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WOODWARD-CLYDE CONSULTANTS PLYMOUTH MEETING PA  
NATIONAL DAM INSPECTION PROGRAM. NEIFERT CREEK DAM (PA-00654). --ETC(U)  
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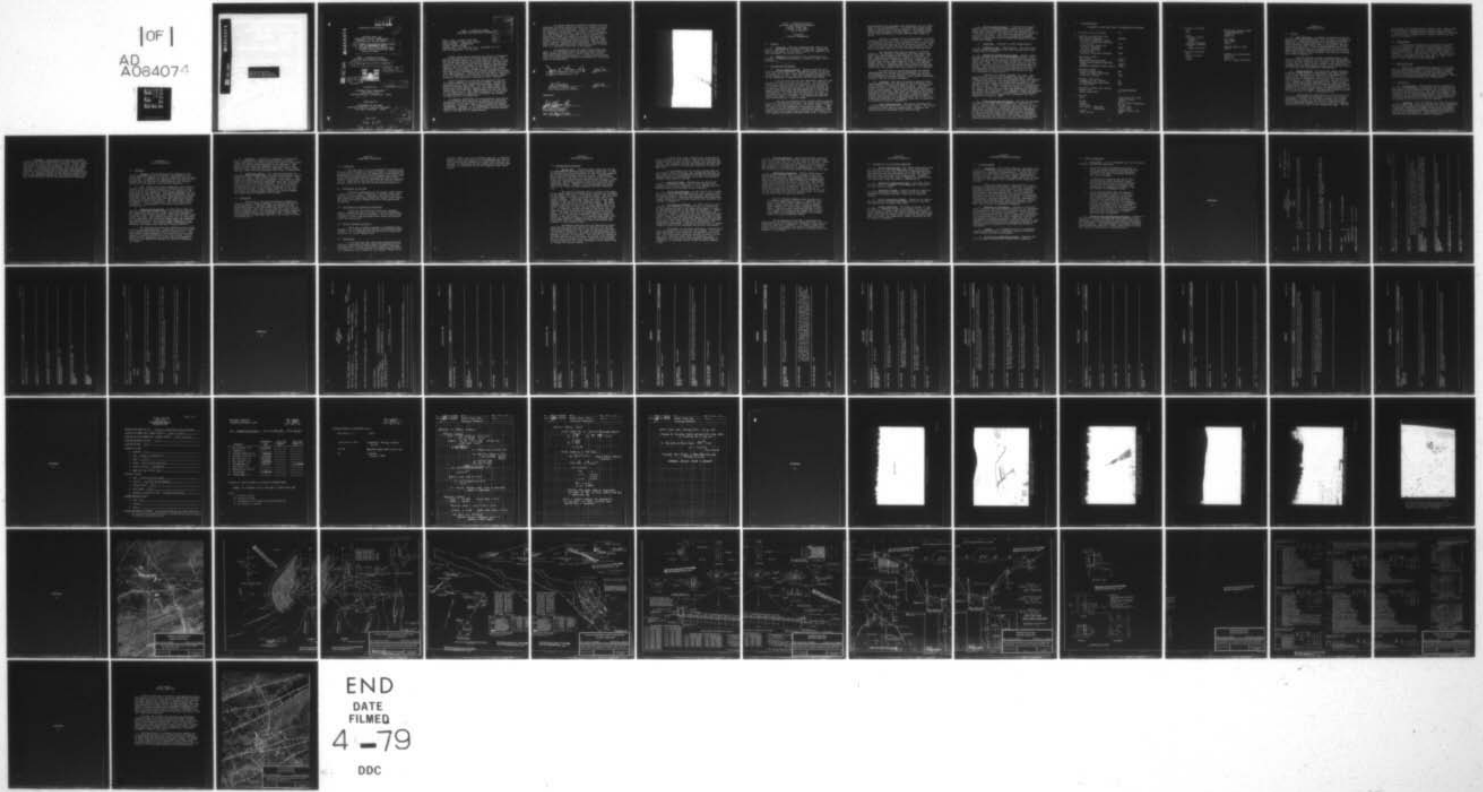
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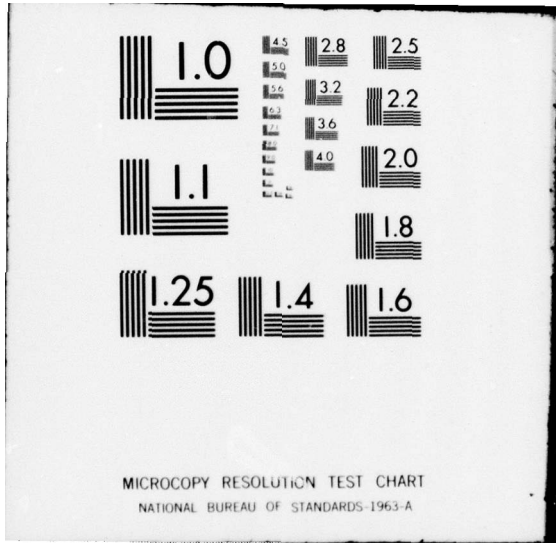
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SCHUYLKILL RIVER BASIN

①

NEIFERT CREEK DAM  
SCHUYLKILL COUNTY, PENNSYLVANIA  
NATIONAL I.D. NO. PA 00654

ADA064074

⑥ National Dam Inspection Program, Neifert  
Creek Dam ~~(ID Number (PA-00654))~~,  
Schuylkill River Basin, Neifert Creek,  
Schuylkill County, Pennsylvania, Phase  
I Inspection Report.

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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⑮ DAW 31-78-C-0048

⑪ Jun 78



⑫ 72 p.

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Prepared by:

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Submitted to:

DEPARTMENT OF THE ARMY  
Baltimore District, Corps of Engineers  
Baltimore, Maryland 21203

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PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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Name of Dam: Neifert Creek Dam  
 County Located: Schuylkill County  
 State Located: Pennsylvania  
 Stream: Neifert Creek  
 Coordinates: Latitude 40° 50.1' Longitude 76° 0.6'  
 Date of Inspection: 23 May 1978

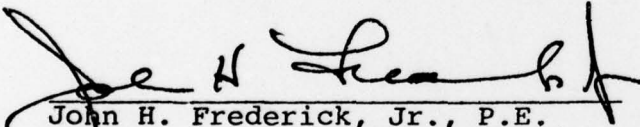
Neifert Creek Dam is owned by the County of Schuylkill and was designed by the Soil Conservation Service. The dam was designed solely as a flood retention system to control flows along Neifert Creek which drains into the Little Schuylkill River that flows through Tamaqua, Pennsylvania. Based on the visual inspection, available records and discussions with the Owner, the dam is judged to be in good condition. The spillway systems for this structure have been designed to accommodate the probable maximum flood (PMF) with some freeboard. Considering that the dam is classified as an "Intermediate" size dam with a "Significant" hazard potential, the spillway is considered quite "Adequate".

Visual inspection of the dam and reservoir area did not detect symptoms of uncontrolled seepage, instability, deterioration or other conditions that would suggest impending hazardous conditions. Only one small seep, with practically imperceptible seepage, was observed near the downstream toe of the dam, approximately 20 feet upstream of the impact basin. The visual inspection of the principal and emergency spillways did not reveal any evidence of deterioration or instability.

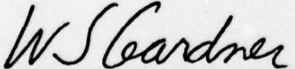
In summary, examination of the structures, and review of the available data revealed no evidence or conditions detrimental to the integrity of Neifert Creek Dam and its appurtenant structures. There are no additional studies recommended. However, it is recommended that the following measures be undertaken by the Owner during routine maintenance of the dam and its appurtenances.

All woody vegetation should be removed from the emergency spillway channel and side hill slopes to prevent deterioration of the spillway. Since the structure does not impound a significant head of water, desiccation of the embankment is possible. Therefore, it is recommended that the embankment be inspected at least annually for desiccation cracks and signs of uncontrolled seepage or stress during periods of high pool level. Should cracks develop, it is recommended that any crack areas be scarified, regraded, compacted and revegetated. The structure should also be inspected after each severe storm to determine if a hazardous condition is developing.

