepared. The District is being requested to prepare brief appendices and these will be submitted at a later date.

b. A statement indicating the District operations element concurs in the Master Plan should be included.

c. Paragraph 2-04 f, page 2-3. If, as indicated here, sediment is deposited in the upper reaches of the reservoir at the major points of inflow, a plan for monitoring this deposition and control of eutrophication should be developed.

d. Paragraph 2-05 c, page 2-4. It is suggested that the sentence ending "250,000 recreation-days" be changed to "250,000", and the sentence ending "600,000 recreation-days" be revised to read "will accomodate a total annual visitation of about 600,000".

e. Paragraph 3-03 b, page 3-1. This paragraph should be rewritten to coincide with the visitation indicated in paragraph 2-05 c. It is also requested that reference to unsatisfied recreation-days be deleted.

f. Paragraph 3-05 b, page 3-5. Attendance figure used here should coincide with that used in 2-05 c.

g. Paragraph 3-05 c, page 3-6, and paragraph 6-01 c, page 6-1. Reference is made to EO 11593, May 13, 1971, subject: Protection and Enhancement of the Cultural Environment; NADPL-R letter, 19 May 1971, subject same as previous reference; ER 1120-2-402, 12 October 1970; and PL 89-665. It is suggested that the District take the initiative to schedule a meeting at the site with representatives of NPS, Pennsylvania

NADPL-R 8 October 1971

SUBJECT: Design Memorandum No. 18, Master Plan, Beltzville Lake, Pennsylvania

Historical and Museum Society and Carbon County Historical Society to determine the historical significance of the grist mill and mill race and avenues available for restoring and preserving the facilities and general area.

h. Paragraph 8-02, page 8-1. Reference is made to sub-paragraph a above. It is requested that other full and part time staff required for the operation and maintenance of the project such as Maintenance Supervisor, Laborers, Custodians, Clerks, Typists and Equipment Operators be shown and their salaries included in the estimated annual costs as part of Appendix A, Project Resource Management Plan.

FOR THE DIVISION ENGINEER:

Charles G. Stone

for JOHN F. WROCKLAGE
Chief, Planning Division

~~3 Incl~~
~~a/s~~

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-R

27 August 1971

SUBJECT: Design Memorandum No. 18, Master Plan, Beltzville Lake, Pennsylvania.

Division Engineer, North Atlantic
Attn: NADPL-R

Inclosed for approval are six copies of the subject design memorandum which has been prepared in accordance with the guidelines in EM 1130-2-302.

FOR THE DISTRICT ENGINEER:

W. D. STOCKMAN
Chief, Engineering Division

1 Incl sext
as

BUY U. S. SAVINGS BONDS REGULARLY ON THE PAYROLL SAVINGS PLAN

LEHIGH RIVER BASIN

POHOPOCO CREEK, PENNA

BELTZVILLE LAKE

DESIGN MEMORANDUM NO. 18

MASTER PLAN

OFFICE OF THE DISTRICT ENGINEER
U.S. ARMY ENGINEER DISTRICT, PHILADELPHIA
CORPS OF ENGINEERS
PHILADELPHIA, PA. 19106

PREFACE

This revised Master Plan, dated August 1971 (approved March 1972), was developed in accordance with guidelines in advance copies of Engineer Regulation (ER) 1120-2-400. That ER was published subsequent to finalization of the Master Plan and provoked a period of time for field assimilation and interpretive application to specific project needs. That data and plates in the August 1971 Master Plan provided the necessary information to become a working document even enough the format was not in the strictest compliance with the regulation.

Expanded developmental concepts were provided in the Recreation-Resources Management Appendices to the Master Plan (DM/8A, April 1974). Both of the design memoranda are intended to be coordinated and supplemental to each other as functional documents. Descrepencies of format and developmental concept in the two design memoranda need to be clarified.

The pages and plates, provided for this revised Master Plan, are designed to bring the design memorandum into closer format compliance with the regulation, provide additional information and to coordinate the Master Plan and the Recreation-Resource Management Supplement.

Rev June 75

LEHIGH RIVER BASIN
POHOPOCO CREEK, PENNSYLVANIA
BELTZVILLE LAKE

DESIGN MEMORANDUM NO. 18

MASTER PLAN

PREVIOUS AND SCHEDULED MEMORANDA

Design Memorandum No.	Title	Date Submitted or Scheduled	Date Approved
1	Hydrology and Hydraulics	3 Apr 64	9 Jul 64
2	Site Selection	7 Feb 64	8 Apr 64
3	General Design	15 Jul 64	4 Nov 64
4	Preliminary Master Plan	24 Jun 65	25 Mar 65
5	Real Estate	8 Jul 65	26 Jul 65
6	Site Geology	22 Jan 65	29 Mar 65
7	Concrete Aggregates	2 Feb 65	17 Feb 65
8	Highway Relocation	8 Oct 65	7 Jan 66
9	Utility Relocations	22 Jul 65	20 Dec 65
10	Outlet Works	29 Apr 66	Revised
10R	Outlet Works	12 Aug 66	14 Oct 66
11	Embankment and Foundations	25 Mar 66	17 May 66
12	Spillway	31 Mar 66	25 May 66
13	Access Road & Operation Facilities	31 May 66	2 Sep 66
14	Water Supply Regulation, Instrumentation and Sedimentation	15 Feb 67	18 May 67
15	Reservoir Clearing and Fish and Wildlife Facilities	31 Jan 68	17 Apr 68
16	Public Use Plan	14 Feb 69	19 Jun 69 *
17	Instrumentation	27 Apr 70	7 July 70 *
18	Master Plan	27 Aug 71	16 Mar 72 *
18A	Recreation-Resources Management Appendices to the Master Plan	3 May 74	10 July 74 *

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The content of the revised D.M. #18, Master Plan, Beltzville Lake was reviewed and is concurred in by this Division.

Thomas R. Coleman

THOMAS R. COLEMAN
Acting Chief, Real Estate Division

18 March 1974
Date

LEHIGH RIVER BASIN
POHOPOCO CREEK, PENNSYLVANIA
BELTZVILLE LAKE

DESIGN MEMORANDUM NO. 18

MASTER PLAN

SECTION 1
INTRODUCTION

1-01 AUTHORITY. The Beltzville project was authorized as a unit of the comprehensive plan for development of water resources of the Delaware River Basin, as set forth in House Document No. 522, 87th Congress, 2d Session. The comprehensive plan was adopted by the Flood Control Act of 1962, Public Law 87-874, 87th Congress, dated 23 October 1962 which states in part as follows:

"Section 203. The following works of improvement for the benefit of navigation and the control of destructive flood waters and other purposes are hereby adopted and authorized to be prosecuted. . .

DELAWARE RIVER BASIN

The project for the comprehensive development of the Delaware River Basin, New York, New Jersey, Pennsylvania, and Delaware is hereby authorized substantially in accordance with the recommendations of the Chief of Engineers in House Document No. 522, 87th Congress, 2d Session . . . . . "

1-02 PURPOSE AND SCOPE. The purpose of this memorandum is to provide guidelines for the administration and operation of the project, to preserve its scenic, biological and recreational resources and to assure coordination with interested Federal and non-Federal agencies in order that the future development of the area may be accomplished in an orderly and coordinated manner. The scope of this memorandum covers the initial development of water-related recreational and operational facilities and the future development of facilities as the demand requires.

1-03 PERTINENT DATA

a. Reservoir

Area at pool elevation 651 (spillway crest), acres	1,411
Area at pool elevation 628, acres	947
Volume of Flood-Control storage, acre-feet	27,030
Volume of water-supply storage, acre-feet	39,830
Volume of sediment reserve, acre-feet	1,390

b. Dam

Top elevation	672
Top width, feet	30
Crest length, feet	4,560
Slope on upstream side	
Above elevation 620	1 on 3
Below elevation 620	1 on 5
Slope on downstream side	
Above elevation 600	1 on 3
Below elevation 600	1 on 3.5

c. Spillway

Type of spillway	Uncontrolled
Length of control section, feet	100
Width of control section, feet	275
Elevation of crest	651
Side slopes of spillway excavation (rock-cut)	2 on 1
Side slopes of spillway excavation (earth-cut)	1 on 1.5

d. Flood-Control Outlet Works

Conduit dimensions	7'-0" Dia.
Length, feet	1,165.3
Discharge capacity, c.f.s.	
Maximum water-supply pool, elevation 628	1,680
Flood-control pool, elevation 651	1,840
Invert elevation at intake	503.39
Invert elevation at outlet	499.69
Service and emergency gates	
Type	Slide gate
Number	2
Size	2'-10" x 7'-4"
Stilling basin	
Width, feet	23.3
Length, feet	50.0
Apron elevation	486.5

e. Water Quality Control Outlet Works.

Discharge capacity at top of water-supply pool, c.f.s.	300
Number of intake ports	8
Vertical spacing, feet	11'-8"
Size of intake port gates	2'-0" x 4'-0"
Passage dimensions of divided intake wet-well	4'-6" x 10'-10"
Passage dimension of riser	4'-6" x 5' -0"
Size of control gate	2'-0" x 3' -0"

1-04 APPLICABLE PUBLIC LAWS. All pertinent paragraphs of the following public laws have been adhered to in the preparation of this Master Plan. *

PL 534-78 - Flood Control Act of 1944
Authority to create parks and recreation areas in Reservoir projects.

PL 624-85 - Fish and Wildlife Coordination Act of 1958
Stating that Fish and Wildlife considerations receive equal consideration with other project purposes and be coordinated with other features of water resource development programs.

PL 89-72 - Federal Water Projects Recreation Act of 1965
Established development of the recreational potential of Federal Resource projects as a full project purposes and allocates a cost-sharing responsibility on those projects to be run in part by the state where the Reservoir is located.

PL 89-80 - Water Resources Planning Act of 1965
An act setting up Federal, State and local coordination, and establishing commissions and boards related to water resource planning and controls.

SECTION II

DESCRIPTION OF THE PROJECT

2-01 PROJECT LOCATION. The site of the Beltzville Dam is located 5.2 miles above the mouth of Pohopoco Creek and 3.5 miles east of Weissport, Pennsylvania as shown on plate 1.

2-02 BASIN DESCRIPTION. The Pohopoco Creek, a tributary of the Lehigh River, is located in northeastern Pennsylvania about 73 miles northwest of the City of Philadelphia. The Lehigh River Basin is rural in character with only scattered communities upstream of the heavily populated Allentown-Bethlehem-Easton area. Upstream of the confluence of the Pohopoco Creek, the Lehigh River drainage area is 773 square miles. The Pohopoco Creek drainage area in 111 square miles and the portion above the damsite is 93.3 square miles. A detailed description of the hydrological characteristics of the basin is contained in Design Memorandum No. 1: "Hydrology and Hydraulics". The project area is shown on plate 2.

2-03 PRINCIPAL PROJECT STRUCTURES.

a. Embankment. The dam, an earth embankment type with an impervious core and random fill outer sections, has a crest length 4,200 feet with a maximum height of 170 feet above the stream bed. The top of the dam is at elevation 672 feet (sea level datum). The embankment has a top width of 30 feet. The top of the dam is surfaced with gravel to serve as a maintenance road. Access to an intake tower is by a service bridge.

b. Spillway. The spillway contains a concrete crest 275 feet wide and approximately 325 feet long approximately centered in an unlined channel cut into the right bank. The spillway discharge after leaving the unlined downstream section, will flow in a natural valley into Sawmill Run and Pohopoco Creek.

c. Outlet Works. The outlet works is located near the center of the dam and consists of a control tower and multi-level intake structure located on the upstream side of the dam. The tower leads gated water passages through the dam and a conventional stilling basin is provided at the downstream end to dissipate the energy of the conduit discharge.

d. Access Roads to Dam. Access to the top of the dam is directly from the operations building on the right bank via a bridge crossing the spillway channel.

e. Buildings.

(1) A previously existing barn, located near the toe of the right bank terminus, has been retained and utilized for additional materials and equipment storage.

(2) Two residences, located west of the project entrance, are for use by the dam tender and the assistant dam tender.

(3) A brick structure, housing the project offices, maintenance garages and a public overlook and visitors center, is located east of the project entrance. Both the project office and the visitors center contain water-borne sanitary facilities and potable water.

f. Recreation Facilities. Lands and facilities to be provided for recreational use are discussed in section III.

* 2-04 PHYSICAL FEATURES. Anticipating both potential resource management problems and the necessity to reduce operational and maintenance levels, the following features were planned into the development of the impoundment area. A more detailed discussion of the impacts of those features as they relate to resource management may be found in the Recreation-Resource Management Design Memorandum No. 18A.

a. Sedimentation. Design Memorandum No. 1: "Hydrology and Hydraulics", allocates 1,390 acre-feet of the reservoir for sediment storage. This amount of volume has been allocated for the purpose at the bottom of the reservoir. It is anticipated that the actual deposition of the sediment would be at the upper end of the reservoir or at points of major inflow. Investigation of possible shore erosion in the vicinity of water front facilities described in Design Memorandum No. 2, indicates that it seems highly improbable that any detrimental effect will be caused from sedimentation or erosion to the water front facilities. A program to periodically check sedimentation rates is a normal operational function.

b. Clearing. Reservoir clearing has been accomplished within the limits shown on plate 3 and as described as follows:

(1) Zone 1 - Bottom of reservoir to five feet below the 10-year drawdown (elevation 586). Vegetation larger than two inches in diameter, woody growth extending above elevation 586, downed timber and debris, existing buildings and structures and highway guard rails and fences have been removed. Pit toilets, septic tanks and sanitary connections were removed or sanitized and backfilled.

(2) Zone 2 - Elevation 586 to 631. All woody growth, downed timber and debris, and floatable buildings and structures have been removed, foundations have been demolished to grade and excavations filled and graded.

(3) Zone 3 - Elevation 631-651. All buildings, structures, fences, downed timber, debris, and floatable material have been removed. Masonry foundations have been demolished to grade and excavations filled and graded.

(4) Zone 4 - Elevation 651 to project limits: All buildings and structures except those required for use in connection with the project have been removed.

(5) Appearance Requirements. The area between elevation 631 and elevation 651 has been cleared of downed timber, debris, and unused structures to improve the appearance of the lands immediately surrounding the reservoir and to reduce potential hazards to the public.

* c. Deleted

2-05 PROJECT FUNCTIONS

a. Water Supply. The storage allocated to water supply, which is further subdivided into storage for municipal water supply (70%) and for low-flow augmentation (30%), is equal to 39,830 acre-feet. This volume, when combined with the volume allocated to sediment accumulation, would fill the reservoir to elevation 628. The total storage below elevation 628 is equivalent to about 8 inches of runoff.

b. Flood Control. A volume equal to 27,030 acre-feet has been allocated for flood-control storage. When added to the preceeding storage allocations, the combined volume is equal to 66,850 acre-feet and would fill the reservoir to elevation 651. The flood-control storage is equivalent to about 5 inches of runoff and the total controlled storage is equivalent to about 13 inches of runoff.

c. Recreation. Recreation will be provided at the project through the acquisition of land by the Corps of Engineers and development by both the Corps of Engineers and the Commonwealth of Pennsylvania. The development required for the first three years after the project is operational has been initially provided in the Pine Run area by the Corps of Engineers and was designed to accommodate an average annual visitation of 250,000 persons. Augmentation of the

initial development during the period from about three to five years after the project is operational will be provided as Stage II by the Corps of Engineers. This additional initial development will include overnight camping facilities at the Twinflower area. Future additional development by the Commonwealth of Pennsylvania will result in a total capacity for about 1,200,000 visitors. Both the Federal and the State developments will provide facilities for general day-and-overnight use. There will be fluctuations of the reservoir due to operation for water supply. A fluctuation of 13 feet estimated to occur once in two years, has been taken into account in the planning of the public use facilities. A drawdown of greater magnitude is considered to be detrimental to water-oriented recreational uses.

2-06 PROJECT AREA HISTORY 1/ In early 1735, a party of surveyors started from Wrightstown, Pennsylvania heading towards Blue Mountain. Its purpose was to map a large tract of land for purchase from the Indians. By the fall of 1737, the well-known "walking purchase" was completed, ending on Pocono Mountain near what is now the town of Jim Thorpe. The first patent warranted in what is now Carbon County was issued to Nathaniel Irish 1738. The first permanent settlement in the county was "Gnadenhuetten", settled by Moravians in 1746 near what today is Lehighton. To furnish protection to the settlement from marauding Delaware, Iriquois and Mohican Indians, Benjamin Franklin, the new Commissioner of Defense to the colonial government, in 1750's ordered construction of Fort Allen and Fort Hamilton. Fort Allen was located in what is now the town of Weissport, about three miles west of the Beltzville project and Fort Hamilton was located in what is now the village of Kresgeville, about eight miles northeast of the project.

a. With the influx of families in the late 18th century, the region first saw lumbering emerge as the local industry. The discovery of coal by Philip Ginder in 1791, and formation of the Lehigh Coal and Navigation Company by Josiah White in 1818, led to an area economic boom. The mining industry required vast quantities of timber for shoring and formation of the pig iron industry in 1850 was partly due to the assurance of a local source for these products. During the latter half of the 19th century other industries began to flourish. Paint ores were mined, roofing slate was quarried; roofing shingles were produced and wintergreen and birch oils distilled. The decline of the need for coal in the 1920's and the depletion of the forest resources coupled with modern technological advancements and better sources, has changed the economic stature of the county. Today there remains only one operatable mine in the county. A small abandoned slate quarry on project lands near Saw Mill Run *

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1/ Information from the Carbon County Historical Society.

was locally used for roofing materials. The once-forested lands are now devoted primarily to agricultural, grazing lands or recreation.

b. Adjacent to the project lands, downstream of the dam, is the site of Sultz's Grist Mill which was built in 1773. The mill machinery was operated by the water of Saw Mill Run, directed by a mill race to the water wheel at the mill. The Carbon County Historical Society has suggested to the Commonwealth of Pennsylvania that the mill be preserved for both its historical value and its representation as the last known structure of its kind in the area.

* 2-07 SUMMARY OF PROJECT BENEFITS. Monetary benefits were estimated for each project purpose based on projections of trends in population growth, employment, land development and recreation demand. Those estimates appeared in the General Design Memorandum No. 3 and Supplement No. 1, dated February 1966, and have been updated to reflect 1974 levels. Benefits and average annual costs were calculated on the basis of the 100-year lifetime of the project and the following additional criteria were considered for each of the project purposes.

a. Flood Control. Flood control benefits were based on an analysis of damage incurred during the flood of 1955. In addition to those benefits accrued through protection from damage, the estimate of flood control benefits includes increased usability of flood plains.

b. Water Supply, and Water Quality Control. The value of water supply benefits was assumed to be equivalent to the cost of the least expensive potential alternative project developed for the purpose of water supply only. Alternatives studied was a single purpose water supply reservoir at the Beltzville site and development of groundwater sources. The Beltzville water supply reservoir was found to be the least costly alternative.

c. Recreation. Benefits for recreation use of the Beltzville project were computed using the method set forth in Supplement No. 1 to Senate Document No. 97, 87th Congress, Second Session. Benefits were assigned an average value of $1.25 per visitor-day.

d. Fishing and Hunting. The U.S. Fish and Wildlife Service estimated the average annual benefits to fishermen over the 100-year lifetime of the project. No significant gain or loss in hunting benefits was expected to take place in the project area as a result of inundation.

Following is a summary of project costs and benefits.

Benefits	Value
Recreation, fish and Wildlife	$ 783,000
Water Supply and Quality Control	974,000
Flood Control	431,000
Total Value of Benefits	$2,188,000
Total Construction Cost	$22,200,000
Estimated Augmented Annual Cost	$1,037,000
Benefit/Cost Ratio	2.1

SECTION III

PUBLIC USE PLAN

3-01 PUBLIC USE RESOURCES CREATED BY THE PROJECT. The lake created by the dam has been the prime factor in the development of the recrea--tional resources of the area. It has created considerable opportunity to satisfy the increasing demand for water oriented recreation, picnicking and camping. The visiting public will require supplies, equipment and possible other public accommodations such as food and lodging. These requirements to satisfy the public needs should have a beneficial effect on the general economy of the area.

3-02 ACCESS ROADS. The location of the Beltzville Reservoir is unique in that it is less than two miles from the U.S. Route 209 interchange of the N.E. Extension of the Pennsylvania Turnpike. Plate 1 shows the major access roads available for easy, high-speed access to the area of the lake. The interstate highways are divided 4-lane limited access roads with 65 miles per hour speed limits. Other State highways such as Routes 611, 61, and 309 are 2-lane highways with 55 miles per hour speed limits. With these high speed roads and many other State roads as feeders, the most distant resident within a fifty mile radius of Beltzville could reach the area within approximately one and one-half hours.

3-03 PUBLIC USE POTENTIAL.

a. Region Served. Beltzville Lake serves a population which resides within a radius of fifty miles, or approximately one and one-half hours driving time as shown on plate 4. The most thickly populated portion lies south of the reservoir including the metropolitan areas of Allentown, Bethlehem, Easton, Reading, Pottstown and the suburban metropolitan area of Philadelphia lying in Montgomery, Bucks and Chester Counties. The next most populated region is in the Appalachian area with its southern extremity in the Pottstown area and its northern limits in the area of Scranton and Carbondale. The northeastern quadrant lies in the Pocono resort area. People in Philadelphia are mostly oriented to the New Jersey seashore resorts for recreation and vacation purposes and therefore are not included in the zone of influence of Beltzville Reservoir. Future expansion of the initial development will attract visitors from greater distance and expand the zone of influence. The estimate of annual visitors to the Beltzville public use area is based on principles presented in the report prepared by Robert R. Nathan Associates, Inc., Washington, D.C. The rationale is fully discussed in Design Memorandum No. 16-Public Use Plan.

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* b. Annual Visitation. Documents proceeding this Master Plan, and prior to a background of visitation history of facilities actually in use have provided a range of ultimate development annual visitation estimates from 500,000 in the project document to 782,500 in the Public Use Design Memorandum No. 16. Informal discussion with the Pennsylvania Bureau of State Parks indicated that, based on comparative experience in similarly situated State Parks, the ultimate annual visitation at Beltzville Lake would likely exceed 1,000,000 persons when all facilities were fully developed and existing facilities expanded to capacity. The early documents limited initial Federal recreation facility construction to that which would accomodate 250,000 annual visitors. During the writing of DM. No. 16 it became apparent that early visitation estimates, both initial and ultimate, were too low. Recognition of the newer thinking became evident in that DM however, funding limitations necessitated adherence to the 250,000 visitor initial construction goal. That limitation required the proviously the approved facilities considered for initial Federal construction be divided into two parts, one for immediate construction and the remainder for future construction. The presently existing facilities were structured to accomodate the 250,000 visitation rate by means of the following formula.

Design Load. To determine the design capacity, the design load formula ($DL = \frac{\text{Annual Attendance} \times 80\% \times 30\%}{14 \times 1.15}$) was applied, where;

Annual Attendance = 250,000

80% = Percent of annual visitors expected during the average recreation season.

30% = Percent of weekly visitors expected on a normal week-end Saturday or Sunday.

14 = Normal number of weeks per season.

1.15= Estimated turnover of day-use facilities on a peak load day.

This resulted in the need to provide 3,750 design spaces to accommodate the normal week-end day.

The initial recreational facilities, described in paragraph 3-04b below, have been available to the public since May 1972. Following is a tabulation of annual visitation rates from that time through the 1974 recreation season.1/

1/ From Annual Report, Recreation Resources Management System. The figure does not include an additional 42,807 visitors to the Corps overlook area.

1972 - 371,365
1973 - 402,829
1974 - 430,910 2/

The differences in facility design capacity based on 250,000 visitations and the actual visitations have been handled, without serious stress to facilities or the environment, by strong resource management practices of State Park Rangers. The need for relief of the overcrowded condition, particularly at Pine Run West boat launching facilities, is being partially met by designation of temporary parking areas and traffic direction according to use areas. There remains an unsatisfied boating demand at the park. Some of that demand can be met by (1) increasing the capacity of the existing boat-launching facilities or (2) by providing new boat-launching facilities.