In conjunction with the annual maintenance program, it is recommended that the Owner develop a maintenance inspection checklist to insure that all critical items are inspected periodically. A formal warning system and surveillance program should be developed for use in the event of an emergency.

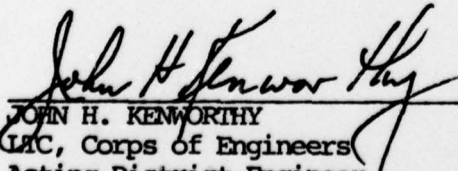
  
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John H. Frederick, Jr., P.E.  
Maryland Registration 7301

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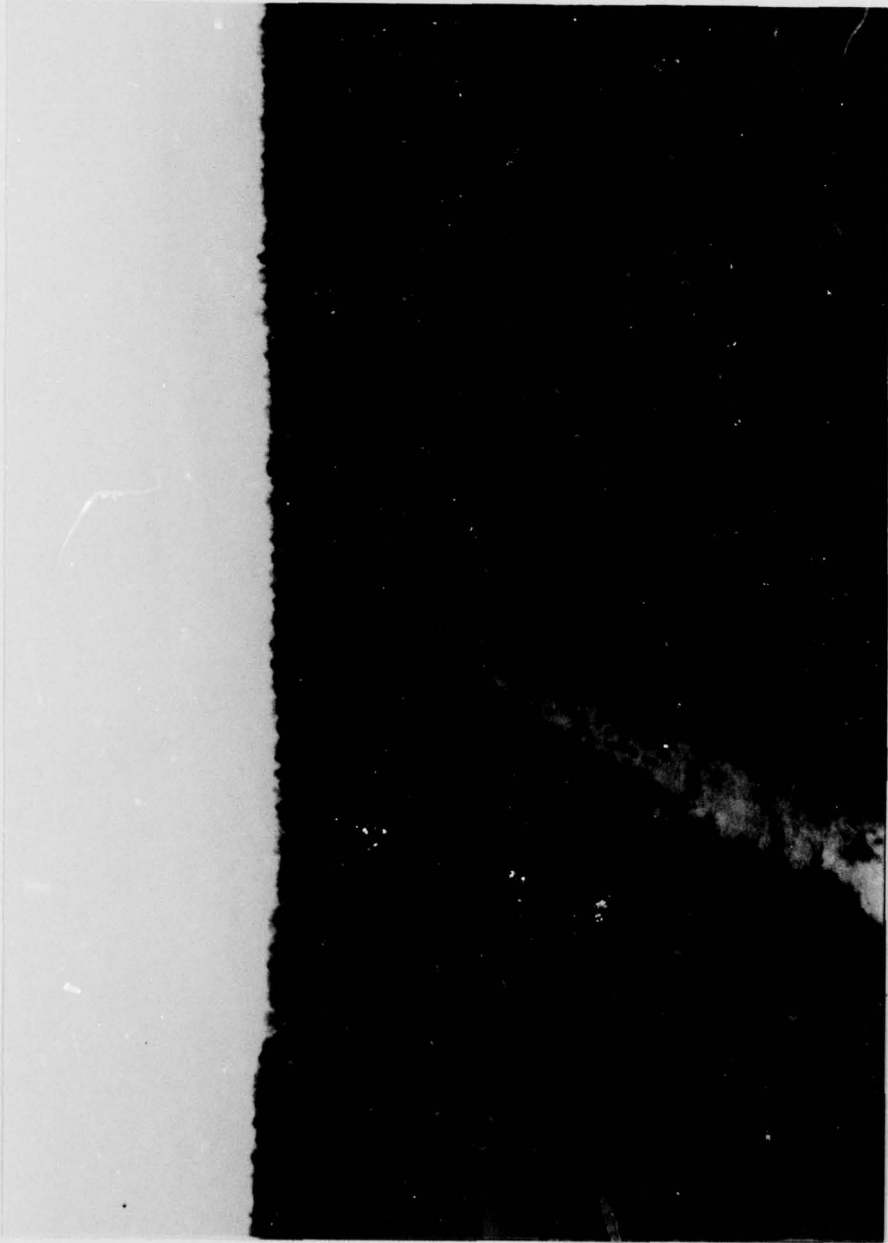
  
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William S. Gardner, P.E.  
Penna Registration 004302E

8/2/78  
Date

APPROVED BY:

  
\_\_\_\_\_  
JOHN H. KENWORTHY  
LAC, Corps of Engineers  
Acting District Engineer

DATE: 23 August 1978



OVERVIEW  
NEIFERT CREEK DAM, SCHUYLKILL COUNTY, PENNSYLVANIA

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM  
NEIFERT CREEK DAM  
NATIONAL ID #PA 00654  
DER ID #54-173

SECTION 1  
PROJECT INFORMATION

1.1 General.

a. Authority. The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspection of dams throughout the United States.

~~b. Purpose.~~ → The purpose of the inspection is to determine if the dam constitutes a hazard to human life or property.

1.2 Description of Project.

a. Dam and Appurtenances. Neifert Creek Dam is a zoned earth fill structure. The maximum height of the dam is 55 feet and it has a crest length across the valley of approximately 645 feet. The total estimated volume of fill in the embankment is approximately 97,200 cubic yards.

Records indicate that the embankment materials are composed of silty clay and gravelly clay. An inclined exterior slope and toe drain is provided at the downstream toe between Stations 4+20 and 7+80. The rock extends up to elevation 1088.0 and has been installed to relieve the seepage pressure through the embankment and in the weathered bedrock. The crest width of the dam is 18 feet. In accordance with the available SCS drawings, the upstream constructed slope is 2.91H:1V. The downstream slope has been constructed on a 1.94H:1V slope.

The dam was designed with a cutoff trench oriented along the centerline of the dam. The trench was designed to have a 20-foot base width and rise on 2H:1V slopes. A typical section of the embankment is enclosed as Plate 3. The principal spillway consists of a reinforced concrete single stage riser with a weir crest elevation of 1086.0 and a 30-inch diameter reinforced concrete outlet pipe. The pipe is



buried beneath the embankment and discharges into an impact basin at the downstream toe. A 20-foot long riprap lined channel conveys water from the basin to an unlined channel which joins the natural stream channel. The bottom width of the riprap channel is 12 feet and has side slopes of 2H:1V.

Reservoir drawdown can be accomplished by a 24-in. diameter pipe with an invert at elevation 1071.5. The pipe is located at the base of the principal intake structure and can be opened from the top of the principal spillway. The invert is located about 50 feet into the reservoir and the pipe discharges into the 30-inch principal spillway pipe.

The emergency spillway is located in the left abutment. The channel is excavated into the natural bed-rock. The bottom width of the channel is 130 feet. The side slopes were excavated on a slope of 0.25H:1V into the weathered rock. Above the rock line, excavation is in natural soil and has side slopes of 3H:1V. The approach channel floor is horizontal and has a length of approximately 250 feet. Beyond Station 3+88.6 along the spillway centerline, the channel floor has a grade of +2.5 percent.

An earth dike is constructed along the inside slope between the channel and the embankment to protect the downstream toe of the earth dam in the event of flow in the emergency spillway channel. This channel discharges directly into the natural streambed.

b. Location. The dam is located on Neifert Creek approximately 2,000 feet upstream of the confluence of the Little Schuylkill Creek with Neifert Creek. The dam and reservoir site is located in Rush Township, Schuylkill County, Pennsylvania. Neifert Creek was built concurrently with Little Schuylkill Dam, which is located on the Little Schuylkill River, about 800 feet east of Neifert Creek Dam. The dam site and reservoir are shown on USGS Quadrangle Delano, Pennsylvania, at coordinates N40° 50.1', W76° 0.6'. A Regional Location Plan of Neifert Creek Dam and Reservoir is enclosed as Plate 1, Appendix E.

c. Size Classification. The dam is classified as "Intermediate" by virtue of its 55 feet height. The current storage at normal pool is insignificant. However, the flood storage is estimated to be 545 acre-feet.

d. Hazard Classification. A "Significant" hazard classification is assigned because there are no inhabitable structures downstream that would be affected by a flood wave produced by the failure of the dam while storing a full pool of water. The flood wave produced at peak storage in the event of failure is judged to dissipate before it reaches the town of Tamaqua and would not cause significant damage.

e. Ownership. Schuylkill County Commissioners.

f. Purpose of Dam. Flood control. The small pond located behind the structure has been stocked and is currently used for fishing.

g. Design and Construction History. Neifert Creek Dam was designed by the Soil Conservation Service. Associated with this design, the Soil Conservation Service produced a 15-sheet set of drawings (Drawing No. PA-422A-P), dated April 1966. The Soil Conservation Service also prepared the specifications for these drawings which were reviewed. This dam was constructed under the provisions of the Watershed Protection and Flood Prevention Act, with the assistance of the Soil Conservation Service of the U.S. Department of Agriculture.

Construction started September 19, 1966. The Contractor for this work was Schwartz and Baker, Clarks Summit, Pennsylvania. Work was terminated during the winters of 1966-67 and 1967-68, and resumed again on May 15, 1968. The dam and appurtenant structures were essentially completed on June 7, 1968 and inspected by the Soil Conservation Service on June 7, 1968. During the course of construction, Mr. John W. Mickley was the appointed Resident SCS Engineer to oversee the construction. Mr. Eugene H. LaBar was appointed the on-site SCS inspector. The Department of Environmental Resources, Harrisburg, Pennsylvania, performed the final inspection on June 11, 1968.

h. Normal Operating Procedures. The dam was designed to impound a 5.5 acre pool at normal pool elevation of 1086.0. Excess water is discharged over a weir at the principal intake structure. Beyond the spillway capacity, excess water is temporarily impounded behind the embankment. Should low frequency storms occur which cannot be handled by the principal spillway, the excess water is impounded to elevation 1113.6; thereafter, flood water is discharged over the emergency spillway and into the downstream channel immediately below the principal spillway exit structure.

1. Pertinent Data.

A summary of pertinent data is tabulated as follows:

|  |  |
|--|--|
| a. Drainage Area (sq. miles)   | 3.1                                    |
| b. Discharge at Dam Site (cfs)   |  |
| Max. Known Discharge   | unknown                                |
| Discharge w/reservoir level<br>@ crest of emergency spillway<br>(El. 1113.6) | 133                                    |
| At Design High Water (El.<br>1119.4), emergency<br>spillway discharge        | 4600                                   |
| At Top of Dam,<br>Emergency Spillway Discharge                               | 9400                                   |
| c. Elevations (feet)   |  |
| Top of Dam   | 1121.5                                 |
| Emergency Spillway Crest   | 1113.6                                 |
| Normal Pool/Principal Spillway<br>Crest                                      | 1086.0                                 |
| Emergency Drawdown Intake Invert   | 1071.5                                 |
| d. Reservoir (feet)  |  |
| Length @ Normal Pool   | 800                                    |
| Length at Design High Water<br>Pool (El. 1119.4)                             | 4600                                   |
| e. Storage (acre feet)   |  |
| Sediment (to El. 1086.0)   | 36                                     |
| To Emergency Spillway Crest  | 581                                    |
| To Top of Dam  | 937                                    |
| f. Reservoir Surface Area (Acres)  |  |
| Normal Pool  | 6 (approximately)                      |
| Design High Water  | 51                                     |
| g. Dam Data  |  |
| Type   | Zoned earth fill with<br>rock fill toe |
| Length   | 645 ft.                                |
| Height   | 54 ft. (from foundation)               |
| Top Width  | 18 feet                                |
| Side Slope - Upstream  | 2.91:1 (H:V)                           |
| - Downstream   | 1.94:1 (H:V)                           |
| Cutoff   | Trench to rock line                    |
| Grout Curtain  | None                                   |



- h. Principal Spillway
- |                    |                                 |
|--------------------|---------------------------------|
| Type               | Reinforced Concrete Riser       |
| Size               | Inside Dimensions:<br>2'6"x7'6" |
| Crest              | 1086.0 ft.                      |
| Discharge Conduit  |                                 |
| Diameter           | 30 inches                       |
| Length             | 271.4 feet                      |
| Outlet Elevation   | 1063.0                          |
| Emergency Drawdown |                                 |
| Size               | 24-inch pipe to riser           |
| Intake Elevation   | 1071.5                          |
- i. Emergency Spillway
- |                 |                          |
|-----------------|--------------------------|
| Type            | Channel cut through Rock |
| Crest Elevation | 1113.6 ft.               |
| Width           | 130.0 ft.                |
| Length          | 400 ft. along centerline |

SECTION 2  
ENGINEERING DATA

2.1 Design.

a. Data Available. A summary of engineering data on Neifert Creek Dam is presented in the Checklist, attached as Appendix A. Engineering design data available for Neifert Creek Dam was contained primarily in the 15-sheet set of design drawings, dated April 1966, as prepared by the Soil Conservation Service. A set of these drawings is in the Owner's possession and at the Commonwealth of Pennsylvania, Department of Environmental Resources main office in Harrisburg, Pennsylvania. Other documents available and reviewed are listed in Appendix A.

The SCS archives located in Mechanicsburg, Pennsylvania contain complete files on the design and construction of the dam including the following: Soil Mechanics and Geology reports, design folder, drawings and construction documentation including daily records, field testing results for both concrete and embankment construction.

b. Design Features. The principal design features of Neifert Creek Dam are illustrated on the plans and profiles of the embankment and appurtenant structures, enclosed herein as Appendix E, Plates 2 through 6. All of these plates are reproduced from the Soil Conservation Service drawings. As shown on the drawings, the dam is basically a homogeneous earth embankment with a small coarser zoned section downstream and a downstream inclined drainage blanket which is keyed into rock. The drawings show the embankment to have a maximum height of approximately 55 feet with an 18 foot wide crest. The upstream constructed slope is 2.91H:1V with a 1.94H:1V downstream slope.

Underseepage is controlled by a 20 foot wide cut-off trench excavated approximately 10 feet into the rock foundation. Although it is highly unlikely that seepage would develop through the dam during a flood retention period, embankment seepage can be controlled by a combined inclined and a toe drain on the downstream slope. The up-

stream slope is riprapped below elevation 1087. Above 1087, the embankment is grass-covered. Typical cross-sections of the principal spillway and emergency spillway are enclosed as Plates 4 and 5, respectively. Further details are presented in Section 1.2.

## 2.2 Construction.

a. Construction documentation contained in the DER files was limited to a series of miscellaneous letters, notes and memoranda. SCS files contain complete construction documentation. Clearing of the site was started September 19, 1966. Work was shut down for the winter on December 7, 1966 and resumed June 5, 1967. Work was again shut down on December 27, 1967 until May 15, 1968. By June 7, 1968, construction was complete.

## 2.3 Operation Data.

Since this impoundment was designed as a single purpose flood control system, normal storage is insignificant behind the embankment. No reservoir water surface elevation records are maintained nor are there any staff gages or other types of recording equipment evident. There are also no minimum downstream flow requirements.

## 2.4 Evaluation.

a. Availability. Data reproduced and evaluated in this report was provided, principally, by the Pennsylvania Department of Environmental Resources and, secondarily, by the Soil Conservation Service. The DER files indicate that a complete set of design computations were forwarded to the Department of Environmental Regulations. The complete set of design computations, including Soil Mechanics and Geology reports, are on file in the SCS archives.

b. Adequacy. Since the design data and construction data located in DER files was limited, the final assessments of this investigation were based primarily on the visual inspection, construction reports by the County representatives and the hydrologic/hydraulic analyses performed as part of this investigation. Subsequently, SCS files were reviewed and confirmed the original assessments.

c. Validity. Design drawings showed the proposed borrow source for the embankment to be located west of the dam and on the north side of the reservoir. Visual inspection tends to confirm this location. Based on the visual inspection, construction photographs (six) and the design drawings, it is believed that the dam and appurtenances were most likely constructed in accordance with specifications. The exposed features of the structure noted during the visual inspection agree with the design drawings, further confirming that the dam was constructed as designed.