The addition of the Twinflower camping area and Trinity Gorge Day Use Area (phase II initial Federal construction) would provide facilities to satisfy additional recreational demands and, in the case of Trinity Gorge, would tend to relieve some of the pressure on existing picnic areas. Camping facilities would provide a new Park use, with subsequently higher rates of total Park visitation and accompanying managerial problems, without substantially reducing use pressures at other facilities. Proposed boat-launching facilities provided at the camping area would not actually relieve the general boating demand, since general boaters are not necessarily also campers, and the facilities catering to campers would ursurp lake acerage available for general boating. While present trends seem to indicate that the total annual visitations to the project, when ultimate recreational facilities have been provided, will exceed the Public Use design memorandum estimate of 782,500 persons, the anticipated level of facility development in the immediate future does not require a re-analysis of future visitation rates by the method suggested in ER 1120-2-403. 1/ The immediate future development of part of the Trinity Gorge area, coupled with adjustment type expansion of existing facilities by the Commonwealth (such as parking lots, additional picnic sites and courtesy docks and improved managerial concepts), will meet the need of accomodating the difference between present visitations and the previously estimated level of 250,000. The distant future addition of camping facilities will introduce a new park use and be accompanied by the need for an adjusted estimate for public use which can benefit from a longer background of visitation history and insights into recreational demands and economic effects on the traveling public. A future revision of the Master Plan will include that adjusted visitation estimate.

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1/ The developing pressure for additional picnicking can alternately be met by providing informal picnic sites in the vicinity of remote, undeveloped areas of the park where visitors frequently seek solitude and lake access. These sites have been identified by State Park personnel and are usually associated with the existing road network. Additional sites can be provided at Pine Run East area, in the grove between the parking lots, since parking space is available and easily expandible.

3-04 DEVELOPMENT OF RECREATION SITES

* a. General. A brief discription of both existing and proposed recreation development follows. Future development is categorized as initial Phase II Federal construction and expansion of all facility categories by the Commonwealth of Pennsylvania. A plan for the combined ultimate recreation development is on Plate 5,6 and 7.

* b. Initial Recreation Site and Facilities - Stage I. The existing Pine Run area is a tract of 375 acres on both sides of Pine Run, a tributary to the impoundment. The terrain of the Pine Run area is level or gently sloped from an average of three percent along the northern edge of the area to six to ten percent along the edge of the recreation pool. There is a dense stand of about 180 acres of young second-growth hardwoods within the taking line, including an isolated stand of about 12 acres located near the edge of the recreation pool. All of these hardwoods have been left standing. Some reforestation of the open land will be required prior to expansion of facilities. The initial Federal development of this area consists of two sites for day-use recreation. Construction of the initial recreation facilities began in September 1970 and was completed in 1971. Development of the Pine Run area includes the following features described below. Refer to plate 5A

(1) Western Picnic Area. A minimum amount of clearing was performed for the one hundred and seventy-five picnic sites located within the existing wooded area. Trees have been thinned to permit reasonable placing of tables, grills and trash receptacles. Under growth of shrubs and bushy plants have been removed, and the ground surface generally left free and clean for easy access and maintenance. Every 4 tables has been provided with one grill and one trash receptacle. A comfort station with water borne sanitary facilities has been provided to serve the area. Parking for 166 cars is available parallel to the north edge of the woods.

(2) Central Picnic Area. Over 800 trees salvaged from the Pine Run area provide a wooded area and parking lot screening for the picnic facilities located adjacent to the changehouse. When the trees have reached affective size the picnic area will be furnished with approximately 40 tables. Every four tables will be provided with one grill and one trash can receptacle.

(3) Changehouse and life guard station. The changehouse is a contemporary style brick-faced structure with a modified hip-roof featuring exposed timber construction. The main part of the building is divided into two equally sized bathrooms seperated by a centralized mechanical room. The men's bathroom contains 10 wash basins, 10 urinals, 10 toilets and six showers. The women's side will contain lo wash basins, 20 toilets and six shower stalls. Each side of the changehouse contains an unroofed change stockade. The women's side contains 42 individual stalls while the men's side contains benches. Tempered water

is available for showers and the building is lighted. The lifeguard station has been constructed to match the exterior brick face of the change house and is divided into five rooms to be used for office, training, bathroom, storage and first-aid purposes. The showers and water borne toilet facilities are connected to the sewage disposal system. The area is served by two parking lots with a combined capacity of 516 cars.

(4) Covered bridge feature. An 80 foot long covered bridge has been salvaged from the lake area and is relocated over a swale adjacent to the central picnic area.

(5) Boat launching area. The boat launching facilities are located on the east bank of Pine Run, opposite the swimming and picnicking facilities. The boating site includes facilities to accommodate 30 cars, 76 cars and trailer, a triple lane launching ramp, a courtesy dock and a vault latrine which will be converted to waterborne sanitation when upstream development of camping areas require an extension of the sewage system. *

(6) Downstream fishing facilities. Off-road parking is available on the terminated end of subsequently relocated Township Road 397. A vault latrine has been provided for fisherman use.

(7) An overlook structure is attached to the Corps of Engineers operations building and includes appropriate audio-visual displays, waterborne sanitation and parking for 25 cars. *

(8) Landscape planting has been completed by contract, acquisition of labor and materials for existing project structures including the overlook, operational facilities, residences and relocated road. Landscape planting has been accomplished at the initial public-use facilities by contract acquired labor using plant materials salvaged from the project area. Based on the experience gained from the Pine Run recreation area planting contract, and the continuing availability of salvagable plant material at the project, future plantings will be accomplished utilizing salvaged plant material.

3-05 FUTURE DEVELOPMENT

a. Federal Government. The limitation of funds available for the design and construction of the Government development of the Beltzville public use facilities made it necessry to program the construction in two initial stages. The first initial stage is the Pine Run area previously described and the second initial stage as described herein. It is anticipated that construction of the second initial stage facilities will be accomplished with code 710 funds. *

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(1) Twinflower Public Use Area. The Twinflower area will be developed as a camping facility. The initial development by the Federal Government, shown on plate 6 on the east side of Wild Creek, will include access road and camping loops with trailer spurs to accommodate approximately 200 campsites. Each site to be so constructed and furnished that it may be used either for trailer or tent camping. The initial construction when completed will include an access road, an entrance station with a nearby trailer sanitary dumping facility, three loop roads with 75 trailer spaces and two wash houses for each loop, a boat beaching area with a 25 car parking area. Each of the wash houses will be provided with toilet facilities and showers for men and women. A laundry area and tempered water will also be provided in each building. The 36 inch water main from Wild Creek Reservoir to the City of Bethlehem which passes through the area will be tapped for potable water distributed through a system to each camp area. A water-borne sanitary system will be provided. Connecting to the existing system at Pine Run west, effluent will move through a 6" force main, with three pumping stations, intercepting the Pine Run east comfort station. The existing sewage treatment plant near the toe of the dam will be enlarged to handle the new loadings.

(2) Trinity Gorge. The initial development of Trinity Gorge Public Use area, shown in plate 8, will provide day-use facilities only. These will include a picnic area within an existing grove of trees, adjacent parking area for 20 cars, potable water supply from a well, and a vault latrine. The existing access road will be widened and repaved, a new entrance from L.R. 13012 and a new culvert over a tributary creek will also be constructed. Much of the area, up and downstream of the picnic site could be used by visitors for nature study. Single phase power is available for operation of well pumps and other items as may be required. The estimated cost of the initial development is $122,000. No planting is required at Trinity Gorge recreation area since the picnic area is placed in an existing orchard and parking areas and access road placement take advantage of other existing vegetation.

b. Commonwealth of Pennsylvania. The Commonwealth of Pennsylvania also proposes an ultimate future expansion beyond the initial development stages, without specifying a time limit, to accommodate approximately 1,200,000 annual visitors. The initial development by the Government will permit the future expansion and addition of facilities by the Commonwealth as follows:

(1) Pine Run Cove Area, West.

(a) Enlargement of the swimming beach area to accomodate 2,600 bathers. This will require an enlarged parking area, comfort and change house facilities.

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(b) Expansion of the existing picnic area and parking lots to accommodate 500 cars and their occupants. An additional picnic area will be provided north of the beach parking area to accommodate 110 cars and occupants.

(c) In addition to expanding the initial facilities a play area, open turf area, boat beaches and a concession area will be constructed. *

(2) Pine Run Cove Area, East. The boat launching facilities will be expanded from 3 to 5 ramps. To accomodate the cars and trailers, it is proposed to expand the parking facility to 225 cars with trailers. An additional courtesy dock is also proposed. * plus 60 car slots

(b) Deleted.

(3) Trinity Gorge. The entire Trinity Gorge day-use area except for initial picnic facilities, is being left for future development by the Commonwealth of Pennsylvania. The future plans for the area include.

(a) Rehabilitation of the existing road from U.S. Route 209 to the initially constructed access road. *

(b) Swimming facilities for a maximum of 1,600 people with change house, comfort facilities and life guard station.

(c) An expanded picnic area and water and sanitary facilities for 1,640 people.

(d) Nature study areas and hiking trails.

(4) The Twinflower area. The future development by the Commonwealth of Pennsylvania, is ultimately planned to contain:

(a) Additional trailer and/or tent camping with 1,070 spaces and necessary wash houses.

(b) Group Camping area.

(c) Amphitheatre.

(d) Swimming and picnicking facilities *

(e) Boat launching and beach facilities. *

(f) Concession area with parking for 250 cars.

(g) Augmented water supply system and a sewage disposal system.

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c. Carbon County. The Carbon County Historical Society has informally discussed plans to preserve, as an historic site, the grist mill and mill race which is located near the confluence of Saw-mill Run and Pohopoco Creek downstream from the dam. The grist mill is outside the project boundary but, the mill race and sluice are within project land. The general area of Saw Mill Run is a small but scenic area including the Slate Quarry Site discussed in paragraph 204h. There are no present plans to develop the Saw Mill Run area for more than its present use as an ecological study area due to higher developmental priorities of the Bureau of State Parks which operates the area.

The grist mill is still in private ownership and functions only as a dwelling. The desire of County Officials to develop the mill and quarry areas has met with difficulty stemming from both the private ownership of the mill, the lack of funds at the County level and the capability of participating agencies to meet historical registering requirements. At the present time the present mill owners show no interest in the project, the County would have to acquire the property and initiate registering procedure, the Commonwealth presently has higher priorities and committments and the Corps is without authority to become involved until it can act as a participant in development on Federal lands. The Commonwealth has informally investigated the structures and has noted that their general declining condition may be too costly to refurbish in view of their questionable acceptance on the State Register of Historic Places.

3-06 SEWAGE TREATMENT. The existing sewage treatment plant, located at the toe of the dam on the north bank, has been sized to handle effluent from the initial phase facilities of the Twinflower Recreation Area. Sewer lines and pumping stations will be provided from the Twinflower facilities to connections into the system at the existing Pine Rum complex. When the connection is made the comfort station at Pine Run East (boat-launch site) will be placed on-line. The existing treatment plant can readily be expanded to accomodate future sewage requirements resulting from ultimate construction of all Twinflower facilities.

An alternate method of handling sewage effluent, in the initial construction phase of Twinflower, was considered and abandoned. That alternate envirsioned a package sewage treatment plant at the Twinflower site with the treated effluent being disposed of by spray irrigation into adjacent forests. The method was considered inappropriate since the required forest acerage for spray irrigation on a rotational basis was not available and the limited available forest is located too close to proposed and future camping facilities. Furthermore, it was considered likely that ground water could become contaminated by the process and threaten water quality in the lake.

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SECTION IV *

RESOURCE INVENTORY

4-01 INTRODUCTION. This discussion is a brief resume of a more detailed inventory found in the Recreation-Resource Management Design Memorandum No. 18A. That design memorandum elaborates on the topics listed below and relates their importance to the managerial aspects of project operations.

4-02 GEOLOGICAL HISTORY. The area is located in the middle portion of the Appalachian Valley and Ridge physiographic province. Pohopoco Creek flows parallel to the northeast-southwest trending ridges and is incised in gently sloping Devonian shales, siltstones, and sandstones. The project area contains outcroppings of what is thought to be the Centerfield coral reef. This formation, which is rich in fossils, dates back to the Devonian period. There is also evidence that changes in the structure of the earth's crust created lagoons during the Mississippian period. Some of the marine life that inhabited these lagoons has been identified in fossils found in the project area. Discussion concerning identification of deposit areas and future development is found in paragraph 6-02e.

4-03 TOPOGRAPHY. The difference in elevation between the valleys and ridges in the project area is about 400 feet. A number of deep narrow gorges, most of which are located on the gently sloping north side of the reservoir site, are aligned generally perpendicular to the creek. A high, steep ridge forms the south side of the valley. The ridge is particularly steep near the dam site and upstream portion of the reservoir site. It recedes slightly to the south near the mid-point of the reservoir, leaving a pocket of relatively flat land on the south side of the project area.

4-04 SOIL CONDITION. Glacial frost action south of the Wisconsin terminal moraine produced a channery condition of the soil surface layer. Channery soils are predominant in the project area. They contain thin flat fragments of sandstone, limestone, or shale as much as six inches in length along the longer axis. These fragments are thickly interspersed throughout a silt loam.

4-05 VEGETATION. Nearly all relatively flat lands have been cleared and farmed for many years. Uncleared land contains an abundance of second growth hardwoods including species such as red maple, various oaks, ash, hickory, birch, dogwood, sassafras and hawthorn. The slopes of both gorges and ridges are forested with dense stands of hemlock and rhododendron and a scattering of other conifers and hardwood species. Three significant coniferous man-made nurseries exist.

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a. Located near the storage barns, this nursery contains approximately 700 spruce and fir.

b. Located approximately one-quarter mile east of the project office, this nursery contains nearly 1000 pine.

c. Located at the northwest end of Sawmill Run, the nursery contains about 1000 fir and scattered spruce.

4-06 METEOROLOGY. The Lehigh River Basin, including the area drained by Pohopoco Creek, enjoys a temperate northeast Atlantic coast climate that is characterized by frequent changes in temperature and occasional moderate amounts of precipitation. The following paragraphs explain the climatological features of the basin.

a. Temperatures. The mean annual temperature in the Lehigh Basin is about 50°F. The range of mean monthly temperature varies from 73.0°F. in July to about 24.6°F. in January. The average frost-free period is 150 days per year.

b. Precipitation. The mean monthly precipitation varies from a minimum of 2.16 inches in January to a maximum of 5.15 inches in June, as recorded by the U.S. Weather Service at both Palmerton and Beltzville over the past five years.

c. Snowfall. The average yearly snowfall, as recorded at Palmerton and Beltzville for the past years is 28.64 inches. The largest yearly snowfall in the last five years was in 1969 when 42.4 inches fell.

d. Wind Data. There is little information concerning winds in the location of the project area. Date is available from locations approximately 20 to 100 miles distant from the project. While winds are generally from the northwest they are directed from their natural course by th linear alignment of the lake and the height of Kittatinny Mountain paralleling the south bank. By observation, winds during average clear weather during the recreation season are moderate (10 mph or less) and move directly up the impoundment from the east. There is an area protected from the wind at the upstream face of the dam.

4-07 FISH AND WILDLIFE

a. Fishery. Pohopoco Creek is considered one of the best trout streams in the State. The Pennsylvania Fish Commission has stocked the lake with fry and fingerlings among them the Tiger Muskellunge, a notable sport fish.

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Fry stocked at the lake are Walleye, Chain Pickerel, Tiger Muskellunge, Largemouth Bass and Smallmouth Bass. Fingerlings stocked in the lake are Yellow Perch, Channel Catfish, Black Crappies, Brown Trout, Kokanee Salmon, Rainbow Trout and Tiger Muskellunge.

b. Wildlife. Over 440 acres of the project area have been leased to the Pennsylvania Game Commission by the Corps. The whole park is open to the public for hunting with the exception of Pine Run and the immediate vicinity around the Corps' service building and dam tender's house. Over 37 species of wildlife have been identified in the project area. Some major species hunted here are whitetail Deer, Wild Turkey, Pheasant Quail, Grouse, Rabbit and Fox.

4-08 WATER QUALITY.

Beltzville Lake is classified Fl by the Pennsylvania Bureau of Water Quality Analysis. That classification is a limitation of no more than a geometric mean of fecal coliform recorded in five consecutive weekly testings. To date this standard has been met and water quality at Beltzville Lake remains high. Water quality is continually monitored by a sophisticated remote sensing console offering readings of pH, temperature and various salt contents.

4-09 AESTHETIC AND SCENIC VALUES

a. Saw Mill Run Slate Quarry. The abandoned quarry is located in a wooded area below the spillway and is adjacent to the creek from which it derives its name. The quarry contains a pool 50 feet in diameter about 25 feet below grade. The rear and sides of the pool are walled by sheer rock faces rising nearly 75 feet high. The area along Saw Mill Creek, leading to the quarry, remains accessible by a narrow road but is closed to the public for safety reasons. A number of summer homes along the road, subsequently removed from the project lands, had been landscaped to provide the entire area with a rustic charm.

b. Pine Run Arm. Located at the mouth of Pine Run is a small falls marking the creek entrance into the impoundment. Beyond the falls in the tributary gorge is a notable stand of native rhododendron and conifers.

c. Wildcreek Arm. Notable stands of native azalea, spring flower bulbs and associated ferns are located on the west bank of the Wildcreek arm. At the head of the arm, also on the west bank, is a rock face in the cracks of which numerous ferns and moss are growing. The overburden above the rock contains an undergrowth of native azalea and other shrubs lending considerable charm to the area in springtime.

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d. South Bank. From a location opposite the Wildcreek arm eastward into the far upstream reaches are steep, rocky banks prolifie with native rhodendron. The upstream reaches are worthy in themselves for quiet, unspoiled solitude.

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SECTION V

DEPARTURE FROM PREVIOUS DOCUMENTS

5-01 PROJECT DOCUMENT. The project document proposes that four public use areas be constructed. Area 1, would be on the north shore of the reservoir and on both sides of Pine Run. The west side, between Pine Run and the dam would be developed as a day use area with swimming, picnicking, hiking, boating, boat launching and fishing. on the east bank of Pine Run, boat launching would be provided. The second area, somewhat further east of Pine Run, would be developed as a small overnight camping area. A third site on the upper reaches of the reservoir would be developed as another day use area. The fourth site, on the south side of the reservoir, at Trinity Gorge, would be developed as a day use area for boat launching, swimming, picnicking and hiking. The project document development is based on an initial development for 110,000 annual visitors for all sites whereas this plan provides for an annual visitation of 250,000 persons. The project document does not provide for a sanitary sewerage system or treatment plant for disposal of human wastes nor for a water supply system and a treatment plant.

5-02 GENERAL DESIGN MEMORANDUM. The General Design Memorandum provided for three major Public Use areas; one on both sides of Pine Run for day use, a second one at the upper reaches of the reservoir for overnight camping and a third on the south shore at Trinity Gorge for an initial annual attendance of 300,000.

5-03 LAND REQUIREMENTS PLANS - PUBLIC USE

a. This plan proposed that the Commonwealth of Pennsylvania would acquire approximately 289 acres of land north of the presently relocated Township roads T-397 and T-437 for the development of a Natural History Interpretation Area. This plan was not followed because DM No. 8, Highway Relocations, recommended constructing the lower route for the relocation of T-397 and T-437. This would have required the Commonwealth to acquire their additional land on the opposite side of the road. The Pennsylvania Department of Environmental Resources objected to a through traffic artery bisecting the recreation area. As a result, all the land up to the relocated road has been acquired in fee by the Federal Government. Additionally, the Federal Government has acquired in fee a strip of land 300 feet wide on the opposite side of the township road, as a buffer strip for the protection of the park area.

b. The Primitive Group Camping, east of Pine Run Cove, is not included in proposed future development by the Commonwealth. This type of camping is not considered desirable in this area

by state authorities because of the problems involved in the disposal of sanitary waste. After afforestation by the Commonwealth, this area could be used for hiking trails and nature study, if considered advisable by the State authorities.

c. Previous subparagraph deleted.

*

c. The Land Requirements Plan - Public Use Design Memorandum allocated $14,000 for "afforestation" of 400 acres but did not include plantings for the enhancement of the proposed recreational areas. Reforestation by seedlings is included in the current plan but planting of larger trees and shrubs is also considered necessary for adequate development of the recreational areas.

* 5-04 PUBLIC USE PLAN.

a. Design Memorandum No. 16. The scope of recreation facilities development, details of facility location and architecture, planting arrangements and the treatment of facilities supporting the recreation development, have been revised from those shown in the approved Design Memorandum No. 16, Public Use Plan, dated February 1969. Appendix E and indorsements 1 through 7 of the transmittal letter in that Design Memorandum discuss the changes and reasons for them. Subsequent existing construction reflects those revisions.

b. The Public Use Plan indicates development of Trinity Gorge and Twinflower recreation areas will be accomplished by the Commonwealth of Pennsylvania. Appendix E of that Plan discusses the reasons preliminary to revising the future Federal development as outlined in paragraph 3-05 herein. The Commonwealth was informed of these events by letter (see appendix A-4) and at a meeting on 10 January 1969, subsequent to that staff meeting cited in appendix E-3 of the Public Use Plan, the Commonwealth determined it would be unable to honor the requirements of the assurances previously supplied if it was necessary to also assume the large development burden of the Twinflower and Trinity Gorge recreation areas. A letter relative to the Commonwealth position is in appendix A-5. The previously furnished assurances are mutually satisisfactory in light of the revision of the future development program outlined herein. Refer to paragraph 6-02. Recent informal
* queries regarding the status of the Commonwealth attitude involving development responsibilities indicates there is no change from the previous arrangements.

c. Trends developing in annual visitation rates seem to indicate a much greater Public-use than previously estimated however, insufficiant
* time has passed since the first use of the facilities to provide a firm basis for a new estimate. Continued recreational development, for the short term, is more contingent on meeting present demands than in introducing new uses. A reorganization of developmental priorities as outlined herein, coupled with managerial coordination of existing facilities, as reflected in the Recreation-Resource Management Design Memorandum No. 18A, represent the basic change from the Public Use Plan.

g. The Public Use Plan indicates development of Trinity Gorge and Twinflower recreation areas will be accomplished by the Commonwealth of Pennsylvania. Appendix E of that Plan discusses the reasons preliminary to revising the future Federal development as outlined in paragraph 3-05 herein. The Commonwealth was informed of these events by letter (see appendix A-4) and at a meeting on 10 January 1969, subsequent to that staff meeting cited in appendix E-3 of the Public Use Plan, the Commonwealth determined it would be unable to honor the requirements of the assurances previously supplied if it was necessary to also assume the large development burden of the Twinflower and Trinity Gorge recreation areas. A letter relative to the Commonwealth position is in appendix A-5. The previously furnished assurances are mutually satisfactory in light of the revision of the future development program outlined herein. Refer to paragraph 6-02.

SECTION VI - COORDINATION

WITH OTHER AGENCIES

6-01 PRE-OPERATIONAL COORDINATION. *

a. Federal Agencies.

(1) U. S. Fish and Wildlife Service. The U. S. Fish and Wildlife Service, in a report on the wildlife resources at the project, dated 14 May 1964, has stated that the acquisition of lands for joint-use and public-use purposes will not change the degree of hunting opportunity now present on those lands. The Service has recommended that 300 acres of project land be set aside for wildlife management under the Pennsylvania Game Commission to mitigate the loss of wildlife habitat. In a report on fishery resources, in a letter dated 12 June 1964 and included in appendix C of Design Memorandum No., 3 the Service has indicated substantial net increase in fishery benefits due to the project, conditioned on adequate public access to the shores and the provisions of boat launching ramps. The Service, in cooperation with the Fish and Game Commission, has voiced no objection to any aspect of the project. An expanded discussion concerning U.S. Fish and Wildlife Service views is included in the Public Use Plan, DM No. 16. The plan to provide the recommended lands for wildlife management is discussed in paragraph 6-02a (1).

(2) U. S. Public Health Service. The Public Health Service has indicated that vector mosquito problems may be avoided by clearing trees and brush to the top of the normal pool; by locating borrow pits where they would be permanently inundated; by altering depressions on the periphery of the normal pool to permit complete drainage in the event of pool drawdown. In addition, they indicated that a field study should be made following impoundment to determine if additional mosquito control measures would be necessary. The Beltzville project, in light of the Service's views, will not have a deleterious effect on the health environment of the project area. See Design Memorandum No. 15, Reservoir Clearing and Fish and Wildlife Facilities.

(3) National Park Service. The archeological aspects of the project have beeen studied by Temple University (Philadelphia) under a contract with the National Park Service. Preliminary findings show no evidence of historic or prehistoric settlement of National significance. The Service has sponsored a geological study by the University of Pennsylvania. A copy of the report resulting from that study is in appendix B-1.