SECTION 3  
VISUAL INSPECTION

3.1 Findings.

a. General. The observations and comments of the field inspection team are contained in the Checklist enclosed herein as Appendix B, and are summarized and evaluated as follows. In general, the appearance of the facility indicated that the dam and its appurtenances were properly constructed and observed to be in good condition.

b. Dam. During the visual inspection, there were no indications or evidences observed of distortions in alignment or grade that would be indicative of movement of the embankment or the foundation. All slopes appeared to be in good condition and the crest, although unprotected, was also evaluated to be in good condition. Some erosion was noted along the crest and along the upstream slope which can be attributed to motor bike traffic. One small seep, located as shown on Plate 2 of Appendix E, was noted during this inspection. A photograph of this seep is enclosed herein as Photo No. 6.

c. Appurtenant Structures. At the time of this inspection, water was flowing through the principal spillway. The exposed portions of the intake riser were inspected and found to be in good condition. There was no trash noted around the riser. The conduit extending into the dam could not be inspected, but the outlet impact basin was inspected. The exposed portions of this basin were observed to be in excellent condition. The riprap channel immediately downstream of the impact basin was also in good condition.

The emergency spillway was inspected and observed to be in very good condition. There was no spalling, cracking or distortions observed along the concrete sill. The side channel slopes appeared to be stable with only slight amounts of vegetation growing in the rock joints. The approach channel appeared to be stable and well-vegetated. Similarly, the downstream channel was also well-vegetated and stable.

d. Reservoir. Although the reservoir is relatively small, there was no evidence of significant siltation, slope instability, or other features that would significantly effect the flood storage capacity of the reservoir. The natural ground above the permanent pool elevation to the emergency pool elevation was also inspected. These slopes appeared stable and well-vegetated with trees or dense grass.

e. Downstream Channel. The downstream channel was inspected from the impact basin to the confluence with Little Schuylkill Creek. This channel appears to be stable. Side slopes are moderate and well vegetated. There were no inhabitable structures observed downstream along the flood plain zone until the creek reaches Tamaqua. The town of Tamaqua is approximately 4.8 miles downstream and the flood wave produced by dam failure would have dissipated by the time it reached the town. State Highway Route 54 is the only road along the stream channel between the dam and Tamaqua and damage would be expected to be minimal.

### 3.2 Evaluation.

The survey of the dam disclosed no evidence of apparent, past or present movement to indicate instability of the embankment. One minor seep was observed on the downstream slope of the dam immediately above the stilling basin structure. The rate of flow from this seep is practically imperceivable. All appurtenant structures inspected, which included the principal spillway riser, impact basin and emergency spillway were observed to be in good to excellent condition.

SECTION 4  
OPERATIONAL PROCEDURES

4.1 Procedures.

The reservoir level is regulated by discharge over the concrete riser weir at elevation 1086.0. During periods of high runoff, flood water is temporarily stored behind the embankment and allowed to discharge through the outlet riser. If the flood storage capacity is exceeded, excess water would be discharged over the emergency spillway at elevation 1113.6. There are no operational records available noting maximum elevations of the pool during extreme rainfalls.

4.2 Maintenace of the Dam.

The dam is maintained by the County, which issues a contract with a local contractor to perform yearly maintenance on the structure. Typically, this work involves the cleaning of trash racks around the intake riser, mowing the grass, and general rehabilitation of the appurtenant facilities.

4.3 Maintenance of Operating Facilities.

Since the operating facilities are extremely simple, maintenance work is limited to yearly inspections and the cleaning of these structures. At the time of this inspection, all of the structures were clean and appeared to be well maintained.

4.4 Warning Systems in Effect.

There are no warning systems or procedures established to be followed during periods of exceedingly heavy rainfall. It is reported that the structure is monitored by the Civil (local) Defense Unit.

4.5 Evaluation.

It is believed that the current operating procedures are reasonably realistic means of operating the relatively simple control facilities at Neifert Creek Dam. Furthermore, it is believed that the maintenance procedure is a reasonable one to maintain this system. There is no



resident tender, nor is it believed that one is required. However, after high flows, it is recommended that the intake structures be inspected to insure that they are not clogged. An evaluation of the access road indicates that the road is accessible during low frequency high runoff storms.

SECTION 5  
HYDROLOGY/HYDRUALICS

5.1 Evaluation of Features.

a. Design Data. Available design data was limited to statements in the Application Report, dated June 2, 1966, and preliminary design statements in the work plan prepared by the Soil Conservation Service in 1958. Supplemental data located in the DER files included a letter of transmittal for the construction plans and flood routings. These files also contained a design folder which included specifications, design computations, geologic report and soils laboratory report. However, only the construction plans were in the files and made available for this investigation.

The original drainage area is listed in the Application Report and on the construction drawings and confirmed by the latest USGS maps is 3.09 square miles. The watershed is leaf-shaped, 3.1 miles long and 2.0 miles wide at its widest location. Elevations range from 1940 in the upper regions to 1086 at the normal reservoir level. The upper reaches of the reservoir are steep and wooded. The valley gradient flattens out such that a large, approximately 30 acres, marshy area is about one mile upstream of the reservoir. A temporary storage afforded by the marsh area is expected to have no significant effect during an extreme event. The whole watershed is approximately 50 percent wooded, 10 to 15 percent residential with some growth expected in the near future. It is possible that some strip mining may eventually commence within the watershed area which would tend to increase the runoff and produce more sediment in the reservoir area.

Information obtained from the Application Report indicated the hydrologic/hydraulic design of the dam was based on procedures outlined in the SCS National Engineering Handbook, Section 4. The crest of the principal riser was set at an elevation to provide an estimated 50 years of sediment storage, 36 acre-feet. The crest of the emergency spillway was set at an elevation to provide flood storage for at least a 100-year, six hour storm with an antecedent moisture condition III, which represents a high runoff from an already wet ground surface.

A design high water elevation was determined by routing runoff of 10.31 inches. The crest of the dam was set by routing a runoff of 19.41 inches, the estimated PMF runoff. The discharge through the emergency spillway when the reservoir level is at the top of the dam is given as 9400 cfs.

In accordance with the criteria established by the Federal (OCE) Guidelines, the recommended spillway design flood for this Intermediate Size dam and Significant Hazard Potential classification is one-half the probable maximum flood (PMF) to the PMF.

b. Experience Data. Records are not maintained either of discharge through the spillway systems or of reservoir water level elevations. It is unknown what the maximum water level has been in the reservoir.

c. Visual Observations. At the time of this inspection, no conditions were observed that would indicate that the outlet capacity would be significantly reduced during a flood occurrence. Observations regarding the downstream channel condition and spillway condition and reservoir are located in Appendix B.

d. Overtopping Potential. As flood routing, calculations, etc., were not in the DER files, an evaluation of the statements made in the Application Report is made by approximate methods as contained in Appendix C. Sheets 4 and 5 of Appendix C indicate that the discharges are reasonable. Sheet 6 indicates that the estimated PMF peak inflow, based on information supplied by the Corps of Engineers, is less than the discharge capacity of the spillway. It is to be noted that design inflow hydrographs developed according to SCS criteria tend to be conservative for these small watersheds. Therefore, the structure is judged capable of passing the estimated PMF without overtopping.

Subsequent to the above evaluation, the SCS files were retrieved from the archives and reviewed. The free-board hydrograph peak inflow was calculated to be 10,119 cfs. The routed storm produced the peak outflow of 9,400 cfs with a reservoir water level of elevation 1121.5. Therefore, the original spillway adequacy assessment of "Adequate" is confirmed by the review of design computations.

e. Spillway Adequacy. The estimated peak inflow of 5190 cfs is less than the combined riser and spillway capacity of more than 9400 cfs (at the crest of the dam). Therefore, the spillway passes 100 percent of the PMF leaving some freeboard. The spillway is classified as "Adequate". The tailwater is estimated to be approximately 23 feet or more below the top of the dam during the passing of the PMF.

f. Downstream Conditions. Neifert Creek Dam is a flood control structure built in conjunction with the Little Schuylkill Dam. The drainage area controlled by the Little Schuylkill is approximately 15.6 square miles. Neifert Creek joins the Little Schuylkill approximately 2,500 feet downstream of Neifert Creek Dam. The channel passes through a 400 foot wide, wooded flood plain. Approximately 3,000 feet downstream of the dam is the Central New Jersey Railroad tressel. The potential for downstream damage was analyzed in 1958 by the SCS as part of the watershed work plan for Neifert Creek. A section of this work plan is quoted as follows:

"Severe flooding damage occurs periodically at Tamaqua (population 12,000), at Reynolds, location of the Atlas Powder Company, and on several other reaches along the river. Flooding damages start between a 5- and 10-year frequency of occurrence. The high stream gradient produces velocities capable of causing great damage even at bank-full stages to the Reading Railroad's main branch along the Little Schuylkill River".

During passing of the PMF, a difference of approximately 25 feet between the reservoir water level and tailwater elevation is expected. If Neifert Creek fails during the PMF, the hazard for loss of life would be expected to be insignificant and damage to property would be expected to be minimal.



SECTION 6  
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability.

a. Visual Observations. The visual observations did not indicate any existing embankment stability problems. Only one small spring with practically imperceptible flow was observed near the downstream toe of the dam, approximately 20 feet upstream of the impact basin. However, with the low pool at the time of inspection, observations for structural integrity were of limited value.

b. Design and Construction Data. Available design data was listed in Appendix A and described in Section 2 of this report as noted.

c. Operating Records. Since the dam and reservoir have been designed to operate without valves or other mechanically operated devices, there are no operation records.

d. Post-Construction Changes. There are no reports nor is there any evidence that modifications of the dam and appurtenant structures were made.

e. Seismic Stability. This dam is located in Seismic Zone I. Normally it can be considered that if a dam in this zone is stable under static loading conditions, it can be assumed safe for any expected earthquake conditions. Since there were no formal static stability analyses available for review, the theoretical seismic stability of the dam cannot be assessed.

SECTION 7  
ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment.

a. Assessment. The visual inspection and design use of Neifert Creek Dam indicates that the dam embankment and foundation is performing satisfactorily. Overall the appearance and condition of both the dam and appurtenant facilities is good. Only one clear, almost imperceptible seepage zone was located near the downstream toe of the dam. At present, this seep is not a hazard to the integrity of the dam.

There was no spalling or deterioration of the principal intake structure noted. Similarly, no potential detrimental spalling or deterioration of the emergency spillway concrete sill was noticed. Both the principal and emergency spillways appear to be in good condition. Vegetation in the principal spillway should be controlled and trees should not be allowed to develop. The hydrologic and hydraulic analyses performed by SCS and supplemental calculations performed using Corps of Engineers' criteria indicates that the structure would pass the PMF event. Thus, the spillway is considered "Adequate".

b. Adequacy of Information. Details of the structural stability and other design features of the embankment and appurtenant facilities are available through the SCS State Office in Harrisburg, Pennsylvania. The assessment of the embankment stability and its appurtenant structures was based primarily on the visual inspection, hydrologic and hydraulic analyses available in DER files and the supplemental hydrologic/hydraulic analyses performed. Subsequent review of the SCS files containing complete design and construction documentation confirmed the original assessment.

c. Urgency. It is suggested that the recommendations presented below be implemented during the maintenance program currently in progress.

d. Necessity of Additional Studies. Based on the data reviewed, no additional studies are recommended.

## 7.2 Remedial Measures.

a. Facilities. It is recommended that the following remedial measures be undertaken.

1. During the yearly maintenance program, all woody vegetation should be removed from the emergency spillway channel and emergency spillway side slopes to prevent deterioration of the system.
2. In addition to removing the debris from the principal intake structure, debris around the edges of the existing impoundment should be removed to minimize the possibility of clogging the intake structure during low frequency storms.
3. Since the embankment does not impound a significant head of water, desiccation of the embankment materials is possible. This would be evidenced by shrinkage cracks which could develop into erosion gullies. During the routine maintenance program and inspections, it is recommended that the embankment slope be thoroughly inspected for evidence of shrinkage cracks. Should cracks develop, it is recommended that the area be scarified, regraded, compacted and revegetated.

b. Operation and Maintenance Procedures. Because of the location of the dam upstream from a populated area (Tamaqua), a formal procedure of observation and warning during periods of high precipitation should be developed and implemented. The Owner should also develop a maintenance inspection checklist to help insure that all critical items are inspected on a periodic basis.



**APPENDIX**

**A**

NAME OF DAM Neifert Creek Dam

ID # PA 00654

CHECK LIST  
ENGINEERING DATA  
DESIGN, CONSTRUCTION, OPERATION  
PHASE I

ITEM

REMARKS

AS-BUILT DRAWINGS

DER files contained a full size and half size 15 sheet set of design drawings, No. PA-422A-P. SCS archive files Mechanicsburg, Pennsylvania contain as-built drawings.

REGIONAL VICINITY MAP

Yes. See SCS design drawings, Sheet 1 of 15.

CONSTRUCTION HISTORY

None in DER files except a few letters which mentioned percent completion or specific items which were complete. Two sets of field books, "Job Diary" and "Construction Records" are on file in SCS archives.

TYPICAL SECTIONS OF DAM

Yes. See SCS design drawings.

OUTLETS - PLAN

DETAILS

CONSTRAINTS

Yes. See SCS design drawings.

DISCHARGE RATINGS

Are in SCS files.

RAINFALL/RESERVOIR RECORDS

None available.

| ITEM  | REMARKS   |
|---|---|
| DESIGN REPORTS  | None in DER files, complete records located in SCS archives.  |
| GEOLOGY REPORTS   | None in DER files but a geology section is presented in the application form. Geologic information was found in the U.S. Geological Survey Geologic Quadrangle maps GQ 1133 and GQ 1054. Bedrock is Mauch Chunk formation and consists of sandstone and shale. A Geology report was also found in the SCS archives. |
| DESIGN COMPUTATIONS<br>HYDROLOGY & HYDRAULICS<br>DAM STABILITY<br>SEEPAGE STUDIES | A letter dated May 6, 1966 to Mr. Lunetta from Mr. Right (SCS) indicates the transmittal of Construction Plans, Flood Routings, geology, soils data, and specifications but this data was not found in DER files. Design computations are located in SCS archives.  |
| MATERIALS INVESTIGATIONS<br>BORING RECORDS<br>LABORATORY<br>FIELD                 | SCS design documents contained test boring data and compaction curves. Field test documentation located in SCS archives.  |
| POST-CONSTRUCTION SURVEYS OF DAM  | None.   |
| BORROW SOURCES  | SCS design plans showed potential borrow sources  |

| ITEM  | REMARKS                |
|---|------------------------|
| MONITORING SYSTEMS                                    | <i>None.</i>           |
| MODIFICATIONS   | <i>None.</i>           |
| HIGH POOL RECORDS                                     | <i>None available.</i> |
| POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS     | <i>None.</i>           |
| PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS | <i>None.</i>           |
| MAINTENANCE OPERATION RECORDS                         | <i>None.</i>           |

| ITEM                                   | REMARKS  |
|--|--|
| SPILLWAY PLAN                          | <i>This data is provided in SCS drawings PA-422A-P sheets 1 through 15.</i>  |
| SECTIONS                               |  |
| DETAILS                                |  |
| OPERATING EQUIPMENT<br>PLANS & DETAILS | <i>None. However, it is only a flood control structure and the normal reservoir is quite small.</i>  |
| CONSTRUCTION                           | <i>The contract was awarded to Schwartz and Baker, 285 E. Grove Street, Clarks Summit, Penna. on February 8, 1967. Other details were not available.</i> |
| PHOTOGRAPHS                            | <i>Eleven (11) photos were found in DER files showing construction phases and the completed structure.</i>   |



**APPENDIX**

**B**

CHECK LIST  
VISUAL INSPECTION  
PHASE I

Name Dam Neifert Creek Dam County Schuylkill State Pennsylvania National ID # PA 00654

Type of Dam Rolled Earth Hazard Category Significant

Date(s) Inspection May 23, 1978 Weather Mild Temperature 65-70° F

Pool Elevation at Time of Inspection 1086.1 M.S.L. Tailwater at Time of Inspection 1064 ± M.S.L.