Rev. June 75

b. Non-Federal Agencies.

(1) Pennsylvania Department of Environmental Resources. The Pennsylvania Department of Environmental Resources is the agency responsible fot state park development in Pennsylvania. At Beltzville, the Department is the coordinator for both the Fish Commission and the Game Commission of Pennsylvania. The Beltzville project has been adopted by the Department as a regional park under Project 70, a referendum approved bond issue for the acquisition of land for conservation and recreation purposes. On the basis of the reorganized construction schedule, outlined in the Public Use design memorandum the responsibility for public use lands and facilities at the Beltzville project as previously stated in the 1965 resolution. Refer to appendix A, page A-3, A 50-year lease for the operation and maintenance of those facilities by the Department isincluded in appendix D, page D-2.

(a) Pennsylvania Game Commission. Coordination among the Pennsylvania Game Commission, Department of Environmental Resources the Philadelphia District, Corps of Engineers and the U.S. Fish and wildlife Service has resulted in selection of tracts of Land totalling about 422 acres for inclusion in the "General Plan for Use of Project Lands and Waters for Wildlife Conservation and Management Beltzville Reservoir, Pennsylvania." Lands designated under that plan included in Recreation- Relocation Appendix B-2 are presently under license to the Pennsylvania Game Commission. A copy of the license is included in appendix D-1. Additional tracts of land (totalling about 112 acres) continuous to those discussed above are slated for ultimate leasing to the Department of Environmental Resources for recreational purposes; however, until that Department indicates need, they have been included in the area licensed to the Game Commission.

(b) Pennsylvania Fish Commission. The Commission has stocked Beltzville Lake to provide a warmwater fishery. Previous requirements for fish shelters have been withdrawn because the depth at drawdown contemplated would be more than the depth of the shelters. Correspondence relative to stocking by the Commission is in appendix A-10.

(c) Carbon County Historical Society. The Carbon County Historical Society, which provided the information in paragraph 2-06, is actively interested in the project development particulary as it relates generally to an added county attraction and specifically to the locally historic site of the mill at Saw Mill Run and preservation of the covered bridge. The Executive Director of the Society holds the same post in the Carbon County Planning Commission.

(d) University of Pennsylvania. Members of the geology department at the University of Pennsylvania, working under a National

Park Service contract, provided a representative fossil collection from the project for display in the overlook building. The department was also instrumental in determining a site subsequently developed for fossil hunters to replace the inundated outcropping. A copy of the final report, submitted by the University to the National Park Service is included in appendix B-1. Related corresponsence is included in appendix A-1 and A-2. It has been noted that supervised study groups frequent the existing fossil beds. Representatives from Drexel University, Philadelphia Museum of Natural History, Temple University and many local schools and scout groups have visited the area.

6-02 POST-OPERATIONAL COORDINATION. Coordination with the Pennsylvania Department of Environmental Resources and the Pennsylvania Fish and Game Commissions is reflected in Commonwealth responsibility for operations and maintenance of recreational facilities at Beltzville Lake. Day-to-day coordination between Pennsylvania Bureau of State Park and Corps personnel is continuing and essential. Coordination with State agencies related to revision of this Master Plan and evolvment of the Recreation-Resource Management appendices (DM No. 18A) is documented in the latter design memorandum. That design memorandum shows the basic managerial concepts of the State agencies developed from annual submittal of plans to the Corps and by inter-agency meetings to develop both DM No. 18 and DM 18A.

SECTION VII

LAND ALLOCATION

7-01. LAND USE CLASSIFICATION. All project lands fall into operational, fish and wildlife areas or public access for recreation classifications.

7-02. LAND USAGE. The project lands consist of 3693 acres of which 3615 acres have been acquired in fee simple and 78 acres in easement by the Federal Government. On the lands acquired in fee simple, 947 acres are occupied by the impoundment, 825 acres were required for the dam and operations building and 310 acres have been allocated to mitigate damage to wildlife habitat. The remaining 1611 acres will be utilized for recreational purposes. Specific allocations for * uses of project lands are seen on the plates and in the texts of this Master Plan and in the Recreation-Resources Management DM No. 18A. Details of those allocations are defined in real estate agreements with the Commonwealth agencies, including the Bureau of State Parks, Game Commission and Fish Commission. Generally, lands under wildlife management are seen on plate 5, presently existing recreational facilities and adjacent lands are managed by the Bureau. Lands not presently under Bureau supervision, but which will be utilized for recreational development in the future, are under temporary Game Commission control. The Fish Commission is responsible for lake management. Corps management is generally limited to the lands immediately adjacent to the dam, dam structures, residences and operational buildings and the overlook. The lake and recreation areas are utilized for active recreation and supportive facilities are provided. Lands managed by the Game Commission are available for hunting in season and passive recreation. Corps managed lands are available for passive recreation and operation of project structures.

SECTION VIII
PROJECT MANAGEMENT

8-01 ADMINISTRATION. The District Engineer, Philadelphia, will have the responsibility of administering the Master Plan and updating it as required. In addition he will be responsible for administering of leases, licenses and permits. He will also be concerned with determining the nature and extent of development, record activities relative to policies and regulation and coordination with other agencies and public relations.

8-02 OPERATION AND MAINTENANCE *

a. Corps of Engineers.

(1) The following permanent staff is required for project operation and maintenance involving reservoir regulation, flood control and water supply.

1 Head Dam Operator W-11	$ 12,000 p.a.
1 Dam Tender, W-08	11,000 p.a.
Part Time Helpers	4,600
TOTAL (includes leave and estimated overtime)	27,600

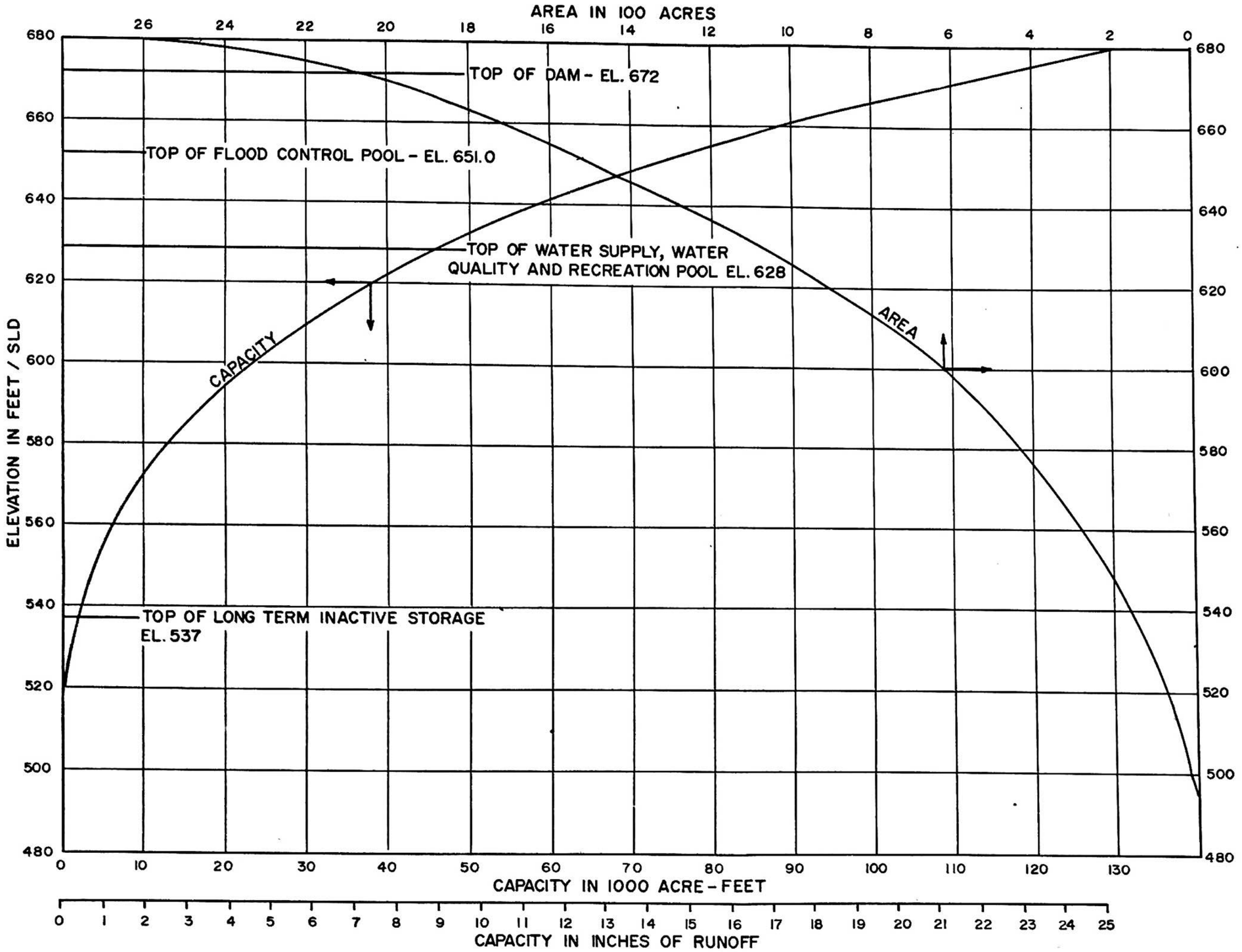
(2) Estimated annual costs of operation, maintenance and replacement:

Buildings, grounds, and equipment	23,800
Utilities	1,900
Supplies and materials	5,500
Vehicle costs	3,100
District overhead (Engineering, S & I, Radio Net)	24,000
Recreation (Visitors Center; Recreation Surveys)	1,400
Stream Gaging	2,000
SUBTOTAL	61,700
Salaries	27,600
GRAND TOTAL	$ 89,300

b. Commonwealth of Pennsylvania. The Commonwealth of Pennsylvania has assumed the responsibility for operation and maintenance of the recreation facilities provided by the Corps. It is estimated that the annual operation budgetary requirement for this area in CY 1975 will be $115,000. A letter from the Commonwealth detailing the expenditures is in appendix A-11.

8-03 RESERVOIR OPERATION. Impoundment and release of water in Beltzville Lake is the responsibility of the Corps of Engineers in compliance with achieving the project purpose. The authority and methodology for that responsibility is defined in the Reservoir Regulation Manual. The mechanics of controlling the lake waters takes precedence over the recreational uses of the project however, in day-to-day operations, on informal coordinated effort between park and lake managers is essential. That effort continues at Beltzville Lake and results in both a better understanding of managerial parameters between agencies and in reducing frictions

created by unilateral actions. Examples of that coordination include early warning to Commonwealth personnel,and others of pool fluctuations which might effect fish spawning or stocking, recreational facilities access or downstream users. An expanded discussion of the managerial impacts of reservoir operation is provided in appendix A of the Recreation-Resource Management Design Memorandum No. 18 A. Some of the physical parameters of the reservoir operation plan depicted on the following graphs and chart.



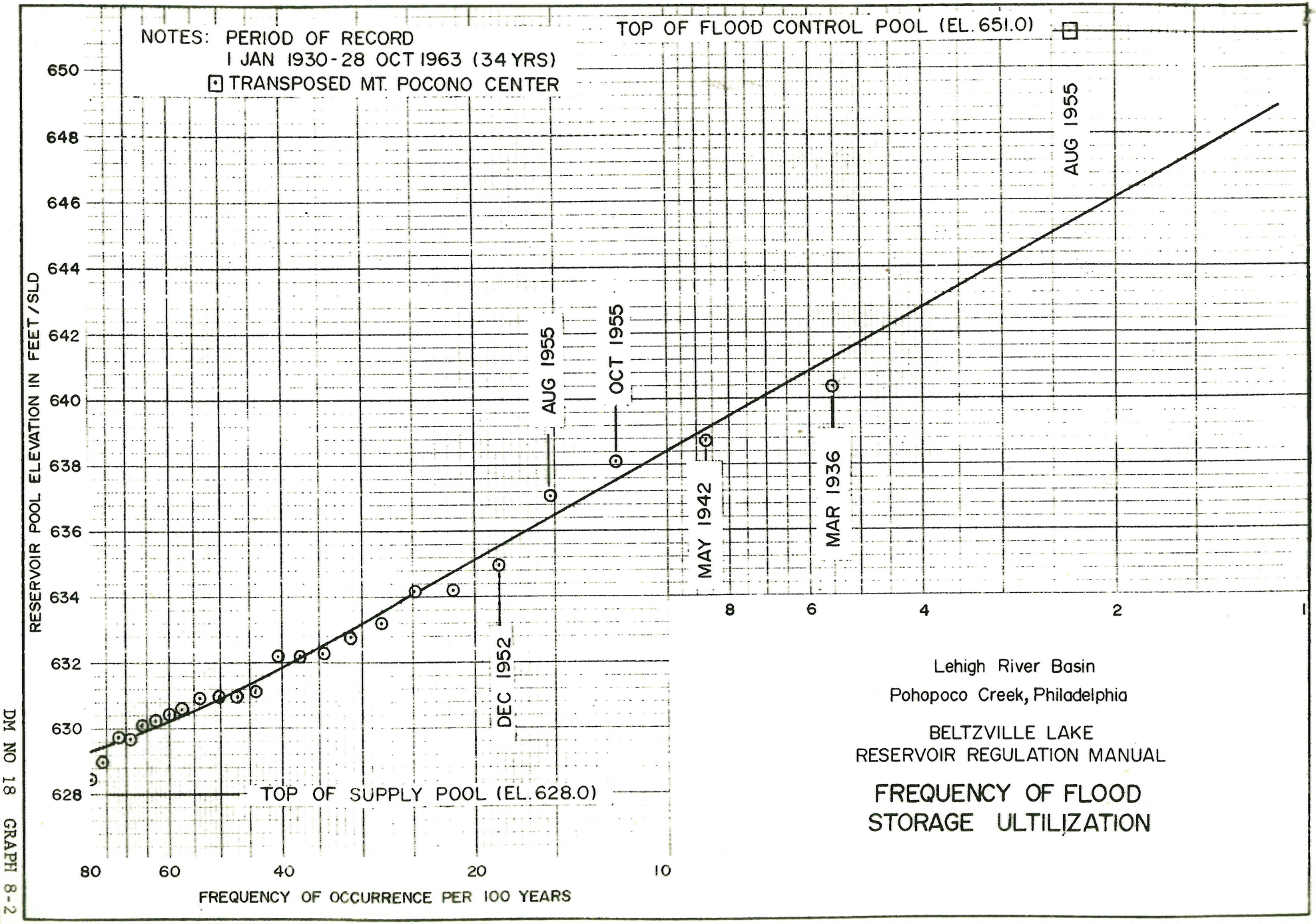
NOTES:

1. DRAINAGE AREA – 96.3 SQ. MILES
2. 1" OF RUNOFF FROM DRAINAGE AREA EQUALS 5136.0 AC.–FT.

Lehigh River Basin
Pohopoco Creek, Pennsylvania

BELTZVILLE LAKE
RESERVOIR REGULATION MANUAL

CAPACITY AND AREA CURVES



Lehigh River Basin

Pohopoco Creek, Philadelphia

BELTZVILLE LAKE
RESERVOIR REGULATION MANUAL

FREQUENCY OF FLOOD STORAGE ULTILIZATION

DW NO 18 GRAPH 8-2

REGULATION SCHEDULE
Flood Control and Water Supply

Schedule	Lehigh River: Lehighton Gage (stage in feet)	Lehigh River: Bethlehem Gage (stage in feet)	Delaware River: Easton Gage (stage in feet)	Beltzville Reservoir: Pool Level (s.l.d.)	Regulation Plan
A*	Below 9.0	Below 13.0	Below 22.0	537 to 628	Maintain reservoir level at or near elevation 628, subject to the following conditions: a. The maximum discharge will be determined from the maximum release schedule according to the existing stage at the Walnutport gage. b. The minimum discharge will not be reduced to less than 35 c.f.s. Maintain temperature of releases below 70° F if possible. c. Releases for water supply will be as requested by the Delaware River Basin Commission. d. Releases for low-flow augmentation will be as requested by the Federal Water Pollution Control Administration provided adequate storage is available.
B	Below 9.0	Below 13.0	Below 22.0	628 to 651	Maximum discharge will be determined from the maximum release table.
C**	9.0 and above	13.0 and Above	22.0 and Above	537 to 651	Release minimum discharge of 35 c.f.s.
D	Control stations not considered				Increase controlled outflow to maximum conduit capacity when reservoir level equals or exceeds the spillway crest elevation. Maintain maximum conduit capacity until the reservoir level recedes below the spillway crest. Regulate outflow to equal inflow until the maximum release schedule can be followed to deplete the remaining flood-control storage when the reservoir level recedes below the spillway crest.

* Stage at each gage must be below indicated level.
** Stage need be exceeded at only one station.

Maximum Release Schedule***
Based on Lehigh River Stage at the Walnutport Gage

Stage - feet	Allowable Release - c.f.s.
Below 4.6	1,500
4.6 to 5.4	1,200
5.4 to 6.3	900
6.3 to 6.7	700
6.7 to 7.2	500
7.2 to 7.6	200
Above 7.6	35

*** Includes ultimate flood-control effect of the existing Francis E. Walter Reservoir and the proposed Aquashicola and Trexler Reservoirs. Release schedule may be adjusted until such time as the Aquashicola and Trexler Reservoirs are completed.

Low-Flow Objectives - c.f.s.

Trenton	2,700
Bethlehem	400
Parryville	35

Reservoir Storage Allocation

Storage Increment (elevation)	Allocation
537 to 628	Water Supply
628 to 651	Flood Control

DM NO 18 CHART 8-1

4

SECTION IX

COST ESTIMATES

9-01 SECOND STAGE ESTIMATES. Detailed cost estimates for construction of the Stage II recreation facilities at the Twinflower and Trinity Gorge areas are in appendix C. Total costs for the two recreation areas based on April 1975 price levels and including 12% for contingencies are estimated as follows:

Estimated Cost - Twinflower	$1,701,800
Estimated Cost - Trinity Gorge	169,600
Subtotal	$1,871,400
Estimated Contingencies - 12%	224,800
Estimated EDS & A - 12%	224,800
TOTAL ESTIMATED COST - TWINFLOWER AND TRINITY GORGE	$2,321,000
Estimated Cost - Planting of Twinflower	$ 61,000
TOTAL ESTIMATED COSTS TWINFLOWER AND TRINITY GORGE AREAS	$2,382,000

Rev June 75

SECTION X
CONCLUSIONS AND RECOMMENDATIONS

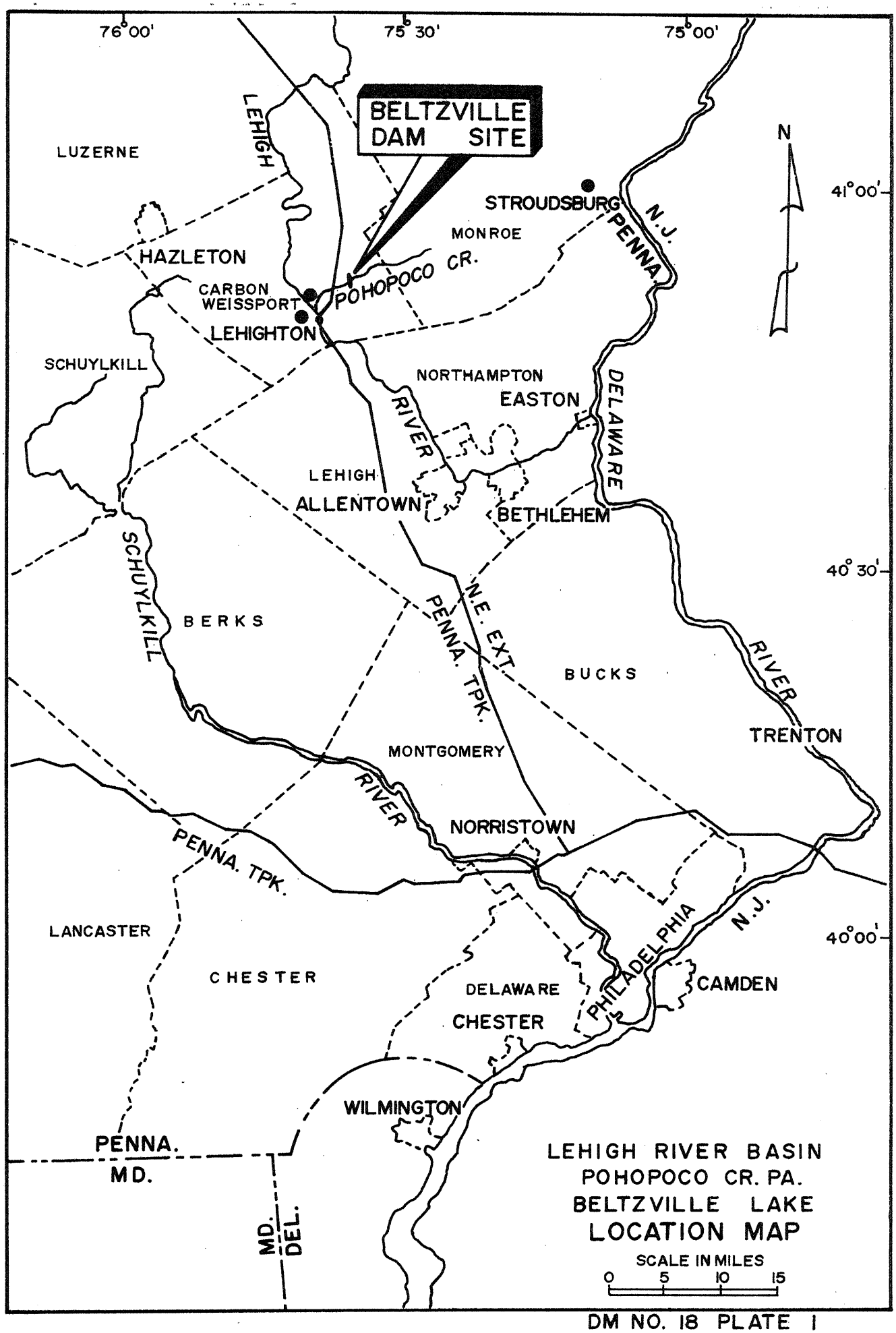
10-01 CONCLUSIONS. Early suspecions that estimated visitation rates would be exceeded, when initial recreation facilities were made available to the public, have become fact. The first few years of park operation seem to indicate that demands for certain types of activities and related services are greater than anticipated. Among those are picnicking and additional parking spaces for active and passive recreationists. Through managerial expertise, the Bureau of State Parks personnel have been able to meet demands by minor expansion of existing picnic areas and development of small picnic areas in selected locations adjacent to the initial road network. More elaborate expansion of boat launching facilities will have to be faced by the Bureau in the near future.

The introduction of new park uses, such as camping, will only tend to raise visitation figures and managerial problems. The future outlook regarding travel limitations is not presently clear. From past indications, the Bureau of State Park capability in getting additional operations and maintenance funds for new facilities continues to be problematical. The development of cost-sharing arrangements appears to be presently difficult at both State and Federal level.

It is concluded that in the present restraining atmosophere, the Corps can best assist the Commonwealth effort by (1) assisting in field operations when personnel and equipment are available, (2) by making resource materials, such as nursery trees, available for park use, (3) by continued seeking of phase 1 and cost-sharing construction funds and (4) by continued liaison with the Bureau to be aware of their needs in regard to our development capability and to be able to respond when the developmental restraints ease.

10-02. RECOMMENDATIONS. It is recommended that this Master Plan be approved in order that it may serve as a continuing basis for orderly development of the public facilities by the Corps of Engineers and other cooperating agencies.