Inspection Personnel:

Mary Beck (Hydrologist) Vince McKeever (Hydrologist)  
John Boschuk, Jr. (Geotechnical/Civil) Ray Lambert (Geologist)  
John H. Frederick, Jr. (Geotechnical)

John Boschuk, Jr. Recorder

Remarks:

Mr. Hugo Subprime- Owner's representative was on site and provided assistance, as necessary.



CONCRETE/MASONRY DAMS

| VISUAL EXAMINATION OF                      | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--|--------------|----------------------------|
| ANY NOTICEABLE SEEPAGE                     | N/A          |                            |
| STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS | N/A          |                            |
| DRAINS                                     | N/A          |                            |
| WATER PASSAGES                             | N/A          |                            |
| FOUNDATION                                 | N/A          |                            |

CONCRETE/MASONRY DAMS

| VISUAL EXAMINATION OF                | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|--------------------------------------|--------------|----------------------------|
| SURFACE CRACKS<br>CONCRETE SURFACES  | N/A          |                            |
| STRUCTURAL CRACKING                  | N/A          |                            |
| VERTICAL AND HORIZONTAL<br>ALIGNMENT | N/A          |                            |
| MONOLITH JOINTS                      | N/A          |                            |
| CONSTRUCTION JOINTS                  | N/A          |                            |

EMBANKMENT

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|--------------|----------------------------|
|-----------------------|--------------|----------------------------|

|                |                       |  |
|----------------|-----------------------|--|
| SURFACE CRACKS | <i>None observed.</i> |  |
|----------------|-----------------------|--|

|   |                       |  |
|---|-----------------------|--|
| UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE | <i>None observed.</i> |  |
|---|-----------------------|--|

|  |   |  |
|--|---|--|
| SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES | <i>No significant erosion was observed but motor bike traffic on the slope can be seen and will most likely be a source of erosion in the future.</i> |  |
|--|---|--|

|  |                               |  |
|--|-------------------------------|--|
| VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST | <i>No movements observed.</i> |  |
|--|-------------------------------|--|

|                 |                       |  |
|-----------------|-----------------------|--|
| RIPRAP FAILURES | <i>None observed.</i> |  |
|-----------------|-----------------------|--|

EMBANKMENT

| VISUAL EXAMINATION OF   | OBSERVATIONS  | REMARKS OR RECOMMENDATIONS |
|---|---|----------------------------|
| <p><b>JUNCTION OF EMBANKMENT<br/>AND ABUTMENT, SPILLWAY<br/>AND DAM</b></p> | <p><i>There is some very minor erosion at the embankment/abutment contact but it appears to be relatively stable.</i></p>   |                            |
| <p><b>ANY NOTICEABLE SEEPAGE</b></p>  | <p><i>A 5 foot diameter wet area is located on the west (upstream) side of the concrete sill located in the emergency spillway at its northern most limit. Seepage was observed near the left abutment (north) toe of the dam. Flow was traced in a 3-6 foot wide wet area to discharge outlet area in center of dam's downstream face. A spring (?) was located approximately 300 feet Northeast of left abutment (downstream) in an area of wasted boulders (flow approximately 3-5 gpm).</i></p> |                            |
| <p><b>STAFF GAGE AND RECORDER</b></p>                                       | <p><i>None.</i></p>   |                            |
| <p><b>DRAINS</b></p>  | <p><i>None.</i></p>   |                            |

OUTLET WORKS

*Principal Spillway*

| VISUAL EXAMINATION OF  | OBSERVATIONS  | REMARKS OR RECOMMENDATIONS |
|--|---|----------------------------|
| CRACKING AND SPALLING OF<br>CONCRETE SURFACES IN<br>OUTLET CONDUIT | <i>None observed.</i>   |                            |
| INTAKE STRUCTURE   | <i>The system consists of a single stage concrete overflow riser with a weir crest of 1086.<br/>The trash rack was clean.</i>   |                            |
| OUTLET STRUCTURE   | <i>This system consists of a 30 inch diameter reinforced concrete pipe buried in the embankment and approximately 272 feet long. It discharges into an impact basin with a baffle wall energy dissipater.</i>     |                            |
| OUTLET CHANNEL   | <i>The outlet channel is 12 feet wide and riprap lined for the first 20 feet downstream of the impact basin. It appears to be in good condition. Thereafter, the water flows into the natural stream channel.</i> |                            |
| EMERGENCY GATE   | <i>None.</i>  |                            |



UNGATED SPILLWAY

Sheet 7 of 11

Emergency Spillway

| <u>VISUAL EXAMINATION OF</u> | <u>OBSERVATIONS</u>   | <u>REMARKS OR RECOMMENDATIONS</u> |
|------------------------------|---|-----------------------------------|
| CONCRETE WEIR                | A 3 foot wide, 3 foot deep and 130 foot long concrete sill crosses the rock bottom emergency spillway. Top of the wall is reported to be at elevation 1113.6. The spillway appears to be in good condition, see photo 3.      |                                   |
| APPROACH CHANNEL             | The approach channel is 130 feet wide and appears to have a reverse grade of approximately 2 % but was designed as a level section. It has a minimum length of 100 feet.  |                                   |
| DISCHARGE CHANNEL            | The discharge section downstream of the concrete sill drains at an approximate 2.5 % grade for the first 115 feet. Thereafter, the slope increases to approximately 60 % and drains into the natural streambed (see photo 4). |                                   |
| BRIDGE AND PIERS             | None at the dam. The nearest bridge is a steel railroad tressel several hundreds of feet downstream of the dam on Little Schuylkill Creek.  |                                   |
| VEGETATION                   | Some woody plants are growing in the emergency spillway and should be removed before they become trees.   |                                   |

GATED SPILLWAY

Sheet 8 of 11

---

| VISUAL EXAMINATION OF | OBSERVATIONS | REMARKS OR RECOMMENDATIONS |
|-----------------------|--------------|----------------------------|
|-----------------------|--------------|----------------------------|

---

|               |              |  |
|---------------|--------------|--|
| CONCRETE SILL | <i>None.</i> |  |
|---------------|--------------|--|

---

|                  |              |  |
|------------------|--------------|--|
| APPROACH CHANNEL | <i>None.</i> |  |
|------------------|--------------|--|

---

|                   |              |  |
|-------------------|--------------|--|
| DISCHARGE CHANNEL | <i>None.</i> |  |
|-------------------|--------------|--|

---

|                  |              |  |
|------------------|--------------|--|
| BRIDGE AND PIERS | <i>None.</i> |  |
|------------------|--------------|--|

---

|                                  |              |  |
|----------------------------------|--------------|--|
| GATES AND OPERATION<br>EQUIPMENT | <i>None.</i> |  |
|----------------------------------|--------------|--|

---

INSTRUMENTATION

Sheet 9 of 11

VISUAL EXAMINATION                      OBSERVATIONS                      REMARKS OR RECOMMENDATIONS

MONUMENTATION/SURVEYS              *None.*

OBSERVATION WELLS                      *None.*

WEIRS    *None.*

PIEZOMETERS                                      *None.*

OTHER    *None. The nearest rain gage is at Still Creek Dam (National I.D. PA 00700 , DER I.D. No. 54-1111).*

RESERVOIR

Sheet 10 of 11

| <u>VISUAL EXAMINATION OF</u> | <u>OBSERVATIONS</u> | <u>REMARKS OR RECOMMENDATIONS</u> |
|------------------------------|---------------------|-----------------------------------|
|------------------------------|---------------------|-----------------------------------|

**SLOPES**

The reservoir side slopes are flat to moderate and well vegetated with trees and dense grass cover. There are a few erosion gullies but they are not significant relative to flood storage. The reservoir is relatively empty because it is used primarily for flood storage.

**SEDIMENTATION**

There is some sedimentation at the upper end of the reservoir (not significant as far as reducing available flood storage). Debris at the upper end and right shore line may have some effect on reducing flow through the principal spillway by clogging the trash racks. It will have little or no effect on the emergency spillway.



DOWNSTREAM CHANNEL

| VISUAL EXAMINATION OF                         | OBSERVATIONS   | REMARKS OR RECOMMENDATIONS |
|---|--|----------------------------|
| CONDITION<br>(OBSTRUCTIONS,<br>DEBRIS, ETC.)  | <i>There is one high railroad tressel downstream on the Little Schuylkill Creek.</i>   |                            |
| SLOPES  | <i>The channel bottom is on rock and the channel side slopes are rock. The stream channel gradient is approximately 5 % immediately below the dam.</i>   |                            |
| APPROXIMATE NO.<br>OF HOMES AND<br>POPULATION | <i>Neifert Creek drains into the Little Schuylkill Creek which flows through the town of Tamaqua approximately 4.8 miles downstream from the confluence of Neifert and Little Schuylkill Creeks.</i> |                            |

**APPENDIX**

**C**

NEIFERT CREEK DAM  
CHECK LIST  
HYDROLOGIC AND HYDRAULIC  
ENGINEERING DATADRAINAGE AREA CHARACTERISTICS: Moderate to steep slopes, about 50% wooded.ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 1086.0 (36 Ac-Ft)ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): 1113.6 (545 Ac-Ft)ELEVATION MAXIMUM DESIGN POOL: 1119.4ELEVATION TOP DAM: 1121.5

## EMERGENCY SPILLWAY:

- a. Elevation 1113.6
- b. Type Channel cut through rock.
- c. Width 130 feet
- d. Length 400 feet along center line.
- e. Location Spillover Left abutment
- f. Number and Type of Gates None

## PRINCIPAL SPILLWAY:

- a. Type Concrete riser and conduit.
- b. Location 180 feet from left abutment.
- c. Entrance inverts 1086.0
- d. Exit inverts 1063.0
- e. Emergency draindown facilities 50 feet of 24 inch pipe

## HYDROMETEOROLOGICAL GAGES:

- a. Type None
- b. Location \_\_\_\_\_
- c. Records \_\_\_\_\_

MAXIMUM NON-DAMAGING DISCHARGE: This structure controls only a small portion of the watershed above Tamaqua; therefore, no attempt has been made to estimate the maximum non-damaging discharge.

DAM SAFETY ANALYSIS  
HYDROLOGIC/HYDRAULIC DATA

Date: 6/12/78  
By: MFB  
Sheet: 2 of 6

DAM Neifert Creek Dam Nat. ID No. PA 654 DER No. 54-173

| ITEM/UNITS                                   | Permit/Design<br>Files<br>(A) | Calc. from<br>Files/Other<br>(B) | Calc. from<br>Observations<br>(C) |
|--|-------------------------------|----------------------------------|-----------------------------------|
| 1. Min. Crest Elev., ft.                     | <u>1121.5 ft.</u>             |                                  |                                   |
| 2. Freeboard, ft.                            |                               |                                  |                                   |
| 3. Spillway <sup>(1)</sup> Crest Elev, ft.   | <u>1086.0 ft</u>              |                                  |                                   |
| 3a. Secondary <sup>(2)</sup> Crest Elev, ft. | <u>1113.5 ft.</u>             |                                  |                                   |
| 4. Max. Pool Elev., ft.                      | <u>1119.4 ft.</u>             |                                  |                                   |
| 5. Max. Outflow <sup>(3)</sup> , cfs         | <u>9400 cfs</u>               |                                  |                                   |
| 6. Drainage Area, mi <sup>2</sup>            | <u>3.1 mile<sup>2</sup></u>   |                                  | <u>3.19 sq. mile</u>              |
| 7. Max Inflow <sup>(4)</sup> , cfs           |                               |                                  |                                   |
| 8. Reservoir Surf. Area, ft <sup>2</sup>     |                               |                                  |                                   |
| 9. Flood Storage                             | <u>545A-Ft.</u>               |                                  |                                   |
| 10. Inflow Volume, ft <sup>3</sup>           |                               |                                  |                                   |

Reference all figures by number or calculation on attached sheets:

Example: 3A - Drawing No. xxx by J. Doe, Engr., in State File No. yyyy.

NOTES:

- (1) Principal spillway
- (2) Emergency spillway
- (3) At maximum pool, with freeboard, ungated spillways only.
- (4) For columns B, C, use PMF



Date: 6/12/78  
By: MFB  
Sheet: 3 of 6

HYDROLOGIC/HYDRAULIC CALCULATIONS (cont.)

| Item (from sheet 2) | Source                                    |
|---------------------|---|
| 1A, 3A, 3aA, 4A, 6A | Construction Drawings, prepared<br>by SCS |
| 5A, 9A              | Application Report dated June 2, 1966     |
| 6C                  | USGS Map<br>Delano (1969)                 |

BY MFB DATE 6/12/78

SUBJECT

SHEET 4 OF 6

CHKD. BY [Signature] DATE 7/7/78

Neifert Creek Dam

JOB No.

Hydrology / Hydraulics

## Estimate of Spillway Discharge

## Principal Spillway

Riser - inside dimensions 2'6" x 7'6"

total weir length = 13'3"

Conduit - 30" dia. 271.4' Long concrete pipe

outlet invert 1063.0

$$Q = A_p \sqrt{\frac{2gH}{1 + K_e + K_p L_p}}$$

 $K_e$  = entrance loss - assume 0.4 $K_p$  = pipe loss, assume  $n = 0.012$ ,

$$\therefore K_p = 0.00706 \quad \text{NEH-5} \\ \text{ES-42}$$

 $L_p$  = length of pipe $A_p$  = area of pipe

$$Q = 4.91 \sqrt{\frac{64.4}{140.4 + 0.00706 \cdot 271.4}} H^{1/2}$$

$$= 20.96 H^{1/2}$$

Reservoir water level at 1113.5

$$H = 1113.5 - (1063.0 + 0.4 \cdot 2.5) \\ = 49 \text{ ft.}$$

$Q = 147 \text{ cfs}$ ; therefore, value listed in application report is reasonable

## Emergency Spillway

Crest - 1113.5 ft.

Top of Dam - 1121.5

Width - 130 ft.

$$\text{Maximum Head} = 1121.5 - 1113.5 = 8 \text{ ft.}$$

assume  $n = 0.04$  given exit slope = 0.025

side slopes are 1/4:1 (H:V)

therefore assume rectangular section to determine critical depth

BY MFB DATE 6/12/78

SUBJECT \_\_\_\_\_

SHEET 5 OF 6CHKD. BY [Signature] DATE 7/2/78Neifert Creek Dam

JOB No. \_\_\_\_\_

Hydrology / Hydraulics

Emergency Spillway (cont.)