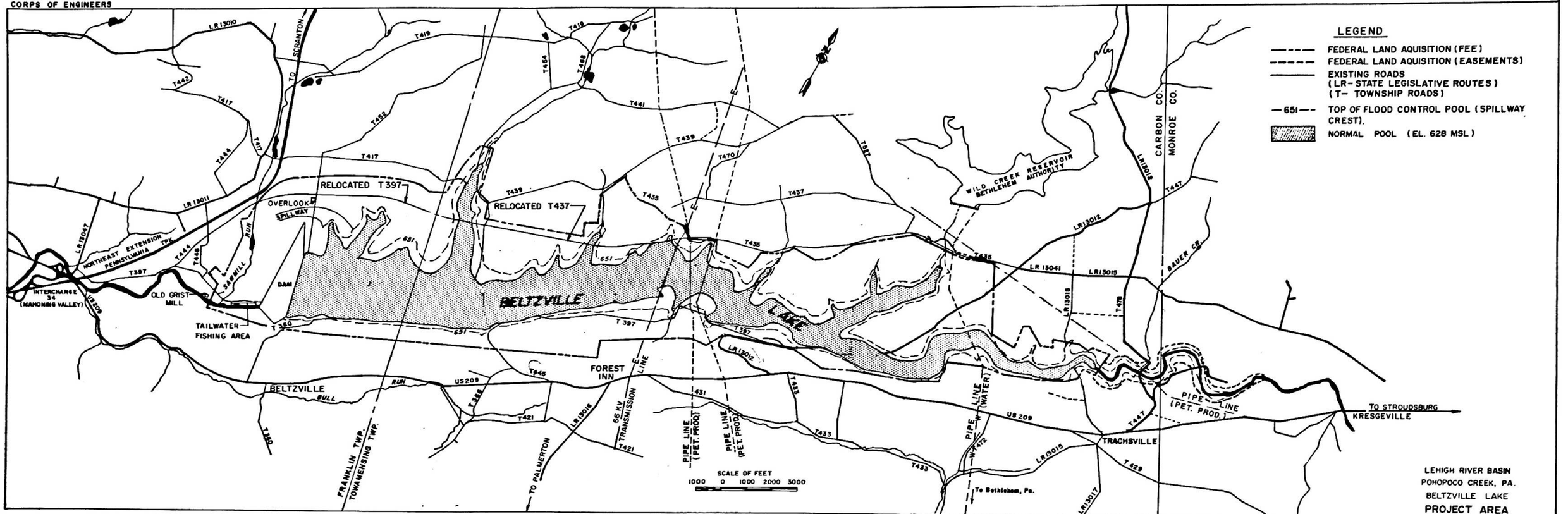
PLATES



DM NO. 18 PLATE 1

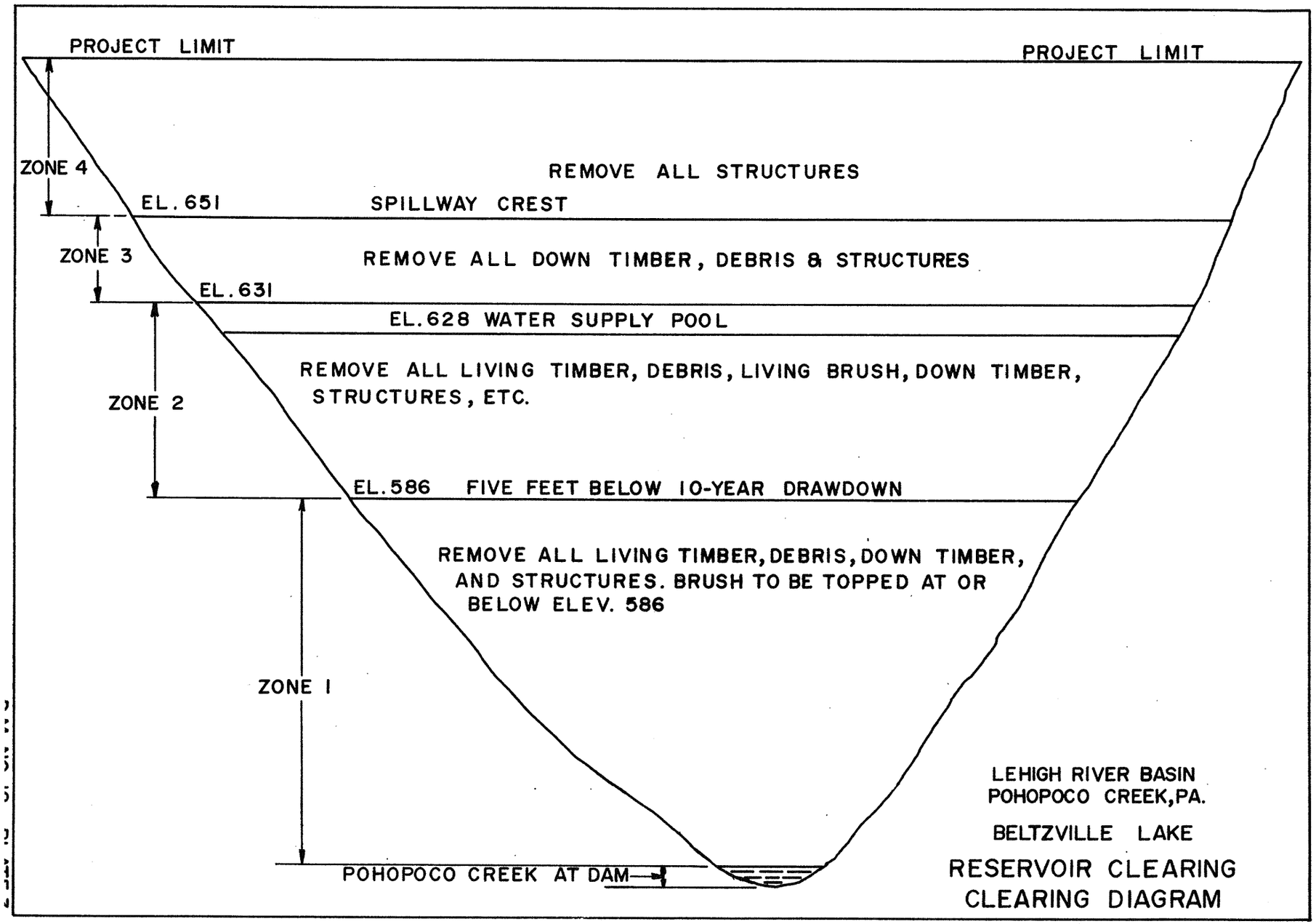
CORPS OF ENGINEERS

U.S. ARMY

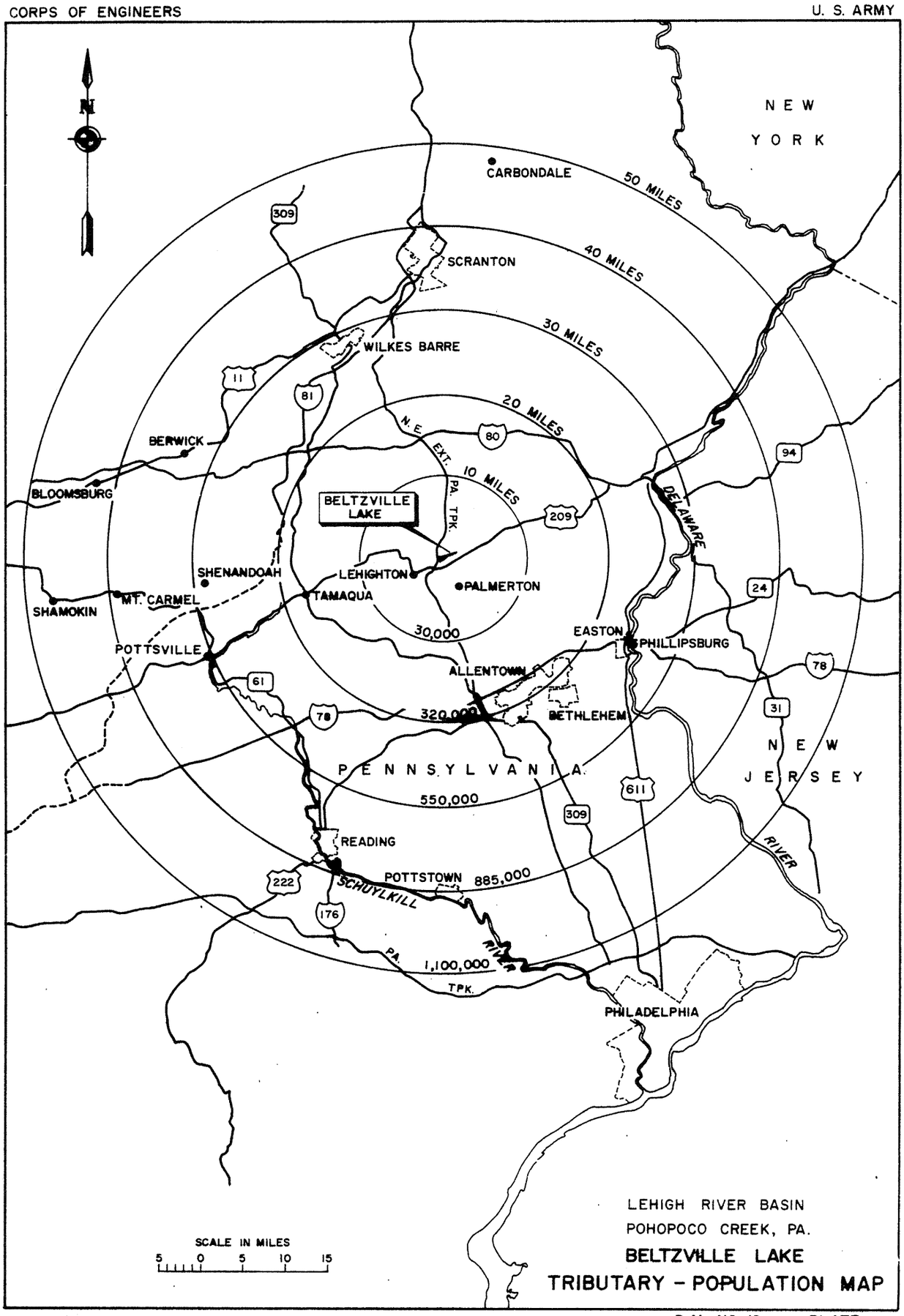


LEHIGH RIVER BASIN
POHOPOCO CREEK, PA.
BELTZVILLE LAKE
PROJECT AREA

D.M. NO. 18 PLATE 2


PROJECT LIMIT
PROJECT LIMIT
ZONE 4
REMOVE ALL STRUCTURES
EL. 651
SPILLWAY CREST
ZONE 3
REMOVE ALL DOWN TIMBER, DEBRIS & STRUCTURES
EL. 631
EL. 628 WATER SUPPLY POOL
REMOVE ALL LIVING TIMBER, DEBRIS, LIVING BRUSH, DOWN TIMBER, STRUCTURES, ETC.
ZONE 2
EL. 586 FIVE FEET BELOW 10-YEAR DRAWDOWN
REMOVE ALL LIVING TIMBER, DEBRIS, DOWN TIMBER, AND STRUCTURES. BRUSH TO BE TOPPED AT OR BELOW ELEV. 586
ZONE 1
POHOPOCO CREEK AT DAM
LEHIGH RIVER BASIN
POHOPOCO CREEK, PA.
BELTZVILLE LAKE
RESERVOIR CLEARING
CLEARING DIAGRAM
CORPS OF ENGINEERS
U.S. ARMY

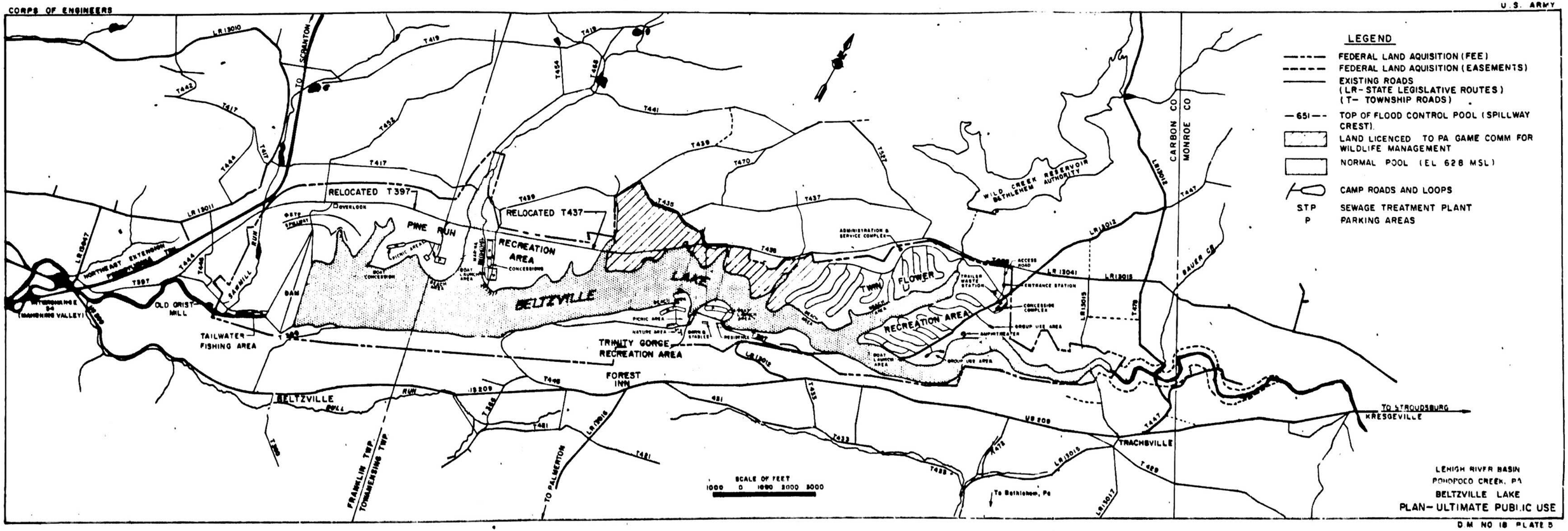
CORPS OF ENGINEERS U. S. ARMY



D M NO 1B PLATE 4

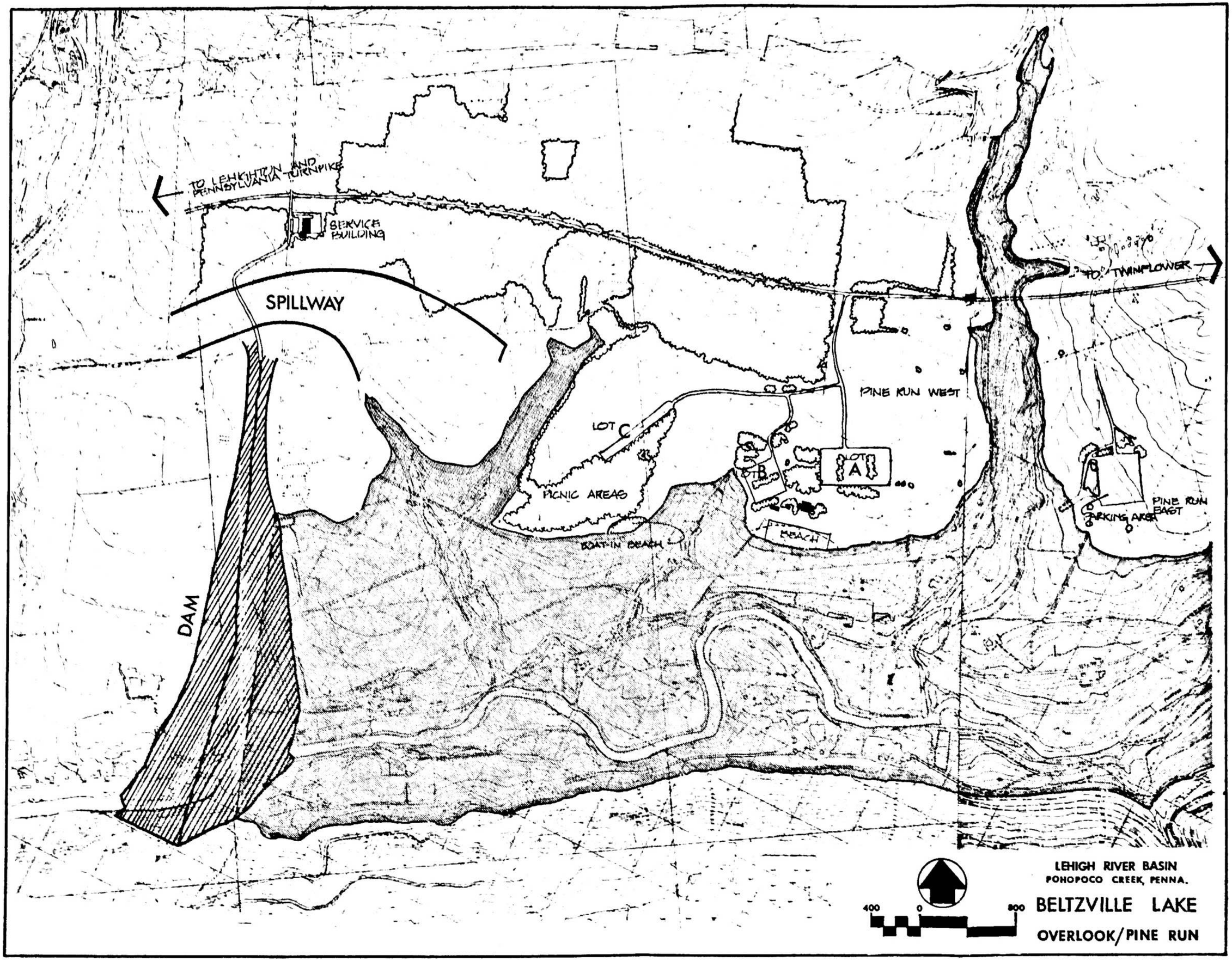
CORPS OF ENGINEERS

U.S. ARMY



LEHIGH RIVER BASIN
POHOPOCO CREEK, PA
BELTZVILLE LAKE
PLAN- ULTIMATE PUBLIC USE

DM NO 18 PLATE 5


TO LEHIGH-NORTHAMPTON PENNSYLVANIA TURNPIKE
SERVICE BUILDING
SPILLWAY
DAM
LOT C
PICNIC AREAS
BOAT-IN BEACH
PINE RUN WEST
LOT B
LOT A
BEACH
TO TWINFLOWER
PINE RUN EAST
PARKING AREA
400
0
800
LEHIGH RIVER BASIN
POHOPOCO CREEK, PENNA.
BELTZVILLE LAKE
OVERLOOK/PINE RUN

NOTE: THE WESTERN CAMPING AREA IS TO BE PLANTED IN ACCORDANCE WITH THE COMMONWEALTH OF PENNSYLVANIA'S DEPARTMENT OF ENVIRONMENTAL RESOURCES, BUREAU OF STATE PARKS.

T-397

TO LEHIGHTON

TO KRESGEVILLE

CAMPING 400 UNITS

PICNIC AREA 70 TABLES

PICNIC AREA 90 TABLES

CAMPING 200 UNITS

TO T-371

PARKING FOR 500 CARS

PICNIC AREA 100 TABLES

PICNIC AREA 80 TABLES

BOAT LAUNCH PARKING 40 CARS & TRAILERS

BOAT BEACH

PREACHER'S CAMP

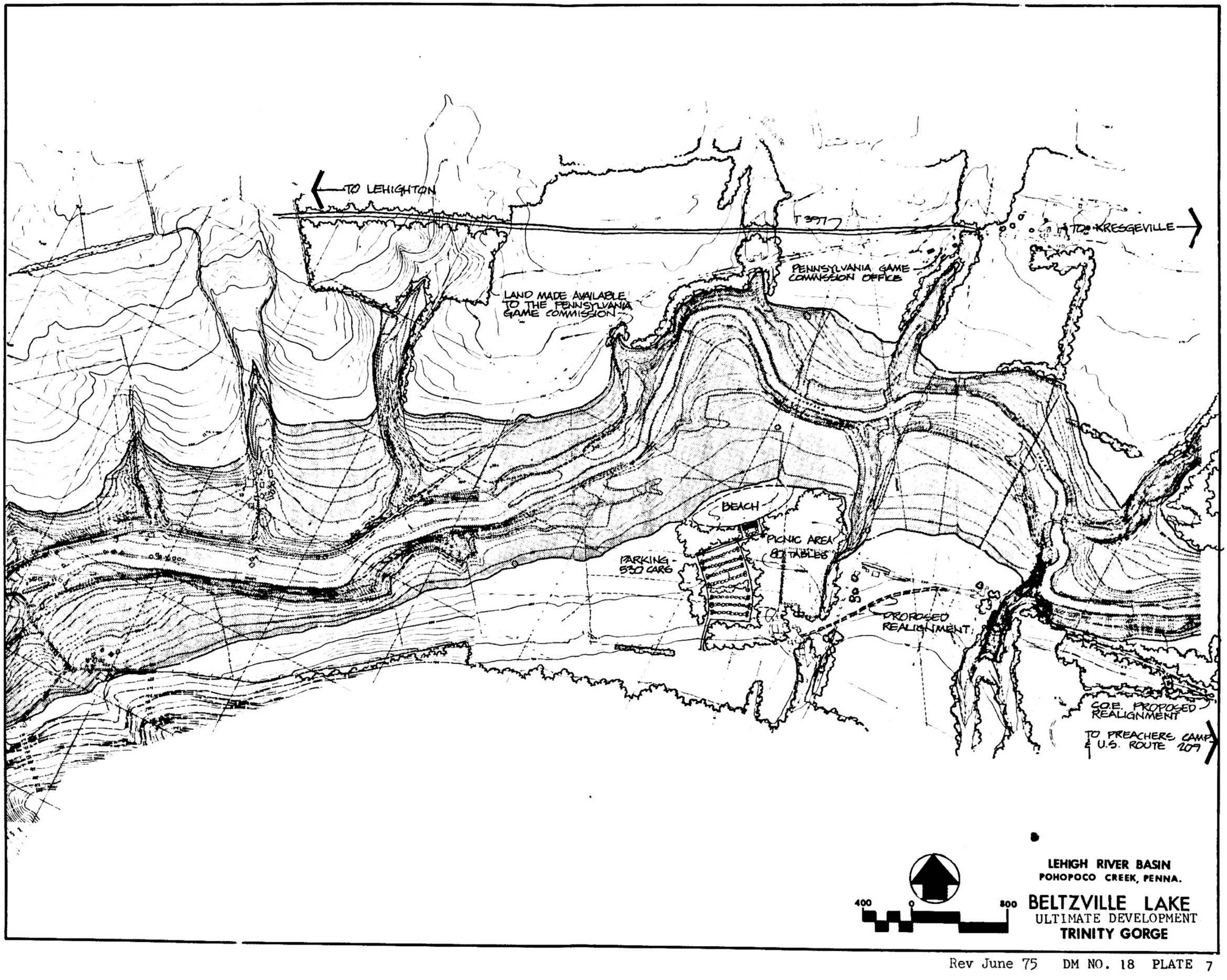
TO TRINITY GORGE

400 0 800

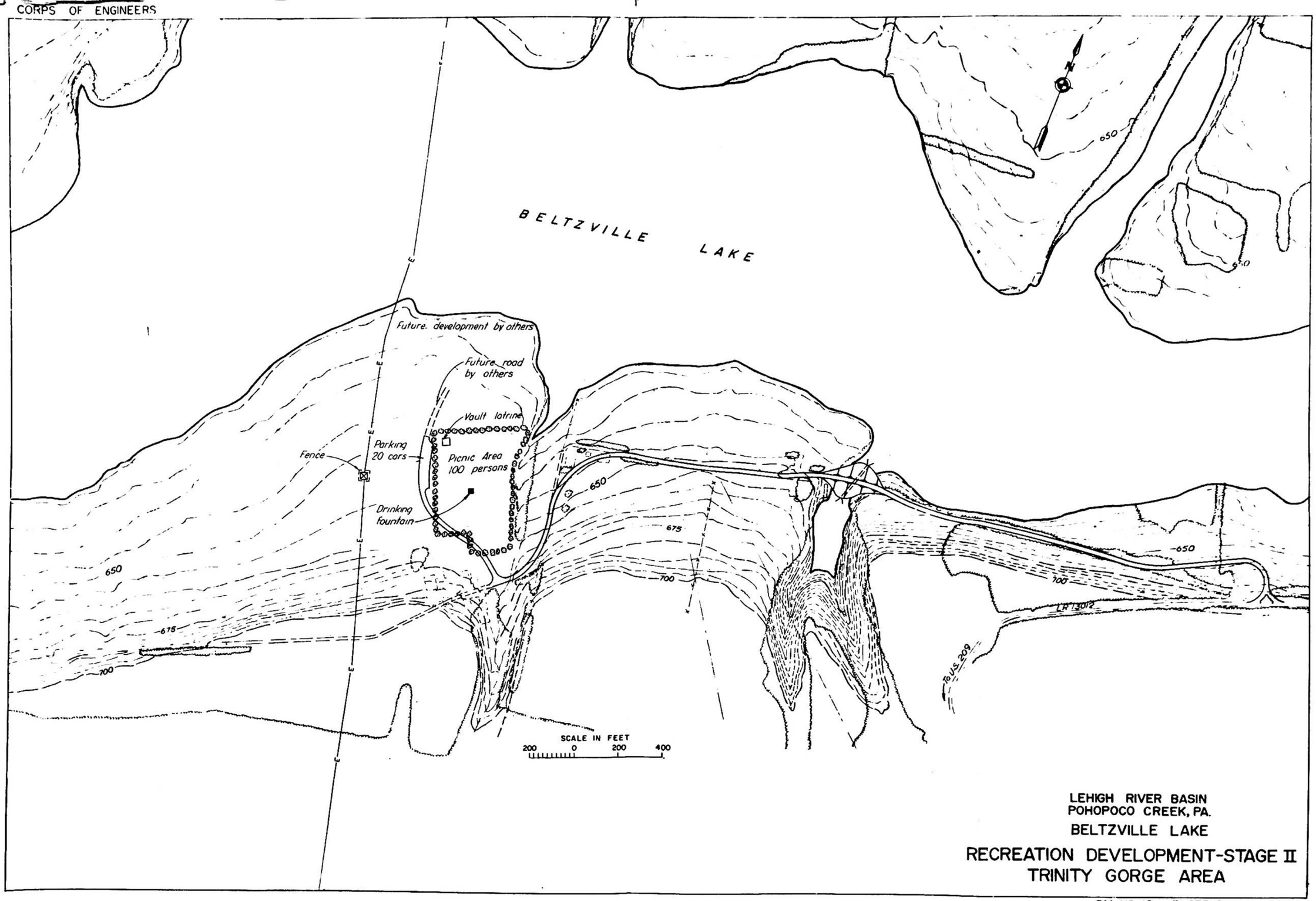
LEHIGH RIVER BASIN
POHOPOCO CREEK, PENNA.

BELTZVILLE LAKE

ULTIMATE DEVELOPMENT
TWINFLOWER


TO LEHIGHTON
TO KRESGEVILLE
LAND MADE AVAILABLE TO THE PENNSYLVANIA GAME COMMISSION
PENNSYLVANIA GAME COMMISSION OFFICE
BEACH
PICNIC AREA 80 TABLES
PARKING 530 CARS
PROPOSED REALIGNMENT
C.O.E. PROPOSED REALIGNMENT
TO PREACHERS CAMP & U.S. ROUTE 209
400
0
800
LEHIGH RIVER BASIN
POHOPOCO CREEK, PENNA.
BELTZVILLE LAKE
ULTIMATE DEVELOPMENT
TRINITY GORGE

CORPS OF ENGINEERS



LEHIGH RIVER BASIN
POHOPOCO CREEK, PA.

BELTZVILLE LAKE

RECREATION DEVELOPMENT-STAGE II
TRINITY GORGE AREA

APPENDIX A

CORRESPONDENCE

A-1 From University of Penna. dtd. 18 Sept. 69, concerning fossil salvage.

A-2 From National Park Service, dtd. 3 Sept 70, submission of final report on fossils.

A-3 From Penna. Dept. of Forests and Waters, dtd. 19 Jan 65, submission of operation and maintenance assurances.

A-4 To Penna. Dept. of Forests and Waters, dtd. 29 Apr 69, concerning cut-back in recreation construction.

A-5 From Penna. Dept. of Forests and Waters, dtd 29 May 69, requesting Corps to rebudget for future recreation construction.

A-6 To Penna. Dept. of Forests and Waters, dtd 30 Apr. 70, concerning lease to operate and maintain recreation facilities.

A-7 From Penna. Dept. of Forests and Waters, dtd, 3 Aug 70, forwarding water quality reports.

A-8 To Penna. Dept of Forests and Waters, dtd. 9 Nov. 70, requesting state plan to improve water quality.

A-9 From Penna. Dept of Forests and Waters, dtd. 23 Dec. 70, reply to A-8.

A-10 From Penna. Fish Commission, dtd. 6 Apr. 70, outlining fishery Management plans.

A-11 From Penna. Dept. of Environmental Resources (formerly Department of Forests and Waters) dtd.2 Jan 75 submission of state operations cost estimate. *

A-12 From Penna. Dept. of Environmental Resources dtd. 28 Apr. 75. Updated water quality report. (Included to show existing conditions in view of the preceeding concerns cited in A-8 and A-9 above.) *

UNIVERSITY of PENNSYLVANIA

PHILADELPHIA 19104

Department of Geology

September 18, 1969

Mr. B. W. Schwartz
Beltzville Resident Engineer Office
U. S. Army Engineer District, Philadelphia
R. D. #4
Lehighton, Pennsylvania 18235

Dear Mr. Schwartz:

It was a pleasure to meet you yesterday and to see your enormous project.

On the basis of our preliminary look, I am happy to say that our proposed collaboration is not likely to encounter many problems. In order to make it possible for us to recommend a site to be developed for recreational fossil collecting by amateurs, we should first make a geological map of the spillway area. I think that we can find one or more students to complete this job under the supervision of a faculty member before winter sets in. Once we have the geologic structure on paper, we should be able to give you a choice of possible locations.

In the interest of safety, we shall work only on Sundays, and we shall always have with us a clearly marked University truck to facilitate identification by guards. In every case we shall notify you by telephone before the weekend selected for work, but it should be understood that we may not appear in case of bad weather.

Many thanks for your assistance. I look forward to working with you.

Cordially,

Henry Faul
(Chairman)

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NORTHEAST REGION
143 SOUTH THIRD STREET
PHILADELPHIA, PA. 19106

IN REPLY REFER TO:
H2219
NER

November 12, 1970

District Engineer
Corps of Engineers District, Philadelphia
2nd and Chestnut Street
Philadelphia, Pennsylvania 19106

Dear Sir:

The attached PROPOSAL FOR A RECREATIONAL FOSSIL COLLECTING LOCALITY, BELTZVILLE RESERVOIR AREA, CARBON COUNTY, PENNSYLVANIA by Dr. Henry Faul of the University of Pennsylvania has been submitted to our Washington Office for the review of the Chief Archeologist.

We are pleased to convey his response to the effect that this Proposal appears entirely valid and should be recommended to the Corps of Engineers. Since the fossils involved are entirely invertebrate, the Antiquities Act would not apply under present interpretations by the Office of the Solicitor of our organization.

The concept has also been proposed by the Service as an interpretive device for Florissant Fossil Beds National Monument in Colorado.

Sincerely,

John L. Cotter, Chief
Archeological Research
Northeast U.S.

Attachment

cc: Chief, Division of Archeology, WASO
Director, NER
Dr. Faul

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF FORESTS AND WATERS
HARRISBURG

THE SECRETARY

P. O. Box 1467

In reply refer to
WCE
F 90:7

January 19, 1965

Col. Elmer P. Yates
District Engineer
U. S. Army Engineer District, Philadelphia
Corps of Engineers
P. O. Box 8629
Philadelphia 1, Pennsylvania

Dear Colonel Yates:

Reference is made to prior correspondence concerning the furnishing of assurances for Beltzville Dam and Reservoir Project.

I am enclosing four copies of the Resolution approved by the Water and Power Resources Board on January 12, 1965.

Sincerely yours,

Maurice K. Goddard

MAURICE K. GODDARD

RESOLUTION

WHEREAS, the Congress of the United States, by Act approved 23 October 1962 (76 Stat. 1173) has authorized the development of the Water Resources of the Delaware River Basin, New York, New Jersey, Pennsylvania and Delaware, substantially in accordance with House Document No. 522, Eighty-seventh Congress; provided that, prior to construction, local interests furnish satisfactory assurances of local cooperation of the funds necessary for such construction; and

WHEREAS, the first project scheduled for construction under the plan is the Beltzville Dam and Reservoir, located on Pohopoco Creek near Lehighton, Pennsylvania; and

WHEREAS, in order that authority may be vested in the United States to proceed with the design of the said reservoir, and to secure the benefits thereof, the Commonwealth of Pennsylvania is willing to furnish the assurances of local cooperation required by the said Act of Congress, and

WHEREAS, the Department of Forests and Waters and/or the Water and Power Resources Board of the Department, acting by and through its Secretary and/or Chairman, respectively, possesses the legal authority to furnish such assurances;

NOW THEREFORE, be it resolved by the Department of Forests and Waters and/or the Water and Power Resources Board of the Department, that the Commonwealth hereby assures the United States that, at such time as the United States shall undertake to construct the said Reservoir, the Commonwealth can and will comply with the following:

(a) The Water and Power Resources Board will prevent encroachments on the stream channels downstream from Beltzville Reservoir to the extent needed to provide reasonably efficient reservoir operations. (Under the Act of June 25, 1913, P. L. 555, as amended by the Act of May 6, 1937, P. L. 559.);

(b) The Department of Forests and Waters will establish and prosecute a program for the acquisition of park lands and to develop facilities, as needed, for the recreation developments assigned to the Commonwealth. Such cooperation contingent upon the appropriation of sufficient funds by the Pennsylvania Legislature. (Under Act No. 8, Special Session, approved June 22, 1964, and Act 195 approved June 5, 1947, P. L. 422.)

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the Department of Forests and Waters to be hereunto affixed on the 12 day of January, 1965.

(SEAL)

Maurice K. Goddard
Secretary

I certify that said resolution was approved by the Water and Power Resources Board on January 12, 1965.

James L. Toothaker
Secretary
Water and Power Resources Board

Maurice K. Goddard
Chairman
Water and Power Resources Board

NAPEN-D

Dr. Maurice K. Goddard, Secretary
Pennsylvania Department of Forests and Waters
P. O. Box 1467
Harrisburg, Pa. 17120

Dear Dr. Goddard:

Continued planning and budgetary limitations have substantially revised the recreational facilities proposed to be constructed by the Corps of Engineers at the Beltzville Dam and Reservoir site. Our current plan, as presented to members of your staff and the Pennsylvania Department of Health in Harrisburg on 10 January 1969, is limited to development of the Pine Run Public Use Area. Verbal assurances were received at this meeting from your staff that the Department of Forests and Waters would operate and maintain this area and complete the recreation development to provide planned facilities at the Trinity Gorge and Twinflower area in accordance with your preliminary master plan.

In view of the substantial change in recreational development to be provided by the Corps of Engineers since the 12 January 1965 Resolution of the Water and Power Resources Board, it is requested that new assurances be furnished that the Commonwealth of Pennsylvania will operate and maintain the Pine Run Public Use Area, including the water and sewage disposal systems, and will develop the Trinity Gorge and Twinflower areas generally in accordance with the preliminary master plan of the Division of State Parks.

Thank you for your cooperation.

Sincerely yours,

JAMES A. JOHNSON
Colonel, Corps of Engineers
District Engineer

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF FORESTS AND WATERS
HARRISBURG
17120

THE SECRETARY

May 29, 1969

Colonel James A. Johnson
District Engineer, Philadelphia District
Department of the Army, Corps of Engineers
Custom House
2 D and Chestnut Streets
Philadelphia, Pennsylvania 19106

Dear Colonel Johnson:

This is in reply to your recent letter concerning development of basic recreation facilities in the Beltzville project area.

The Water and Power Resources Board resolution that was executed by me on January 12, 1965, and subsequent meetings, led me to believe that the Corps of Engineers would be responsible for the construction of recreation facilities and that the Commonwealth of Pennsylvania would operate and maintain these facilities.

It is my understanding now, that because of budgetary limitations, the Corps of Engineers must substantially reduce the recreational development as previously discussed by our staffs.

Under these circumstances, and based upon the January 12, 1965 resolution, it is recommended that the Corps of Engineers proceed with development of the Pine Creek Use Area as presented to members of my staff and the Pennsylvania Department of Health on January 10, 1969, and that the Corps of Engineers rebudget sufficient funds to construct basic facilities as initially agreed to by our respective agencies.

Sincerely yours,

Maurice K. Goddard

MAURICE K. GODDARD

NAPRE-M

20 APR 1970

Dr. Maurice K. Goddard, Secretary
Department of Forests and Waters
Commonwealth of Pennsylvania
P. O. Box 1467
Harrisburg, Pennsylvania 17120

Dear Dr. Goddard:

This is in reference to your application for a lease for Public Park and Recreational purposes at the Beltzville Dam and Reservoir Project, received 26 March 1970. Inclosed you will find five (5) copies of the proposed lease instrument and two (2) copies of the policy abstract from the Department of Defense Directive 5500.11. The leases, including Exhibit "B" are to be executed by your office.

We have also inclosed the copy of the application and exhibits which you submitted for approval. Before returning the signed instruments, the application should be reviewed considering the points outlined below:

1. The first paragraph is not numbered, inasmuch as there are succeeding headings numbered as Roman Numerals II and III. Could this have been meant to be Roman Numeral I?

2. Number 1 under the first paragraph shows the fee acreage as 3,614.89, our calculations indicate the acreage to be 3695 acres.

3. Under No. 2 Improvements, sections referred to as No. 7 should be No. 7A. In addition, it appears headings B and C should be b and c and D and E would become B and C.

4. The buildings now being utilized by you on Tracts 512, 601 and the barn on 600 should be discussed under improvements in the Trinity Gorge Day Use area. There should be some indication of what you plan to do with them.

NAPRE-M
Dr. Maurice K. Goddard, Secretary

5. It appears that Roman Numeral III should be "personnel" instead of "personality".

6. Exhibits referred to in 2A.a, 2B, 2C, are not filled in.

7. Plates referred to in 2A.a, 6. a,b,c,d, E and II are not shown or marked as plates.

8. The date in the upper right hand corner should be completed.

After the necessary adjustments and revisions are made in the application, please have all copies of the lease and Exhibit "B" signed, and return the complete package to us. When the lease is executed on behalf of the Government, a copy will be sent to you for your records.

Sincerely yours,

ERNEST E. SWANSON
Chief, Real Estate Division

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF FORESTS AND WATERS
HARRISBURG
17120

August 3, 1970
Refer SP-P (D)

Colonel James A. Johnson
District Engineer, Philadelphia District
U. S. Army, Corps of Engineers
Custom House
Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

BELTZVILLE STATE PARK
BELTZVILLE RESERVOIR
CARBON COUNTY, PENNSYLVANIA

We have enclosed, for your information, copies of water quality reports for Beltzville Reservoir dated January 17, 1969, and February 13, 1970. These samples were taken at selected locations on Pohopoco Creek by the Pennsylvania Department of Health. These samples indicate that the water quality is unsatisfactory and should not be used for public bathing unless future surveys and sampling (after completion of construction and stabilization of the impoundment) indicates improvement to the water quality at the beach area.

May we have your comments on this situation?

Also, will you please inform us as to the status of the Sewer and Water and Bathing Place Modules that your office is to prepare for us? We in turn, will submit these to the Pennsylvania Department of Health for approval.

BUREAU OF STATE PARKS

Conrad R. Lickel - Director

Enclosure

QA-501 6-64

January 17, 1969
U. S. Region II
est Reading Office

SUBJECT: Streams - Sanitary Survey
Pohopoco Creek
Beltzville Dam
Towamensing Township
Carbon County

Thru: Regional Sanitary Engineer
Director, Div. of Water Quality

TO Joseph Smurda
Assistant Director
Division of Water Quality

FROM Charles H. Kyd
Assistant Regional Sanitary Engineer
Operations
West Reading Office

The Department of Forests and Waters had previously requested that this office collect additional samples for bacteriological analysis on Pohopoco Creek. As you know, there is a dam being built by the Corps of Engineers called the Beltzville Dam. A series of bacteriological samples were collected during the summer of 1968 at a point above the proposed site of the dam. The results of these samples and also sanitary survey of the watershed are contained in the attached copy of our field investigation report. It is to be noted that the bacteriological quality of the water at the present time at the proposed site is above the requirements for bathing. We believe this is due to the fact that there is farming and dairy activities on the watershed. Possibly long-term impoundment will result in a sufficient bacteria die-off to permit bathing; however, this could only be determined in the future, after the dam has been constructed and a resampling survey made. If any further information is required, at this time, please feel free to re-contact this office.

Attachment

A-7A

Streams - Sanitary Survey
Pohopoco Creek
Beltzville Dam Project
Towamensing Township
Carbon County

S. Reg. II
West Reading Office

Department Representative: Ernest P. Koppenhaver, W.P.C.S. I

The Pohopoco drainage above the proposed Beltzville Dam is approximately 60% woodland and 40% agriculture. The overflow from two public water sheds contribute to the drainage above the proposed dam (Lehighton, Pine Run and Bethlehem, Wild Creek).

A population build-up of approximately 40 homes at Kresgeville Village in Polk Township, Monroe County, has on-lot sewage disposal systems. There are several cattle and dairy farms above this point which appear to contribute to the high bacteria count.

The results of bacteriological samples collected during June, July, August, and September are tabulated on attached exhibit "A". The results of these samples indicate that the bacteria count increases progressively upstream into the dairy lands. Cattle were observed at several locations in or near the stream. Exhibit B lists the bacteriological water quality of Pohopoco Creek at our Water Quality Station No. 1-32, located approximately 200 yards above its mouth with the Lehigh River. This station is approximately 6 miles below the first stream sampling point at the T397 bridge and four miles below Sawmill Run. The dam site is just upstream of Sawmill Run on which is located a fish hatchery. This stream will not flow into the impoundment. Since the Water Quality Network station results were high, it was suspected that Sawmill Run contributed to the high count. For this reason sampling upstream from Sawmill Run was conducted during the summer.

The results of this sampling indicate a present bacteriological water quality which exceeds our beach requirements. It is possible that after construction of the dam and with a long term impoundment, there may be sufficient bacteria die-off to meet beach requirements; however, this could only be determined after extensive resampling upon completion of the project and stabilization of the land.

EK:dag
1/15/69

A-76

Exhibit A

Pohopoco Creek Bacteriological Survey for the Beltzville Dam Project

Sampling Station	June 25, 1968	July 15, 1968	August 19, 1968	September 12, 1968
Pohopoco at T397	24,000	3,500	1,100	4,600
Covered Bridge, approx.	2,400	240+	1,100	24,000
2 miles above proposed	9,200			
dam breast				
Pohopoco Cr. at T454	5,400	330	1,100	54,000
Bridge, approx. 4 miles	2,400,000	240+	3,500	5,400
above dam breast	35,000			
Pine Run at Mouth		230		
Pohopoco Cr. at T560			9,200	160,000
Bridge, approx. 15½			24,000	350,000
miles above dam breast				
Pohopoco Cr. at 45053			1,100.	240,000
Bridge, approx. 8 miles			24,000	11,000
above dam breast				

Exhibi

Pohopoco Creek Bacteriological Survey for the Boltzville Dam Project

at Water Quality Network Station No. 1-32

Date	MPN
1-4-64	120,000 - 240,000
2-4-64	4,300
3-4-64	4,300
4-6-64	930
5-4-64	230
6-25-65	430
7-16-65	430
8-22-65	2,400
9-22-65	430
10-21-65	430
11-16-65	2,400
12-21-65	930
1-25-66	2,400
2-15-66	230
3-15-66	790
6- 7-66	220
8-30-66	210
12- 6-66	330
2-21-67	54,000
5-16-67	5,400
8-22-67	790
11- 9-67	2,400
2-14-68	3,500
5- 7-68	790
7-31-68	78
10-29-68	230
	2,400

A-7D

U. S. Region II
West Reading Office
bruary 13, 1970 --

Streams
Pohopoco Creek
Carbon County
Proposed Forests and Waters Dam Project
Beltzville Dam

Joseph Smurda
Delaware River Basin Engineer
Division of Water Quality

Thru: Regional Sanitary Engineer
Director, Div. of Water Quality

Charles H. Kuder
Assistant Regional Sanitary Engineer
Operations

The Department of Forests and Waters had requested additional sampling of Pohopoco Creek at the Beltzville Dam project during the summer of 1969. Samples were collected at bridges on L.R. 13012, 13015, T-454 and T-379 and the results of analyses are tabulated on the attached Exhibit A.

A previous survey had been conducted during the summer of 1968 and the results of this survey can be reviewed by reading our report dated January 15, 1969. This survey indicated that the bacteriological quality of the stream exceeded our beach requirements. This resurvey still indicates high bacteriological water quality, although not as high as in 1968. The Beltzville Dam, which is being constructed by the Corps of Engineers, is nearing completion and so the location of our sampling points had to be changed several times in order to avoid the grubbing operations on the watershed and further due to elimination of several roads and bridges. The description of the watershed remains the same as in our January 15, 1969 report.

It is concluded, based on the resurvey, that the bacteriological quality of the water is still unsatisfactory and should not be used for public bathing unless by future surveys and samplings upon completion of construction and stabilization of the impounded and affected area, the water quality at the proposed beach areas after long-term storage improves.

Attachment

A-7E

F & W DAM PROJECT - POHOPOCO CR.

RESULTS OF ANALYSIS - TOWAMENSING TWP.

CARBON COUNTY

EXHIBIT A

LOCATION & DATE	LAB pH	EST FLOW CFS	TEMP °F	D.O.	M.P.N.	COLOR	ODOR	TURB.	ALK.	TOTAL SOLIDS	B.O.D.	NO_3	NH_3	PO_4
13012 BRIDGE 6-18-69	6.4	40	56	9.2	3,500 5,400 16,000	30	340	20	14	80	1.2	0.5	0.04	0.0
T-379 BRIDGE 6-18-69	6.6	46	56	9.0	7,000 2,400 6,800	25	250	25	10	60	1.2	0.3	0.08	0.0
13012 BRIDGE 7-8-69	6.4	30	62	10.0	5,400 2,200 2,200	20	250	5	26	60	1.4	0.8	0.16	0.14
T-454 BRIDGE 7-8-69	6.4	35	64	9.4	790 1,700 920	20	250	5	12	70	1.0	0.5	0.04	0.14
13015 BRIDGE 8-11-69	6.6	45	60	10.0	1,200 1,300 5,400	15	250	5	12	60	0.3	0.8	0.48	0.0
T-454 BRIDGE 8-11-69	6.5	50	60	10.0	1,300 1,800 1,400	10	250	5	10	60	0.3	0.5	0.32	0.0
13015 BRIDGE 9-15-69	7.0	30	66	9.6	1,100 3,500	10	100	5	16	60	1.0	0.5	0.1	0.0
T-454 BRIDGE 9-15-69	6.7	35	66	8.6	1,100 170	10	250	0	16	60	0.5	0.5	0.1	0.0

A-75

NAPEN-D
Dr. Maurice K. Goddard

Dilution, sedimentation, bacteria die-off, reduced currents at the surface and further control of pollution load will serve to stabilize the impoundment.

The sampling data accumulated show the major pollution load to be entering the stream above Beltzville Lake. Since this load enters the stream above the lake, it is a sanitation problem lying under the jurisdiction of the Commonwealth. May I have an indication of what steps the Commonwealth is taking to reduce the contamination load in the stream to assure that the lake will be safe for the public to use for swimming and other water contact activities?

Inclosed are two sets of the plans, specifications and data pertaining to the water supply facilities for the initial recreation development at Beltzville Lake. These data should be forwarded to the Pennsylvania Department of Health in accordance with the request contained in the inclosed copy of their 3 September 1970 letter. Information concerning the sanitary facilities were forward by my letter of 2 July 1970 to your office for transmittal to the Department of Health. Further water quality sampling for bathing place modules will be accomplished after construction of the facilities and the impoundment has been stabilized.

Sincerely yours,

JAMES A. JOHNSON
Colonel, Corps of Engineers
District Engineer

3 Incl
1. Coliform Study
2. Modules for Water Supply
3. Dept. of Health
   ltr 3 Sep. 70

CF:
Mr. Lickel, Director
Bureau of State Parks

NAPEN-D

Dr. Maurice K. Goddard, Secretary
Department of Forests and Waters
Commonwealth of Pennsylvania
P. O. Box 1467
Harrisburg, Pa. 17120

Dear Dr. Goddard:

This is in response to the 3 August 1970 letter from Mr. Lickel, Director, Bureau of State Parks, inclosing copies of water quality reports for the Beltzville Project and his request for sewer, water and bathing place modules. I am directing my reply to your office since the matter requires coordination with the Pennsylvania Department of Health. A copy of my reply is being forwarded to Mr. Lickel.

We have examined the water analysis data for 1968 and 1969 furnished by Mr. Lickel and find that the sampling was performed upstream of the swimming beach site. We note that the stream carries a heavy pollution load as it approaches Kresgeville. During the period 9 June through 22 September this office conducted a sampling program with four stations located along Pohopoco Creek and four stations located on its major tributaries. Of the 67 samples analysed, 13 showed bacteriological intensities that exceed Department of Health standards. Our sampling also showed that pollution increased as sampling proceeded upstream. A table showing our results is attached.

We are concerned about the continued existence of appreciable pollution in this stream, as we have contracted for the construction of bathing facilities at Beltzville Lake. It would appear that the data now available cannot be construed to demonstrate that the water in the vicinity of the beach will necessarily be contaminated and unfit for swimming.

BELTZVILLE LAKE
COLIFORM ORGANISIMS (MPN PER 100 ML)
1970 TESTING PROGRAM

STATION	LOCATION	9 Jun	24 Jun	30 Jun	4 Aug	18 Aug	25 Aug	1 Sept	8 Sept	15 Sept	22 Sept
1	Pohopoco Cr, 1.1 mi. above Kresgeville and 11.2 mi. above Dam	2,400	348	2,400	3,480	2,400	330	3,480	460	490	230
2	Pohopoco Cr, below Kresgeville at Rt. 209, 10 mi above Dam	348	542	33	490	790	1,720	790	790	490	1,300
3	Wild Cr, at traffic Rt 435	2,400	70	542	80	80	20	50	230	170	20
4	Pohopoco Cr, at Stone Br., traffic Rt 454	240	141	221	130	20	80	20	50	230	80
5	Small Stream, 2.7 mi above Dam at relocated traffic Rts T397 & T435	-	46	79	130	1,300	-	-	-	-	-
6	Pine Run, at abandoned traffic Rt. T397, 1.5 mi above Dam.	-	348	348	790	-	24,000	5,420	490	2,210	80
7	Sawmill Run, at traffic Rt. T397, below Dam	1,300	240	141	220	490	330	330	20	240	140
8	Pohopoco Cr. at gaging station below Dam	-	-	-	-	-	790	170	20	50	20

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF FORESTS AND WATERS
HARRISBURG
17120

THE SECRETARY

P. O. Box 1467

In reply refe
WCE
F 90:7

December 23, 1970

Col. James A. Johnson
District Engineer
U. S. Army Engineer District, Philadelphia
Corps of Engineers
Custom House - Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

Dear Colonel Johnson:

As requested in your letter of November 9, 1970, we have forwarded the plans, specifications and data pertaining to the water supply facilities for the initial recreation development at Beltzville Reservoir to the Pennsylvania Department of Health. A copy of this information is also being sent to Mr. John R. Boffenmyer, Sanitarian, Department of Health, Pottsville, Pennsylvania.

The Department of Health has reviewed the bacteriological results of Pohopoco Creek and is particularly concerned about the Beltzville Reservoir being used for bathing purposes since samples indicated high coliform results. The "most probable number total coliform" test does not differentiate between fecal coliforms, from the intestinal tract of warm blooded animals which is the source of pathogenic bacteria, and other sources of harmless bacteria from runoff. Although they are using a "total coliform" requirement as a bathing place requirement, they are taking steps to change to a fecal coliform requirement. As a result of this, they are planning to continue sampling of Pohopoco Creek and perform both total and fecal analyses. Their field staff will review the bacteriological results and make sanitary surveys to see if the sources of waste can be located and corrected.

As a matter of information, on January 12, 1971, the Sanitary Water Board is holding a public hearing in Bethlehem, Pennsylvania, to consider recommended water quality standards for the Lehigh River Basin and tributaries of the Delaware River between the Lehigh River and Tocks Island. The Pohopoco Creek watershed will be included.

On an overall basis, the Pennsylvania Department of Health is confident that the water quality of the Beltzville Reservoir can be improved and used for bathing purposes.

Sincerely yours,

Maurice K. Goddard

MAURICE K. GODDARD

MONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH COMMISSION
Division of Fisheries
Benner Spring Fish Research Station
R. D. #1, Box 200-C
Bellefonte Pennsylvania 16823

April 6, 1970

Mr. John Kessler
U. S. Army Corps of Engineers
Custom House, 2nd & Chestnut Streets
Philadelphia, Pa. 19106

Dear John:

The management plans for the Beltsville Dam call for a warmwater fishery. The species to be stocked are muskellunge, chain pickerel, largemouth bass, walleye, and black crappie.

We would like to have a reasonably stable water level while the muskellunge spawn. This is usually at a water temperature of about 54°F. The water should not drop appreciably for at least three weeks after this water temperature is reached.

We would like to know when you plan to impound water and at approximately what rate, so that we may better plan our stocking program.

If you desire any further information, please write.

Sincerely,

Jack G. Miller

Jack G. Miller
Aquatic Biologist

ns

DEPARTMENT OF ENVIRONMENTAL RESOURCES
COMMONWEALTH OF PENNSYLVANIA
~~DEPARTMENT OF FORESTS AND WATERS~~
HARRISBURG

April 6, 1971
Refer to: SP-OM (O)

Mr. Jeff Radley
Philadelphia District
Corps of Engineers
Department of the Army
2D and Chestnut Streets
Philadelphia, Pennsylvania 19106

REPORTING PROCEDURES
REQUIREMENTS OF THE DEPARTMENT
OF ARMY LEASE AGREEMENTS
BELTZVILLE STATE PARK

The following information is a report on Beltzville State Park:

BUDGET FOR CALENDAR YEAR 1971

Object 100	(Salaries)	$ 7,772.00
Object 121	(Wages)	13,428.00
Object 300	(Materials and Supplies)	5,500.00
	TOTAL	$ 26,700.00
400	Capital Equipment	$ 6,389.00

BUREAU OF STATE PARKS

James D. Lesher, Chief
Operations and Maintenance

A-11

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF ENVIRONMENTAL RESOURCES

Beltzville State Park
R. D. #3, Box #252
Lehighton, Pa. 18235
April 28, 1975

Mr. John Lakatosh
Environmental Branch
U. S. Army Corps of Engineers
Custom House
Second and Chestnut Streets
Philadelphia, PA 19106

Dear Mr. Lakatosh:

As per our recent telephone conversation, listed below are the fecal coliform bacteriological test results of Beltzville State Park's swimming water. The beach was open from May 25, 1974, to September 2, 1974, inclusive.

Date	Beach East Results	Beach West Results
5/26/74	0	0
6/2/74	4	0
6/9/74	0	0
6/16/74	0	0
6/23/74	4	2
6/30/74	18	0
7/7/74	127	89
7/14/74	296	355
7/21/74	172	37
7/28/74	225	7
8/4/74	0	0
8/11/74	12	34
8/18/74	3	110
8/25/74	14	20

It should be noted that the test samples were taken on Sunday afternoons during the period of heaviest usage.

If you need additional information or have any questions on the information listed above, please contact this office.

Very truly yours,

Renee G. Smith

(Miss) Renee G. Smith, Secretary
to A. J. Lupino, Park Superintendent

rs

APPENDIX B

REPORTS BY OTHER AGENCIES

B-1 Proposal for a Recreational Fossil Collecting Locality - by University of Penna. for National Park Service.

B-2 Wildlife Management Plan - by Penna. Game Commission.

PROPOSAL FOR A RECREATIONAL FOSSIL COLLECTING LOCALITY

BELTZVILLE RESERVOIR AREA,

CARBON COUNTY,

PENNSYLVANIA

TO: The National Park Service and
The Corps of Engineers

FROM: The Department of Geology,
University of Pennsylvania

JUL 3 0 1970

ABSTRACT

The waters of the Beltzville Reservoir will flood a famous fossil collecting locality which has long been popular with teachers, students, and amateur collectors. Direct extension of the fossil-bearing layer does not lead to suitable areas on dry land, but a detailed geological survey of the area has shown that the same bed, displaced by folding, occurs on Federally-owned land in the immediate vicinity of the future reservoir. The fossils are identical and the bed is equally rich as in the flooded area. A highly satisfactory fossil collecting area could be made by a few cuts with an earth-moving machine in either one of two possible locations here proposed.

LOCATION

The Beltzville Reservoir is located in Carbon County, Pennsylvania, about 2.5 miles east of the Mahoning Valley Exit of the Northeast Extension of the Pennsylvania Turnpike. The construction is now completed and the filling of the reservoir is expected to begin within a year. When the reservoir has reached full level, an important paleontological locality will have been flooded.

This locality, called "Pohopoco Creek", is well known to professional and amateur fossil collectors (see Haskins,

D., 1964, Fossil Collecting in Pennsylvania, General Geology Report G 40, p. 57). The outcrop is a steep cut on the north side of a now abandoned road on the right bank of Pohopoco Creek, and is a favorite target of geology field trips from colleges and universities in Eastern Pennsylvania and adjacent New Jersey. In spite of its considerable importance, the fauna of this area has not been previously studied and a long-term project intended to provide a full description of this material has begun in the Department of Geology in the University of Pennsylvania as an outgrowth of a grant from the National Park Service, made in 1968.

STRATIGRAPHY

The rocks exposed here are of Middle Devonian (Hamilton) Age. Preliminary faunal identifications indicate that the fossiliferous layer is in the lower part of the Frame Shale member of the upper Mahantango Formation. This is higher in stratigraphic sequence than the well-known "Centerfield Reef" in Monroe County.

STRUCTURE

The flooded locality lies on the southern limb of an anticline of which the northern limb is locally overturned in the area of the dam. By coincidence, an excellent exposure of this limb was found in the spillway of the dam, especially in the northern cut. The strike of the fossil-

iferous layer cuts the spillway wall at an acute angle in two places, because of the curvature of the spillway, so that accurate extrapolation is possible to determine the exact position of the fossil-bearing layer under the woods and meadows adjoining the northern waterline of the reservoir. The slope of the land in two places is sufficient to make possible the excavation of a bank sufficient for good fossil collecting and adequately drained.

PROPOSED LOCATIONS FOR A FOSSIL COLLECTING AREA

Originally it was thought that a number of blocks from the present Pohopoco Creek locality could be moved to a higher location where they would not be flooded by the waters of the dam, and where they could be available to fossil collectors. Upon closer study of this proposal, it was concluded that the need of recreational fossil collectors exceeds the capacity of earth-moving machinery. Any amount of the fossiliferous material would soon be reduced to pea-size gravel, especially when it became obvious to the collectors that the supply is limited.

The new spillway, especially its northern wall, shows several richly fossiliferous layers, but it is assumed that the Corps of Engineers would not wish to encourage fossil collecting in the spillway itself. The walls of the spillway are too steep for safety and the collecting activities of diligent amateurs would produce a fair amount

of talus.

Using the spillway exposure as a basis of a detailed study, Mr. Warren Hirt, a senior in the Department of Geology, has produced an extrapolation (see map, attached) of the fossiliferous layers to two possible areas where cuts suitable for fossil collecting by amateurs could easily be made by relatively minor earth-moving operations. Mr. Hirt's report is attached.

LOCALITY NUMBER 1.

Locality number 1 lies on the 690 foot contour in a meadow about one-half mile east of the present office of the resident engineer, about 100 yards south of the highway. Three test pits have been dug in this meadow and the northernmost pit lays bare part of the fossiliferous zone, confirming the correctness of the extrapolation. The pit also shows that overburden is very thin here and that the rock is weathered, which fossil collectors consider to be an asset. The best spot for the proposed fossil collecting locality would be slightly west and south of the northernmost test pit, where the slope of the land steepens and proper drainage of the collecting pit thus would be easy to obtain.

LOCALITY NUMBER 2.

The second locality lies in the meadow north of the

western end of the spillway, about 1,200 feet exactly west of the southern abutment of the bridge across the spillway, between the 640 and 660 foot contours. The slope in this area is less favorable than at Location 1, and nothing is known about the depth of overburden, except as extrapolated from the spillway. Area number 2 was marked "number 2" on the preliminary report submitted April 10, 1970. The other locations shown on that map have now been abandoned for various reasons.

WORK PROPOSED

It is suggested that the Corps of Engineers determine which of the two localities would best integrate into the overall plan of recreational facilities at the reservoir.

Once this decision is made it is suggested that an earth-moving machine equipped with a ripper be made available, perhaps while other excavations are being made for parking lots, roads, etc. It is expected that no more than one day's time of this machine would be required.

A paleontologist should be present as the cut is being made, to direct the operator and avoid excessive digging of unfossiliferous material. The instructions to the machine operator should be sufficiently general to permit moving the cut a small distance across strike to provide optimum location. It would be costly to find the exact location of the proposed cut prior to the excavation.

We propose that University of Pennsylvania paleontologists make a detailed examination of the newly exposed cut and collect a stratigraphically oriented suite of fossiliferous rock. The material will be prepared and studied in the laboratories at the University. It can be then either stored at the University or, if there is material of exhibit quality, incorporated into the museum at the Beltzville site.

It is suggested that the new fossil collecting locality be made accessible only by foot from the nearest parking lot. It may be desirable to erect a small marker in the area, giving pertinent geological information.

Respectfully submitted,

Henry Faul

Chairman, Department of Geology
University of Pennsylvania

Distribution:

National Park Service, 3 copies
Corps of Engineers, 4 copies
Pennsylvania Geological Survey, 2 copies

The Structure and Stratigraphy of the Middle and Late Devonian Units near Lehighton, Pennsylvania

By
Warren G. Hirt
Senior Research Project
Department of Geology,
University of Pennsylvania
July 1, 1970

Introduction

The purpose of this study is to map the structure and stratigraphy of a small area of the Lehighton Quadrangle, Pennsylvania. The study area is bounded on the South by the Blue Mountains, on the North by Indian Hills, on the West by the meridian 75° 41' 30'' W, and on the East by 75° 36' 48''W (see Plate 1). An extensive, new outcrop of the Mahantango Formation has been exposed in the Pohopoco valley at the site of the Beltzville Dam Spillway. Based on a detailed study of this area, a recommendation is being made for the location of a new fossil collecting site, representative of the Mahantango fauna, to replace the old locality, which, upon completion of the dam, will be submerged.

Previous Studies

The stratigraphy was first described by Willard (1939) and modified by Klemic et.al. (1963). Klemic proposed that Willard's Rush and Fort Littleton Formations of the Portage Group be combined and called the Trimmer's Rock Sandstone of the Susquehanna Group. Klemic's nomenclature has been adopted in this paper. Estimates of the thickness of formations (Willard 1957) have been combined to conform to this modification.

The structure of the northern half of the study area has been described by Klemic et.al. (1963). Some work has been published on the southern region by Willard (1957). Work conducted for this study is a verification and extension of Klemic's repor..

Acknowledgements

The author would like to acknowledge Dr. H. Faul, for his review of this thesis, and Dr. R. Shagam and Dr. R. Giegengack, of the University of Pennsylvania, for their helpful comments and suggestions in the field. The paleontology of the area was determined by Mrs. C. Faul and Miss G. Hoffman. Special thanks is offered to Miss J.Hoagland for her help both in the field and in preparing this report.

Physiography

The area under investigation lies in the Valley and Ridge Province of Pennsylvania. The region consists of a series of parallel ridges and valleys with about 500 feet of relief. The Lehigh River and its tributaries, Pohopoco Creek, Pine Run Creek, Sawmill Run Creek and Fireline Creek constitute the major drainage pattern.

Stratigraphy

The area under investigation consists of the Hamilton and Susquehanna Groups, covering the time span of Middle to Late Devonian. The Hamilton Group is composed of the Marcellus and Mahantango Formations. The Susquehanna Group consists of the Trimmer's Rock sandstone and the Catskill Formations.

Marcellus Shale

The Marcellus Shale consists of black, fissile, unfossiliferous shales. The clay fraction is mainly chlorite and

illite (Klemic et. al. 1963). The silt fraction consists of quartz and albite-twinned feldspar.

The well defined lower contact between the Marcellus and SelinsgroveLimestone marks the border between the Early and Middle Devonian. The upper contact with the Mahantango Formation is graditional. The Marcellus is 640 feet thick.

Mahantango Formation

The Mahantango Formation consists of black, brown and green, sandy to silty shales. Analysis of thin sections shows that the Mahantango consists mainly of quartz, chlorite and hematite. The chlorite is normally alined with cleavage and graded bedding can be found. Accessary minerals of muscovite and pseudomorphic pyrite are also present.

Based on faunal assemblages, the Mahantango can be divided into three members. The contacts between these membersare gradational, but three horizons can readily be distinguished in the field, as exposed in the Beltzville Dam Spillway.

The Skaneateles facies is a black and brown unfossiliferous shale with abundant "storm-rollers." A storm-roller is believed to be a sedimentary feature composed of spheroid shale, built up concentrically about a sandstone core. It is believed to be a feature of shallow, agitated waters or of movement on a submarine slope (Willard, 1957). Some storm-rollers reach a diameter of 6-8 feet. The author questions their sedimentary origin because storm-rollers tend to be alined with the long

axis parallel to cleavage rather than bedding, as exposed at Station 3 (see Plate 1).

The Ludlowville member is composed of shales which Willard (1939) correlated to the Centerfield bioherm of New York. Large Rugose corals, bryozoans, brachiopods and trilobites are present.

The Moscow member consists of brown, sandy shales which contain Pelecopods, Trilobites, Brachiopods and Crinoids.

The contact between the Mahantango Formation and the Burket shale member of the Trimmer's Rock sandstone is gradational and marks the boundary between the Middle and Late Devonian. The contact is exposed in the Beltzville Dam Spillway. The thickness of the Mahantango Formation is estimated to be 1,560 feet.

Trimmer's Rock Sandstone

The Trimmer's Rock Sandstone is the combination of the Burket shale and Trimmer's Rock sandstone of the Portage group as described by Willard (1939).

The Burket shale member is a fissile, black to rusty shale. The Bruket shale grades laterally into the Trimmer's Rock sandstone and is no longer present on the east side of the Lehigh River. The estimated thickness is 116 feet.

The Trimmers Rock sandstone consists of gray sandstones and interbedded shales and siltstones. The contacts between sandy and silty layers are sharp. The sandstones are composed mainly of quartz and albite-twinned feldspars..It is described

as a low grade graywacke (Klemic et.al. 1963). Brachiopods and cross-bedding are present in the lower portion and plant fossils have been reported near the top (Klemic et.al. 1963).

The upper contact of the Trimmer's Rock Sandstone is defined as the first redbed of the Catskill Formation. Willard (1957) estimates the thickness to be 1,550 feet.

Catskill Formation

The Catskill is divided into five members, the Walcksville sandstone, the Beaverdam Run member, the Damascus member, the Honesdale sandstone and the Cherry Ridge redbed. In the area studied, only the lower Walcksville sandstone was observed.

The Walcksville sandstone is the basal non-marine member with reported plant fossils (Klemic et.al. 1963). It consists of red and green very fine to fine grain sandstones. Redbeds comprise about 50% of the thickness. The upper contact is reported to lie outside the area under study.

Igneous and Metamorphic Rocks

No igneous rocks have been found in the study area. Metamorphism, for the most part, is negligible. Only low grade slates have been found.

Structure

The regional structures are the large, asymmetrical Bowmansville synform in the southern half of the area and the Lehighton Antiform in the northern section. Flow-clevage,

bedding-plane faults and three sets of joints have been observed.

Folds

The Bowmansville synform trends N 65° E. The southern limb dips 60° N (Stations 3,4, and 5, see Plate 2). The northern limb dips about 25° S (Stations 6, 7, 8, and 10). Bedding in the Hamilton Group is extremely difficult to define due to the predominance of cleavage. The anomalous south dipping beds of stations 1 and 2 may be cleavage and not bedding. Superimposed on the Bowmansville synform are a series of small synclines which trend in the same direction as the synform.

The Lehighton Antiform is asymmetrical and locally overturned. It trends N 65° E. The southern limb dips at 45° S (Stations 8, 11 and 12) and the northern limb dips at 67°N, near Pine Run Creek (see Plate 1). In the vicinity of the Turnpike, the antiform is overturned and dips about 80° S. (Stations 13, 14, 15, and 16). Graded bedding in thin sections from station 13 and trunkated cross-bedding at station 16 indicates overturned bedding.

Cleavage

The most interesting feature of cleavage is that it remains uniform over the entire area under investigation. Flow cleavage strikes N 65° E and dips 40-60° S (Stations 3, 4, 5, and the Pine Run Traverse). On the overturned limb of the anticline, cleavage parallels bedding and dips about 80° S.

Klemic et.al. (1963) found that in the Lehighton Antiform, slicken-sides occurred along cleavage planes parallel to bedding planes, indicating that cleavage was related to folding. However, in the Bowmansville synform, slicken-sides occur on cleavage planes that do not parallel bedding. This flow cleavage strikes and dips the same as seen in the antiform. If the two cleavages are the same, it would indicate that the Bowmansville synform preceeded the formation of the regional cleavage. This would suggest two movements, folding and movement to develop cleavage. The presence of another cleavage is also implied but, to date, such a cleavage has not been observed. Further study is necessary before conclusions can be drawn.

The direction of the slicken-sides indicates a movement to the Northwest.

Jointing

Similar to Klemic et.al. (1963), three sets of joints can be found in the region investigated. J_1 trends N 45° E to S 85° E and dips 50-90° S (Station 14). J_2 trends N 10° W to N 40° W and dips 70-90° S (Stations 4, 5, 6, 7, and 8). J_3 trends N 10° E to N 25° E and dips 70-90° S (Stations 4, 5, 6, 7, and 8). None of the joints have been deformed indicating that jointing occurred after deformation and cleavage.

Economic Geology

The proposed fossil collecting locality lies on the

overturned limb of the Lehighton Antiform in the Moscow member of the Mahantango Formation. It is located in a field just east of Station 13 and will lie near the shore of the artificial lake (See Plate 1, locality 1.).

Geologic History

The gradual change in lithologies from the black, deep marine, Marcellus shale to the shallow water, bioherms of the Mahantango to the continental redbeds of the Catskill indicate a regressing shoreline from the Middle to the Late Devonian. Evidence indicates (Klemic et.al. 1963) that the rocks were not deformed until the Pennsylvanian or later. Evidence has been presented in this paper to show that folding occurred rior to the northwest movement that created a regional cleavage. Finally jointing occurred after cleavage.

Conclusions

In conclusion I would like to suggest future projects for the area:

1) A detailed survey of the cleavage of the region should be undertaken to determine whether the flow cleavage is related to folding.

2) Accurate location of the geologic contacts has not been determined. The positions of the contacts located on plate 1 have been inferred from the strikes and dips of a few outcrops.

3) Detailed geologic logging of about 200 cores and four Calyx holes is necessary to obtain accurate estimates of thicknesses.

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1) Hirt W., unpublished, Preliminary Report on the Stratigraphy and Structure of the Magantango Formation near Lehighton, Pennsylvania.

2) Klemic H., Warman J., and Taylor A., 1963, Geology and Uranium Occurrences of the Northern Half of the Lehighton Pennsylvania, Quadrangle and Adjoining Areas, U.S. Geol. Survey Bull., no. 1138, pp. 1-94.

3) Willard B., 1939, The Devonian of Pennsylvania, Pennsylvania Geol. Survey, fourth series, Bulletin G-19, pp. 154-320.

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Plate 1.

(See pocket in back of binder.)

PLATE 2.

EQUAL-AREA LOWER HEMISPHERE STEREOGRAMS

LEGEND

S Station Number

C Contours

P Points Contoured

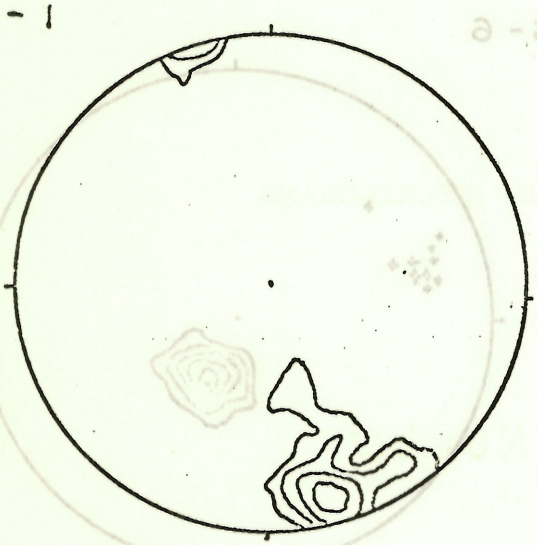
△ Cleavage

○ Joint 1

× Joint 2

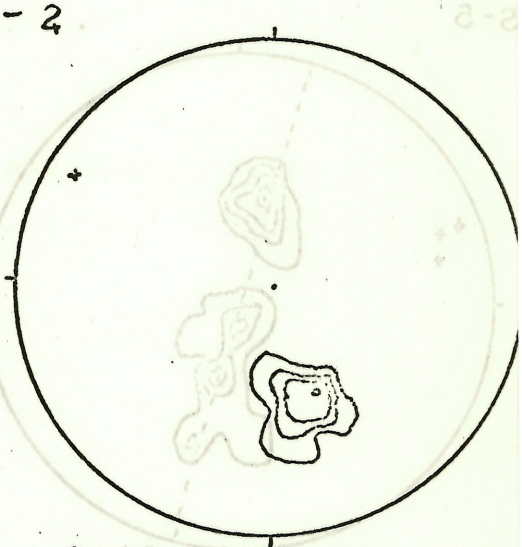
+ Joint 3

S - 1



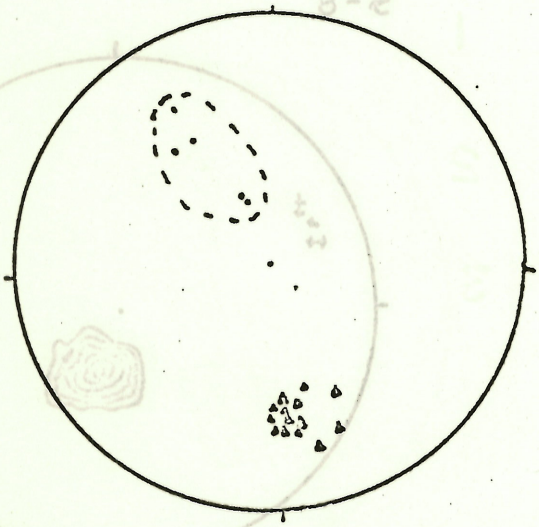
C-5, 10, 15, 20
P-19

S - 2



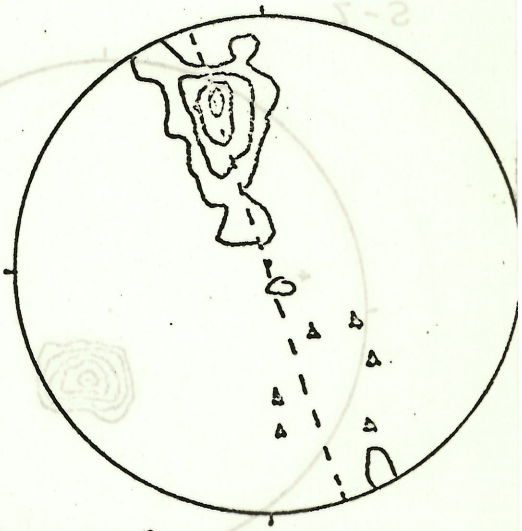
C-10, 20, 30, 40
P-14

S - 3



P-5

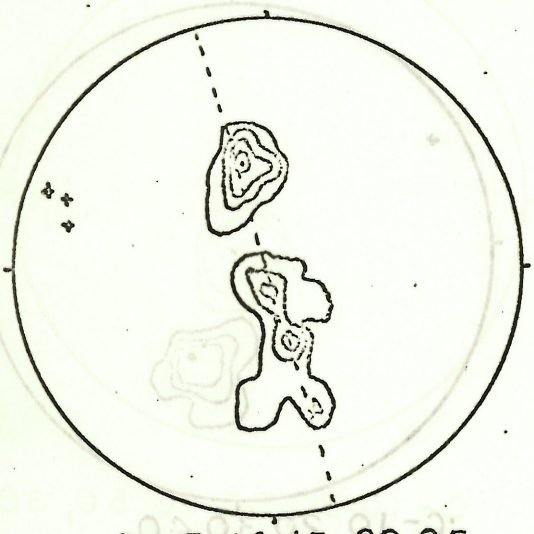
S-4



C-2, 10, 20, 30
P-46

Plate 2. (Continued)

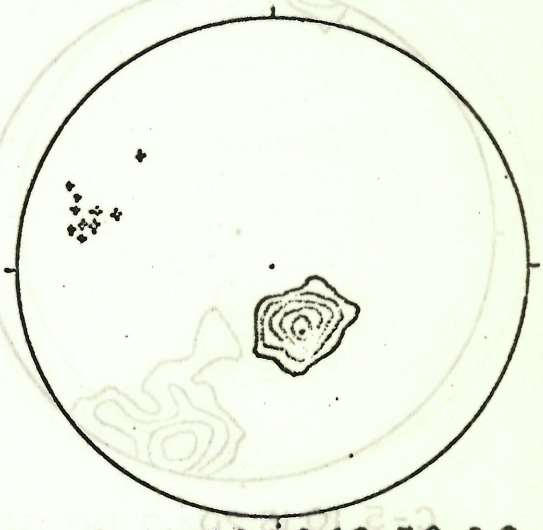
S-5



C - 5, 10, 15, 20, 25

P - 12

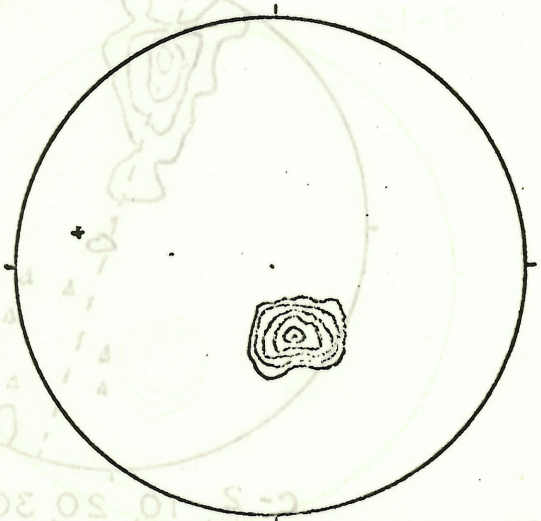
S - 6



C-10, 20, 30, 40, 50, 60

P-25

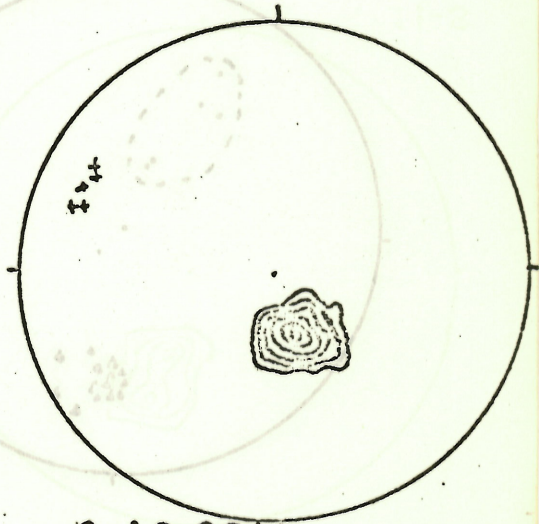
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C-10, 20, 30, 40, 50, 60

P-32

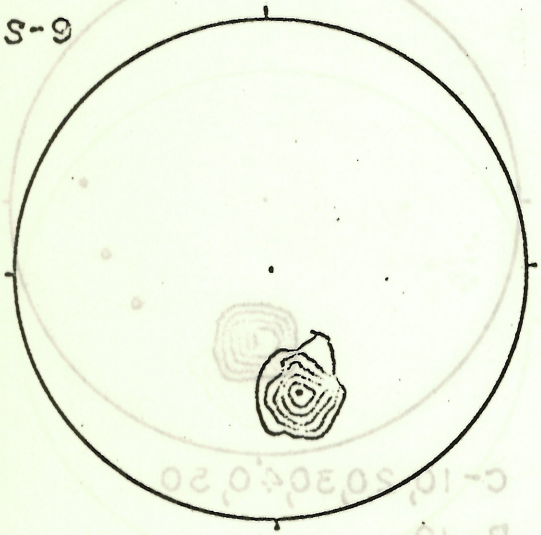
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C-10, 20, 30, 40, 50, 60

P-19

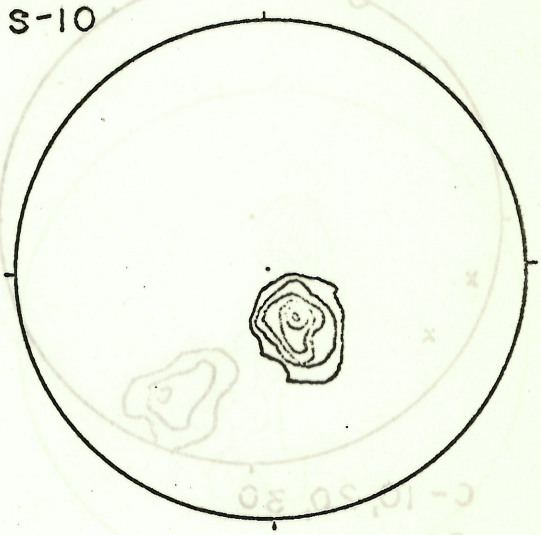
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C-10, 20, 30, 40, 50, 60

P-17

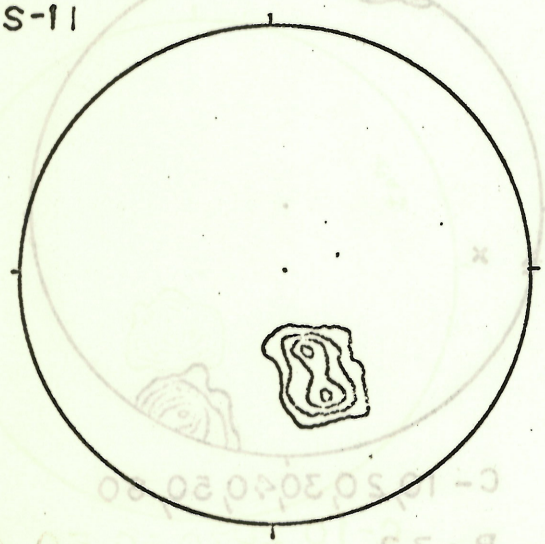
S-10



C-10, 20, 30, 40, 50, 60

P-20

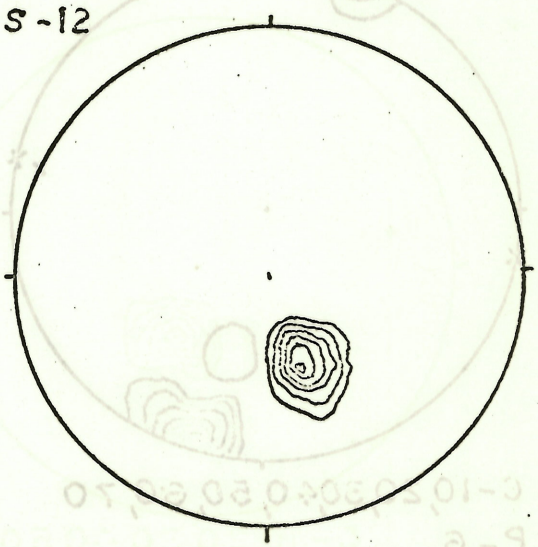
S-11



C-10, 20, 30, 40

P-20

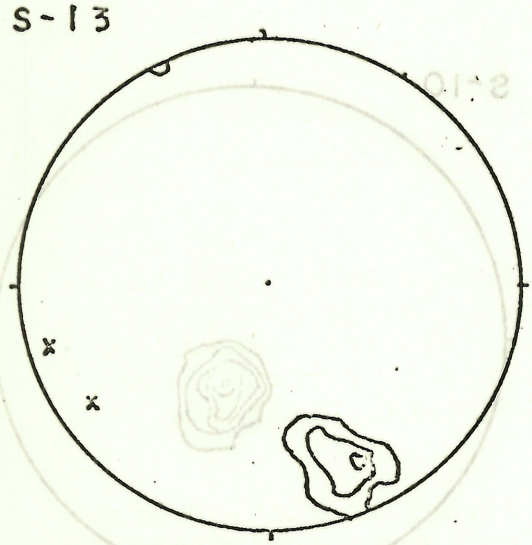
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C-10, 20, 30, 40, 50, 60

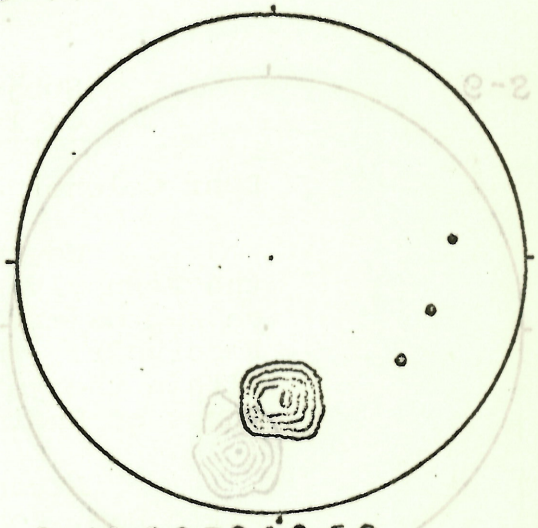
P-20

S-13



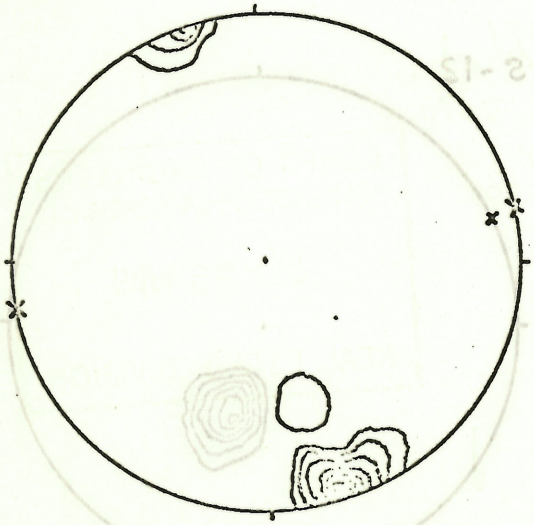
C-10, 20, 30
P-90

S-14



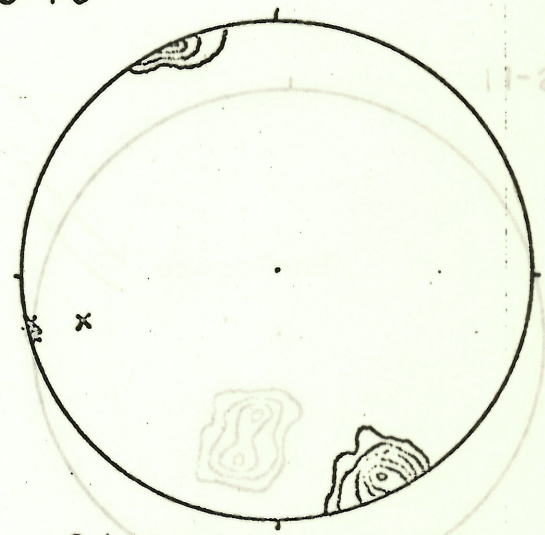
C-10, 20, 30, 40, 50
P-12

S-15



C-10, 20, 30, 40, 50, 60, 70
P-6

S-16



C-10, 20, 30, 40, 50, 60
P-32

Colonel James A. Johnson
District Engineer, Philadelphia District
U. S. Army Corps of Engineers
Second and Chestnut Streets
Philadelphia, Pennsylvania 19106

Subject: License for Wildlife Management on lands of the Beltzville Reservoir.

Dear Colonel Johnson:

We hereby request that a license be granted to the Pennsylvania Game Commission for wildlife management on approximately 397 acres of land within the Beltzville Reservoir. This impoundment is located in Carbon County, within the jurisdiction of the Philadelphia District, Corps of Engineers.

Attached is a copy of our Five-Year Plan, Beltzville Dam, Pohopoco Creek, Carbon County, Pennsylvania. This plan includes our proposed activity on lands to be licensed to the Game Commission. Tracts Nos. 515, 516, 520, and 521 will also be managed by the Game Commission by mutual agreement with the Department of Forest and Waters. The four parcels will be developed at a later time by the Department of Forest and Waters, depending upon the camping demand. Of course, parcels Nos. 515, 516, 520, and 521 will not be included in the license to the Game Commission.

We would appreciate an early response to our request.

Very truly yours,

Glenn L. Bowers
Executive Director

Enclosure

CORPS OF ENGINEERS
PHILADELPHIA DISTRICT
SEP 25 1969
REAL ESTATE DIVISION

Five-Year Plan - Beltzville Dam
Pohopoco Creek, Carbon County, Pennsylvania

The area assigned to the Pennsylvania Game Commission (approximately 397 acres) will be managed for small game and waterfowl. This area shall include tracts numbers 515, 516, 520, and 521 in addition to those previously agreed upon for Game Commission management. These above mentioned tracts eventually will be developed for park purposes by the Pennsylvania Department of Forests and Waters - Game Commission control to terminate when the land is required for that purpose as determined by park expansion needs.

Cropland Management

Cropland will be managed using approved agricultural and soil conserving practices conforming to a plan prepared jointly by the Pennsylvania Game Commission and the Carbon County Soil Conservation District. The plan provides that the Game Commission will maintain the soil pH at approximately 6.5 on all agricultural land.

Two tracts (Numbers 409, and 521) shall be leased by the Pennsylvania Game Commission to cooperating farmers (if available) who will farm on a share basis, the Commission retaining 1/4 share of all crops raised.

Share farmers will be required to follow approved land use practices, rotating grain crops with grasses and farming contour strips as laid out by the Soil Conservation Service or the Pennsylvania Game Commission. No share farming will be permitted in the potential flood zone between elevations of 628 and 651 feet.

Wildlife Management

The remaining tracts shall be managed by the Pennsylvania Game Commission mainly in grassland forage and shrub or shrub conifer cover for wildlife. Several areas close to the waterline on tracts numbers 407, 409, 501, and 503 will be managed for waterfowl in grass and small grain, both for green forage and for a seed crop for wildlife food.

All large agricultural fields including sharecrop areas will be subdivided for the enhancement of wildlife living conditions by the use of shrub, shrub - conifer or conifer cover strips. These strips, using approved, adaptable nursery seeding provided by the Pennsylvania Game Commission nursery, will be planted in varying widths according to terrain and optimum small game habitat requirements. Planting will be done by Pennsylvania Game Commission Land Management personnel.

In addition to planting in approved cover strips in agricultural areas several conifer plantings will be made on poor soil sites to improve winter cover conditions for wildlife (see attached map).

Sharecrop farmers shall be prohibited from harvesting early hay crops. Mowing of grasses and legumes shall be supervised or carried out by Game Commission personnel on all tracts. Generally, except on areas managed for goose pasture, cottontail rabbit food strips and roadside beautification, grassland mowing shall be delayed until July 15, to protect nesting wildlife.

Woodland

Woodland areas shall generally remain intact except for a 30-50 foot wide woodland border cutting at selected sites on tract numbers 408, 409, and 501, northwest of the legislative route which bisects tracts 409 and 501.

In addition, a minimum amount of release cutting will be done to favor desirable wildlife food producing trees and shrubs.

Buildings

In order to provide for overnite storage of Game Commission and/or share farmer agricultural equipment and supplies, several buildings on tract number 501 shall be retained, renovated and maintained by the Game Commission.

Public Hunting

Public hunting will be permitted on the entire area (as described in paragraph 1) for all species in season, but must be in compliance with existing state and federal laws or regulations.

Hunting shall be prohibited in any wildlife refuge or propagation area which may be established and properly marked.

Hunter Parking

Off road parking space will be necessary to accommodate hunters and wildlife or nature study enthusiasts seeking outdoor recreation. Parking areas are therefore proposed at indicated sites (see attached map) to be developed over a period of several years as determined by demand. Appropriate signs shall be erected to route users to proper parking locations.

Game Stocking

Several hundred Mallard ducks from the Pennsylvania Game Commission duck farms will be stocked the first year that the dam is in complete operation and for several years therafter. Twenty pairs of Canada geese will also be stocked at tract numbers 501 and 503, the first year that the dam is in operation. Success of this initial goose stocking will determine subsequent stockings.

Five-year Plan

Agricultural and wildlife development procedures as detailed in this plan will continue in force for a period of five years after receipt of a license from the United States Government, Army Corps of Engineers, without essential change or modification.

At the end of this five year period an evaluation will be made by the Division of Land Management to determine success, need for change and future procedure.

Enclosure:

1-Management Map
1-Share Farming Agreement Form

APPENDIX C

COST ESTIMATES

BELTZVILLE LAKE
TWINFLOWER AND TRINITY GORGE PUBLIC USE AREAS
ESTIMATE OF COST
INITIAL GOVERNMENT DEVELOPMENT
(PRICE LEVEL APRIL 1975)

1. TWINFLOWER

Item	Unit	Quantity	Unit Price	Total
Access Road (New)				
Grading	S.Y.	3,600	$ 2.00	$ 7,200
6" Base Course	C.Y.	1,100	15.00	16,500
2" Asphaltic Concrete	Ton	100	21.25	2,125
4" Painted Line	L.F.	2,000	0.25	500
Returfing	Acre	0.67	1,000.00	670
Access Road (Rehab)				
Grading	S.Y.	3,500	2.00	7,000
6" Base Course	C.Y.	1,300	15.00	19,500
Dble Bit Surf Treat	S.Y.	3,500	2.25	7,875
4" Painted Line	L.F.	2,700	0.25	675
Returfing	Acre	1.5	1,000.00	1,500
Subtotal - Access Roads				$ 63,545
Campground Roads				
Clearing & Grubbing	Acre	14.58	2,000.00	29,160
Grading	S.Y.	23,300	2.00	46,600
6" Base Course	C.Y.	4,000	15.00	60,000
Dble Bit Surf Treat	S.Y.	20,000	2.25	45,000
Returfing	Acre	7.0	1,000.00	7,000
Subtotal - Campground Road				$187,760
Boat Beach Sand	C.Y.	900	6.75	6,075
Buildings				
Wash House (Structure)	Each	6	47,400.00	284,400
Equipment - Mech & Plumb	Each	6	12,300.00	73,800
Electrical - Interior	L.S.	6	1,640.00	9,840
Subtotal				$368,040
Check-in Station (Structure)	Each	1	L.S.	18,000
Equipment - Mech & Plumb			L.S.	1,200
Electrical - Interior			L.S.	800
Subtotal				$ 20,000

Rev June 75

TWINFLOWER AREA (Cont'd)

Item	Unit	Quantity	Unit Price	Total
Water System				
3/4" Galvanized Steel Pipe	L.F.	65	$ 2.50	$ 160
1-1/4" Galvanized Steel Pipe	L.F.	5,440	3.00	16,320
2" Galvanized Steel Pipe	L.F.	1,000	3.35	3,350
3" C.I. Pipe	L.F.	715	7.00	5,005
4" C.I. Pipe	L.F.	5,000	9.00	45,000
6" C.I. Pipe	L.F.	5,400	12.00	64,800
Drinking Fountain	Each	31	325.00	10,075
Gate Valve (various sizes)	L.S.			2,800
Tap & Valve 36"x4"	Each	1	670.00	670
Meter & Meter Pit	Each	1	1,630.00	1,630
25,000 gal. Storage Tank (Elev.)	Each	1	L.S.	75,000
Water Pump Station	Job	1	L.S.	8,700
Atitude Valve & Valve Pit	Job	1	L.S.	6,200
Gate Valves & Piping	Job		L.S.	7,500
Misc. Mech & Elec Equipment	Job		L.S.	6,500
Subtotal Water System				$253,710
Sewage Disposal System				
Sewage Collection System				
6" C.I. Pipe	L.F.	2,400	14.00	33,600
6" V.C. Pipe	L.F.	7,000	10.00	70,000
Manholes	Each	40	900.00	36,000
Subtotal Sewage Collection System				$139,600
Mechanical and Electrical				
Raw Sewage Pumps	Each	6	2,650.00	15,900
Prefab Concrete Pumping Station	Each	3	17,700.00	53,100
Service Pole & Meter	Each	3	500.00	1,500
Wet Well	Each	3	10,000.00	30,000
Installation	Each	3	2,900.00	8,700
Subtotal, Mechanical & Electrical				$109,200

TWINFLOWER AREA (Cont'd)

Item	Unit	Quantity	Unit Price	Total
Force Main & Upgrade of Pine Run				
Package Sewage Treatment Plant	Job		$ L.S.	$ 54,100
Interior Electrical	Job		L.S.	500
Installation	Job		L.S.	50,000
Sand Filter	Job		L.S.	19,800
6" Force Main (PVC)	L.F.	24,000	12.00	288,000
Manholes	Each	20	900.00	18,000
Valves	Each	20	500.00	10,000
Subtotal, Force Main & Upgrade of Pine Run				440,400
Subtotal, Estimated Cost - Sewage Disposal				689,200
Electrical Distribution				43,375
Miscellaneous				
Flag Pole	L.S.			2,000
Picnic Tables	Each	230	100.00	23,000
Charcoal Grills	Each	230	85.00	19,550
Trash Receptacles	Each	230	92.00	21,160
Sanitary Trailer Station	L.S.			1,500
Barricade	L.S.			500
Chain Link Fence for Line Tower	L.F.	300	8.00	2,400
Subtotal Miscellaneous				70,110
Total				1,701,815
Contingencies - 12%				204,220
Grandtotal, Twinflower Area				1,906,035
		Rounded		$ 1,906,000

TRINITY GORGE AREA

Item	Unit	Quantity	Unit Price	Total
Water Supply and Distribution				
Well	L.S.		$	$ 11,250
Pump	L.S.			3,850
Electrical	L.S.			2,800
Pipe, 1-1/4" Galvanized Steel	L.F.	1,000	3.00	3,000
Drinking Fountain	Each	4	325.00	1,300
Gate Valve, 1-1/4"	Each	8	40.00	320
Well House (8' x 12' x 8' high)	L.S.			9,000
Subtotal, Water Supply and Distribution				31,520
Roads and Parking Area				
Clearing & Grubbing	Acre	1	2,000.00	2,000
Grading	S.Y.	11,700	2.00	23,400
Borrow	C.Y.	1,600	4.00	6,400
12" Riprap	Ton	1,000	18.00	18,000
6" Riprap Bedding	C.Y.	300	13.00	3,900
Double Bituminous Penetration Treatment	S.Y.	8,700	2.25	19,575
6" Base Course	C.Y.	800	15.00	12,000
60" Dia. Pipe Culvert (RCP)	L.F.	220	95.00	20,900
18" Dia. Pipe Culvert (RCP)	L.F.	110	16.00	1,760
Guard Rail	L.F.	800	5.00	4,000
Returfing	Acre	1	1,000.00	1,000
Subtotal, Roads and Parking				112,935
Miscellaneous				
Vault Latrine	Each	1		10,750
Picnic Tables	Each	100	100.00	10,000
Charcoal Grills	Each	25	85.00	2,125
Trash Receptacles	Each	25	92.00	2,300
Subtotal, Miscellaneous				25,175
Subtotal				169,630
Contingencies - 12%				20,370
Subtotal, Trinity Gorge Area - Initial Development				$190,000

APPENDIX D

LICENSE

D-1 Pennsylvania Game Commission, license for game management purposes.

D-2 Commonwealth of Pennsylvania lease for recreational facilities operations and maintenance by the Pennsylvania Bureau of State Parks.

GENERAL PLAN
FOR USE OF PROJECT LANDS AND WATERS
FOR WILDLIFE CONSERVATION & MANAGEMENT
BELTZVILLE RESERVOIR, PENNSYLVANIA

The Department of the Army, acting through the Corps of Engineers, under the authority of Public Law 87-874 has acquired certain lands in the Beltzville Reservoir for water supply, water quality, flood control, and recreation purposes; and the Secretary of the Army has determined that approximately 300 acres of the project lands as shown on exhibit A (2 sheets), attached hereto, are available for wildlife conservation and management purposes, consistent with the primary and collateral purposes of the project.

The Secretary of the Interior finds that the project land and water areas, shown on the exhibit attached hereto, would have value for the conservation of wildlife other than migratory birds and that the lands do not have value in carrying out the National Migratory Bird Management Program. Further, the Secretary of the Interior and the Executive Director of the Pennsylvania Game Commission find that it would be in the public interest for these lands to be managed for wildlife purposes by the Pennsylvania Game Commission.

THEREFORE, IN ACCORDANCE WITH THE PROVISIONS OF AND UNDER THE AUTHORITY OF THE FISH AND WILDLIFE COORDINATION ACT (48 STAT. 401, AS AMENDED: 16 U.S.C. 661 ET SEQ.), THE SECRETARY OF THE ARMY, THE SECRETARY

Encl 1

D-1a

OF THE INTERIOR AND THE EXECUTIVE DIRECTOR OF THE PENNSYLVANIA GAME COMMISSION DO HEREBY APPROVE THIS DOCUMENT AS A GENERAL PLAN AND AGREE THAT:

1. The land area amounting to approximately 300 acres and shown on exhibit A attached hereto and by this reference made a part hereof will be made available by the Secretary of the Army to the Game Commission of the State of Pennsylvania for administration for the conservation and management of migratory birds and of other wildlife.

2. Necessary details of agreement between the two agencies shall be mutually established and covered in an instrument (license) issued by the Department of the Army.

3. Further, in order to facilitate proper management and use of the project lands and waters, adjustments may be made in the boundaries of the areas shown on the attached exhibits by addition or deletion of tracts as may be mutually agreed upon by the Pennsylvania Game Commission and the Department of the Army, Philadelphia District, Corps of Engineers, without amendment to this General Plan. Such adjustments will be made by amendment of the aforementioned instrument.

IN WITNESS WHEREOF, the parties hereto have affixed their signature and date thereof on triplicate copies hereof, as follows:

Date March 17, 1970 — Executive Director, Pennsylvania Game Commission

Date 28 APR 1970 — Secretary of the Army

Date 6-18-70 — Secretary of the Interior

D-1c

DEPARTMENT OF THE ARMY LICENSE
FOR WILDLIFE MANAGEMENT PURPOSES IN THE
BELTZVILLE RESERVOIR PROJECT LICENSE NO. DACW61-3-71-18
CARBON COUNTY, PENNSYLVANIA

THE SECRETARY OF THE ARMY, under authority of Section 4 of the Act of Congress, approved 22 December 1944, as amended (76 Stat. 1195; 16 U.S.C. 460d) and Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq) hereby grants to the Commonwealth of Pennsylvania, Pennsylvania Game Commission, thereafter referred to as the licensee, a license for a period of twenty-five (25) years, commencing on 1 September 1970 and ending on 31 August 1995 to use and occupy approximately 622 acres of land and water areas under the primary jurisdiction of the Department of the Army in the Beltzville Reservoir Area, Carbon County, Pennsylvania, as shown in red on Exhibit "A" and Exhibit "B", attached hereto and made a part hereof, for game and wildlife management purposes.

THIS LICENSE is granted subject to the following conditions:

1. That the licensee, in the exercise of the privileges hereby granted, shall conform to such rules and regulations as may be prescribed by the Secretary of the Army to govern the public use of the said project area, and with the provisions of Section 4 of the Act of Congress approved 22 December 1944, as amended (76 Stat. 1195; 16 U.S.C. 460d).

2. That the licensee may construct upon said land such buildings, improvements, facilities, accommodations, fences, signs and other structures as may be necessary for the purposes of this license, and may plant seeds, shrubs and trees, provided that all such structures shall be constructed and the landscaping accomplished in accordance with plans approved by the District Engineer, U. S. Army Corps of Engineers, in charge of the administration of the property. No structures will be permitted below the 651' m.s.l. contour.

3. That the licensee shall administer and maintain the said property, for the purposes of this license, in accordance with the master plan for the said project area and with an annual management program to be mutually agreed upon between the licensee and the said District Engineer, which may be amended from time to time as may be necessary. Such annual management program shall include, but is not limited to, the following:

a. Plans for management and development activities to be undertaken by the licensee or jointly by the Corps of Engineers and the licensee.

b. Budget of the licensee for carrying out the management and development activities.

c. Personnel to be used in the management of the area.

d. Plans for supervising, patrolling and policing the licensed areas, including the water areas.

4. That the licensee shall protect the property from fire, vandalism and soil erosion, and may make and enforce such rules and regulations as are necessary, and within its legal authority, in exercising the privileges granted in this license, provided that such rules and regulations are not inconsistent with those prescribed by the Secretary of the Army to govern the public use of the area.

5. That the licensee, in exercising its governmental or proprietary functions, may plant and harvest crops, either directly or by service contract or under sharecrop agreements with local farmers to provide: (a) food for wildlife and (b) necessary compensation to farmers under any sharecrop agreement. Recognizing that a poor crop season may result in a lack of food for wildlife in a given future year, the licensee will be allowed to provide a reasonable surplus which will be held in reserve against a future poor crop season or may be disposed of by the State and the proceeds from the sale held in reserve against a future poor crop season. In any event, the lands will not be used by the State for the production of crops or any other purpose solely to produce revenue to defray costs of management of the wildlife area. Lands within the licensed area, available for lease for agricultural or grazing purposes, will be leased by the District Engineer. Monies collected by the State and not used to provide food for wildlife in a poor crop season shall be paid to the District Engineer at five-year intervals. The licensee will establish and maintain adequate records and accounts and render periodic statements of receipts and expenditures in furtherance of its wildlife feeding program, as may be required by said District Engineer. The District Engineer shall have the right to perform audits of the licensee's records and accounts.

6. That the licensee may take, trap, remove, stock or otherwise control all forms of wildlife within the said area, and may place therein such additional forms of wildlife as it may desire from time to time, and shall have the right to close the area, or any parts thereof from time to time, to fishing, hunting or trapping, provided that the closing of any area to such use for fishing, hunting or trapping shall be consistent with the state laws for the protection of fish and wildlife; also, the licensee shall enforce the game laws and such orders and regulations as may be issued by the Division of Game and Fish, and/or its Director, which laws, orders and regulations are consistent with its state-wide program.

7. That the licensee must coordinate with the District Engineer whenever the use of pesticides, herbicides or compounds containing pesticides or herbicides are contemplated.

8. That the water areas of the project shall be open to public use generally, without charge, for boating, swimming, bathing, fishing and other recreational purposes, and that ready access to and exit from such water areas along the shores of the project shall be maintained for general public use, when such use is determined by the Secretary of the Army not to be contrary to the public interest. However, no use of any area shall be permitted which is inconsistent with the state laws for the protection of fish and game.

9. That this license is subject to all existing and future easements, leases, licenses and permits heretofore granted, or to be hereafter granted, by the United States concerning said lands; provided, however, that upon appropriate notification by the licensee to said District Engineer, the United States, insofar as may be consistent with other uses and purposes of the project, will not enter into any new easements, leases, licenses or permits, or renewals thereof, which will, in the opinion of the District Engineer, adversely affect the current operations of the licensee under the provisions of the license, or which will conflict with the definitely scheduled program of the licensee for the expansion of its activities under the provisions of this license, and that of the approximately 422 acres designated for use, 100 acres more or less, as outlined in blue on Exhibit 'A' attached, will be available for development in the future to the Department of Forest and Waters for camp site development under its Public Park and Recreation responsibilities.

10. That the licensee shall not discriminate against any person or persons because of race, creed, color or national origin in the conduct of its operations hereunder.

11. That no cuts or fills along the shore line shall be made by the licensee without the prior approval of the said District Engineer.

12. That, within the limits of their respective legal powers, the parties to this license shall protect the project against pollution of its water, and the licensee shall operate within the frame work of the designated five-year plan as attached (Exhibit 'C').

13. That ingress to and egress from the project area shall be afforded the licensee over existing access roads, such interior roads as may be constructed, and at such additional places over Government-owned land as may be approved by said District Engineer. The licensee shall provide appropriate markings at its own expense.

14. That the right is hereby expressly reserved to the United States, its officers, agents and employees, to enter upon the said land and water

areas, at any time and for any purpose necessary or convenient in connection with river and harbor and flood control work, and to remove therefrom timber, or other material, required or necessary for such work; to flood said premises when necessary, and/or to make any other use of said land as may be necessary in connection with public navigation and flood control, and the licensee shall have no claim for damages of any character on account thereof against the United States or any agent, officer or employee thereof.

15. That any property of the United States damaged or destroyed by the licensee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the licensee to the satisfaction of the said District Engineer.

16. That the United States shall not be responsible for damages to property or injuries to persons which may arise from, or be incident to, the exercise of the privileges herein granted, or for damages to the property of the licensee, or for damages to the property or injuries to the person of the licensee's officers, agents, servants or employees, or others who may be on said premises at their invitation or the invitation of any one of them, arising from or incident to the flooding of said premises by the Government or flooding from any other cause, or arising from or incident to any other governmental activities on the said premises, and the licensee shall hold the United States harmless from any and all such claims.

17. That this license may be relinquished by the licensee at any time by giving to the Secretary of the Army, through the said District Engineer, at least thirty (30) days' notice in writing.

18. That this license may be revoked by the Secretary of the Army in the event the licensee violates any of the terms and conditions of this license and continues and persists therein for a period of thirty (30) days after notice thereof, in writing, by the said District Engineer.

19. That on or before the date of expiration of this license or its relinquishment by the licensee, the licensee shall vacate the said Government premises, remove all property of the licensee therefrom, and restore the premises to a condition satisfactory to the said District Engineer. If, however, this license is revoked, the licensee shall vacate the premises, remove said property therefrom, and restore the premises as aforesaid within such time as the Secretary of the Army may designate. In either event, if the licensee shall fail or neglect to remove said property and so restore the premises, then said property shall become the property of the United States, without compensation therefor, and no claim for damages against the United States, or its officers or agents, shall be created by or made on account thereof.

20. That the licensee shall so design and construct facilities to be provided on the land covered by the license so as to be in consonance with the principles of the National Environmental Policy Act of 1969 (83 Stat. 852).

IN WITNESS WHEREOF, I have hereunto set my hand by direction of the Assistant Secretary of the Army this 25 day of November, 1970.

SHERRY B. MYERS
Assistant for Real Property
OASA (I&L)

THE ABOVE INSTRUMENT, together with the provisions and conditions thereof, is hereby accepted this 30th day of March, 1970.

COMMONWEALTH OF PENNSYLVANIA, PENNSYLVANIA GAME COMMISSION

BY _____

TITLE Executive Director

BY _____

TITLE _____

D-1h

APPENDIX II

ASSURANCE OF COMPLIANCE WITH THE DEPARTMENT OF DEFENSE DIRECTIVE UNDER TITLE VI OF THE CIVIL RIGHTS ACT OF 1964

Commonwealth of Pennsylvania
Game Commission
(Name of Applicant-Recipient) (hereinafter called "Applicant-Recipient")

HEREBY AGREES THAT it will comply with Title VI of the Civil Rights Act of 1964 (P. L. 88-352) and all requirements imposed by or pursuant to the Directive of the Department of Defense (32 CFR Part 300, issued as Department of Defense Directive 5500.11, December 28, 1964) issued pursuant to that title, to the end that, in accordance with Title VI of that Act and the Directive, no person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Applicant-Recipient receives Federal financial assistance from the Corps of Engineers and

HEREBY GIVES ASSURANCE THAT it will immediately take any measures necessary to effectuate this agreement, Wildlife Management License No. DACW61-3-71-18.

If any real property or structure thereon is provided or improved with the aid of Federal financial assistance extended to the Applicant-Recipient by this Corps of Engineers, assurance shall obligate the Applicant-Recipient, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Applicant-Recipient for the period during which it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Applicant-Recipient for the period during which the Federal financial assistance is extended to it by the Corps of Engineers.

THIS ASSURANCE is given in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property, discounts or other Federal financial assistance extended after the date hereof to the Applicant-Recipient by the Department, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Applicant-Recipient recognizes and agrees that such Federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant-Recipient, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign this assurance on behalf of the Applicant-Recipient.

DATED _____

COMMONWEALTH OF PENNSYLVANIA GAME COMMISSION
(Applicant-Recipient)

P.O. Box 1567
Harrisburg, Pa. 17120
(Applicant-Recipient's Mailing Address)

BY _____
(President, Chairman of Board, or comparable authorized official)
Executive Director

D-1i

DEPARTMENT OF THE ARMY

LEASE NO. DACW61-1-72-124

FOR PUBLIC PARK AND RECREATIONAL PURPOSES

BELTZVILLE LAKE PROJECT AREA

THE SECRETARY OF THE ARMY under authority of Section 4 of the Act of Congress approved 22 December 1944, as amended (16 U.S.C. 460d), hereby grants to the Commonwealth of Pennsylvania Acting through the Department of Environmental Resources a lease for a period of twenty-five (25) years, years commencing on 1 June 1970, and ending on 30 May 1995, to use and occupy approximately 3,006.89 acres of land and water areas under the primary jurisdiction of the Department of the Army in the Beltzville Lake ~~Project~~ Area, hereinafter referred to as the premises as shown on attached Exhibit "A" in green & blue, numbered, dated, for public park and recreational purposes.

THIS LEASE is granted subject to the following conditions:

1. The lessee shall conform to such regulations as the Secretary of the Army may issue to govern the public use of the project area, and shall comply with the provisions of the above cited Act of Congress. The lessee shall protect the premises from fire, vandalism, and soil erosion, and may make and enforce such regulations as are necessary, and within its legal authority, in exercising the privileges granted in this lease, provided that such regulations are not inconsistent with those issued by the Secretary of the Army or with provisions of the above cited Act of Congress.

2. The lessee shall administer and maintain the premises in accordance with the U.S. Army Engineers' Master Plan and the implementing General Development Plan for the premises and with an Annual Management Program to be mutually agreed upon between the lessee and the U.S. Army District Engineer in charge of the administration of the project, which may be amended from time to time as may be necessary. Such Annual Management Program shall include, but is not limited to, the following:

a. Plans for management activities to be undertaken by the lessee or jointly by the U.S. Army Engineers and the lessee, including improvements and other facilities to be constructed thereon.

b. Budget of the lessee for carrying out the management activities.

c. Personnel to be used in the management of the area.

3. The lessee shall provide the facilities and services necessary to meet the public demand either directly or through concession agreements with third parties. All such agreements shall state that they are granted subject to the provisions of this lease and that the concession agreement will not be effective until approved by the District Engineer.

4. Admission, entrance or user fees may be charged by the lessee for the entrance to or use of the premises or any facilities constructed thereon, PROVIDED, prior written approval of the District Engineer is obtained.

5. The amount of any fees and all rates and prices charged by the lessee or its concessionaires for accommodations, [illegible] and services furnished or sold to the public shall be subject to the prior approval of the District Engineer. The lessee shall, by 15 April and 15 October of each year, submit to the District Engineer for approval a list of the fees, rates and prices proposed for the following 6 months, including justification for any proposed increase or decrease. The District Engineer will give written notice to the lessee of his approval of or objection to any proposed fee, rate or price and will, if appropriate, state an approved fee, rate or price for each item to which an objection has been made. The lessee and/or its concessionaires shall keep a schedule of such fees, rates or prices posted at all times in a conspicuous place on the leased premises.

6. All monies received by the lessee from operations conducted on the premises, including, but not limited to, entrance and admission fees and user fees and rental or other consideration received from its concessionaires, may be utilized by the lessee for the administration, maintenance, operation and development of the premises. Any such monies not so utilized, or programmed for utilization within a reasonable time, shall be paid to the District Engineer at the end of each 5-year period. The lessee shall establish and maintain adequate records and accounts and render annual statements of receipts and expenditures to the District Engineer, except for annual or weekly entrance fees which also are honored at other recreational areas operated by the lessee. The District Engineer shall have the right to perform audits of the lessee's records and accounts, and to require the lessee to audit the records and accounts of third party concessionaires, and furnish the District Engineer a copy of the results of such an audit.

7. All structures shall be constructed and landscaping accomplished in accordance with plans approved by the District Engineer. Further, the lessee shall not discharge waste or effluent from the premises in such a manner that such discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

8. The right is reserved to the United States, its officers, agents, and employees, to enter upon the premises at any time and for any purpose necessary or convenient in connection with river and harbor and flood control work, and to remove timber or other material required for such work, to flood the premises when necessary, and/or to make any other use of the land as may be necessary in connection with public navigation and flood control, and the lessee shall have no claim for damages of any character on account thereof against the United States or any agent, officer or employee thereof.

9. Any property of the United States damaged or destroyed by the lessee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the lessee to the satisfaction of the District Engineer.

10. The United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the lessee, or for damages to the property or injuries to the person of the lessee's officers, agents, servants, or employees or others who may be on the premises at their invitation or the invitation of any one of them, arising from or incident to the flooding of the premises by the Government or flooding from any other cause, or arising from or incident to any other governmental activities, and the lessee shall hold the United States harmless from any and all such claims.

11. That at the time of the commencement of this lease, the lessee will obtain from a reputable insurance company, acceptable to the Government, liability or indemnity insurance providing for minimum limits of $ per person in any one claim, and an aggregate limit of $ for any number of persons or claims arising from any one incident with respect to bodily injuries or death resulting therefrom, and $ for damage to property suffered or alleged to have been suffered by any person or persons resulting from the operations of the lessee under the terms of this lease.

DELETED

12. This lease may be relinquished by the lessee at any time by giving to the Secretary of the Army, through the District Engineer, at least 30 days' notice in writing.

13. This lease may be revoked by the Secretary of the Army in the event the lessee violates any of the terms and conditions of this lease and continues and persists therein for a period of 30 days after notice thereof in writing by the District Engineer.

14. On or before the date of expiration of this lease or its relinquishment by the lessee, the lessee shall vacate the premises, remove its property therefrom, and restore the premises to a condition satisfactory to the District Engineer. If, however, this lease is revoked, the lessee shall vacate the premises, remove its property therefrom, and restore the premises as aforesaid within such time as the Secretary of the Army may designate. In either event, if the lessee shall fail or neglect to remove its property and so restore the premises, then its property shall become the property of the United States without compensation therefor, and no claim for damages against the United States or its officers or agents shall be created by or made on account thereof.

15. The lessee or its concessionaires shall not discriminate against any person or persons because of race, creed, color or national origin in the conduct of its operations hereunder. The grantee furnishes as part of this contract an assurance (Exhibit "B") that he will comply with Title VI of the Civil Rights Act of 1964 (78 Stat. 241) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations.

16. All notices to be given pursuant to this lease shall be addressed, if to the lessee, to Commonwealth of Pennsylvania, Department of Environmental Resources, State Parks, Harrisburg, Pennsylvania
if to the Government, to the U. S. Army Engineer District, Philadelphia, Corps of Engineers, Custom House, 2d & Chestnut Streets, Philadelphia, Pennsylvania 19106, or as may from time to time be directed by the parties. Notice shall be deemed to have been duly given if and when inclosed in a properly sealed envelope or wrapper, addressed as aforesaid and deposited postage prepaid (or, if mailed by the Government, deposited under its franking privilege) in a post office or branch post office regularly maintained by the United States Government.

17. This lease is subject to all existing easements, and easements subsequently granted, for roadways, and utilities located or to be located on the premises, provided that the proposed grant of any easement will be coordinated with the lessee and easements will not be granted which will interfere with developments, present or proposed, by the lessee.

(Continued On Page 4)

IN WITNESS WHEREOF I have hereunto set my hand this 29th of November, 1971, by direction of the Assistant Secretary of the Army.

Sherry B. Myers
SHERRY B. MYERS
Assistant for Real Property
OASA (I&L)

The above instrument, together with the provisions and conditions thereof, is hereby accepted this 19 day of August, 1971

DEPARTMENT OF ENVIRONMENTAL RESOURCES
COMMONWEALTH OF PENNSYLVANIA

Approved 9/13/71
Robert Traul
Asst Attorney General

BY Maurice K. Goddard
MAURICE K. GODDARD, Acting Secretary

U.S. GOVERNMENT PRINTING OFFICE : 1967 OF—247-611

LEASE NO.

18. That this lease may be assigned by the lessee to the General State Authority of the Commonwealth of Pennsylvania with respect to any portion or portions of the leased property required by the General State Authority Session of the General Assembly of the Commonwealth of Pennsylvania, approved 31 March 1949, Public Law 372.

19. Any explanatory or directional signs erected by the lessee shall be approved by the said District Engineer before erection.

20. That the lessee shall exercise reasonable precautions to keep persons using or visiting the park and recreation area confined within the boundaries of the areas covered by this lease so as to avoid trespass on adjoining or adjacent property. Such precautions may include but are not limited to posting, fencing and patrolling as necessary.

Before the execution of this lease, Conditions 18 through 20 were added. Condition 11 was deleted.