Critical Depth for  $Q = 9400$  cfs (Application Report)

$$d_c = \sqrt[3]{\frac{Q^2}{g}} \quad g = \frac{Q}{b} = \frac{9400}{130} = 72.3$$

$$d_c = \sqrt[3]{\frac{72.3^2}{32.2}}$$

$$= 5.45 \text{ ft.}$$

Normal Depth  $d_n$  on Exit Slope

$$Q = \frac{K'}{n} b^{5/3} S^{1/2}$$

King &amp; Brater Hydraulic Handbook

$$9400 = \frac{K'}{0.04} 130^{5/3} 0.025^{1/2}$$

$$K' = 0.0055$$

| $D/b$ | $K'$    |
|-------|---------|
| 0.03  | 0.00419 |
|       | 0.0055  |
| 0.04  | 0.0067  |

$$D/b = 0.0352$$

$$D = d_n = 4.58 \text{ ft}$$

therefore flow down slope is supercritical and depth of flow at level section & exit slope is approximately  $d_c$ .

Losses in approach channel are assumed to be less than  $(8 - 5.45)$  2.55 ft. and reported flow is reasonable.

BY MEB DATE 6/12/78 SUBJECT \_\_\_\_\_ SHEET 6 OF 6  
CHKD. BY [Signature] DATE 7/7/78 Neifert Creek Dam JOB No. \_\_\_\_\_  
Hydrology/Hydraulics

Neifert Creek Dam Drainage Area = 3.1 sq. miles

Compare to Quakake Creek: estimated PMF peak inflow  
is 9620 cfs for 6.7 sq. miles

$$Q = \text{Peak Inflow to Neifert Creek} = \left(\frac{3.1}{6.7}\right)^{0.8} 9620$$

$$Q = 5193 \text{ cfs}$$

Say 5190 cfs

Estimated Peak Outflow > Peak Inflow from above  
9400 cfs > 5190 cfs

**THEREFORE: SPILLWAY SYSTEM IS ADEQUATE**



**APPENDIX**

**D**



VIEW OF INTAKE STRUCTURE.

PHOTO NO. 1



VIEW OF OUTFALL STRUCTURE. BAFFLE WALL IS SHOWN ON  
PHOTO IN FRONT OF OUTFALL PIPE.

PHOTO NO. 2



LOOKING ACROSS EMERGENCY SPILLWAY ALONG CONCRETE SILL.  
ONE SIDE HILL SEEP WAS NOTED UPSTREAM OF THE WALL NEAR  
THE LEFT ABUTMENT. SEEP IS LOCATED NEAR THE INSPECTOR.

PHOTO NO. 3





VIEW LOOKING ALONG EMERGENCY SPILLWAY. THE DISCHARGE  
WOULD DRAIN INTO THE NATURAL STREAMBED AS SHOWN.

PHOTO NO. 4



VIEW OF CHANNEL DOWNSTREAM OF OUTFALL STRUCTURE.  
EMERGENCY SPILLWAY IS LOCATED ON LEFT SIDE OF PHOTO.

PHOTO NO. 5

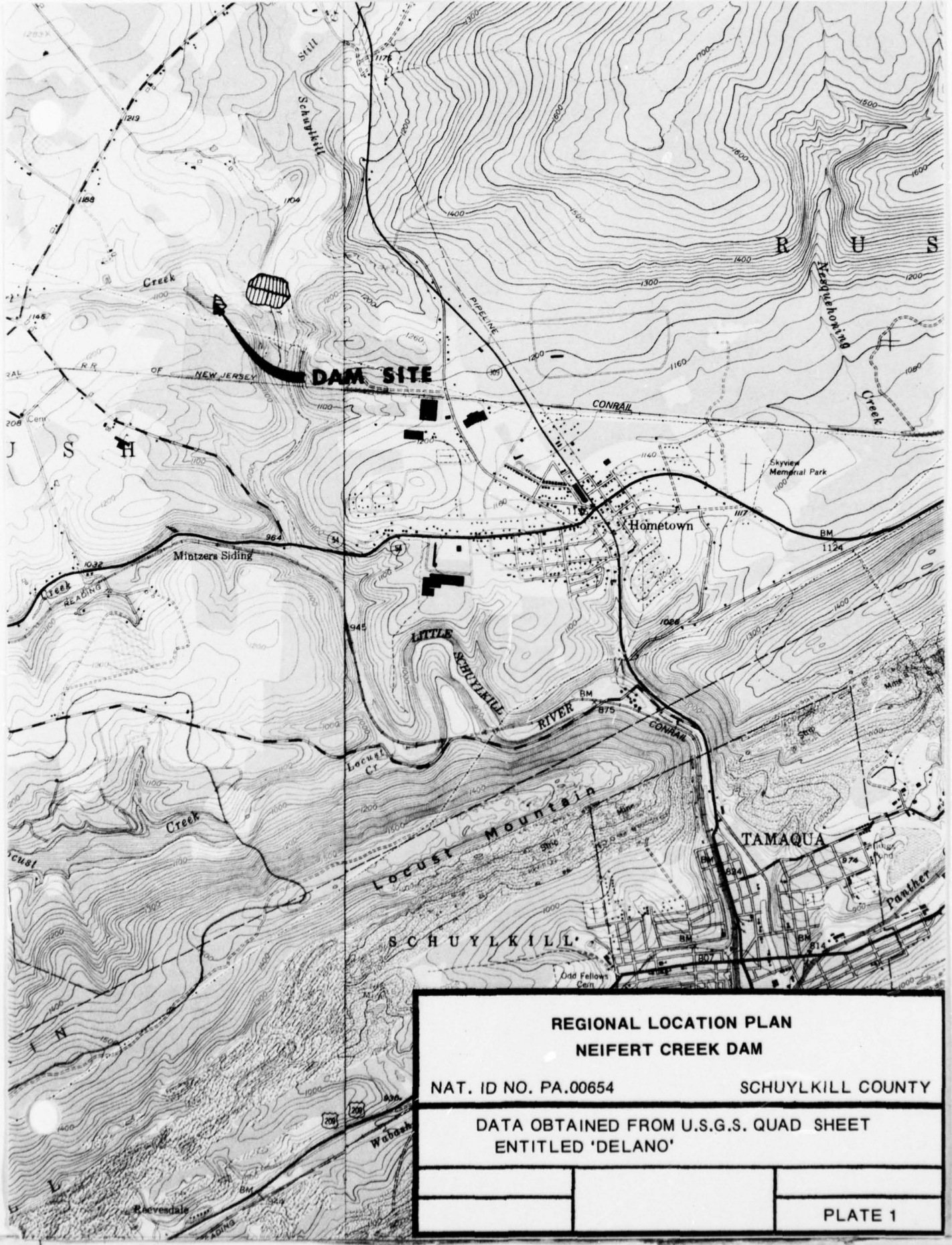


SEEPAGE OBSERVED AT THE JUNCTION OF THE  
DAM (LEFT) WITH THE NATURAL ABUTMENT (RIGHT).  
THE SEEP IS LOCATED APPROXIMATELY 20 FEET  
UPSLOPE OF THE OUTFALL STRUCTURE.

**APPENDIX**

**E**





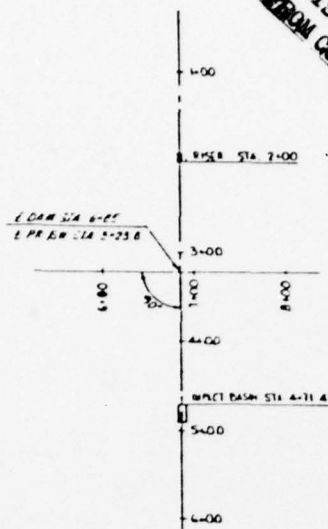
**REGIONAL LOCATION PLAN  
NEIFERT CREEK DAM**

NAT. ID NO. PA.00654                      SCHUYLKILL COUNTY

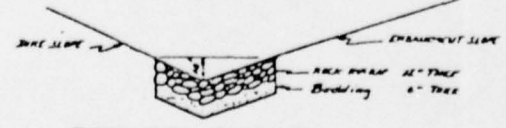
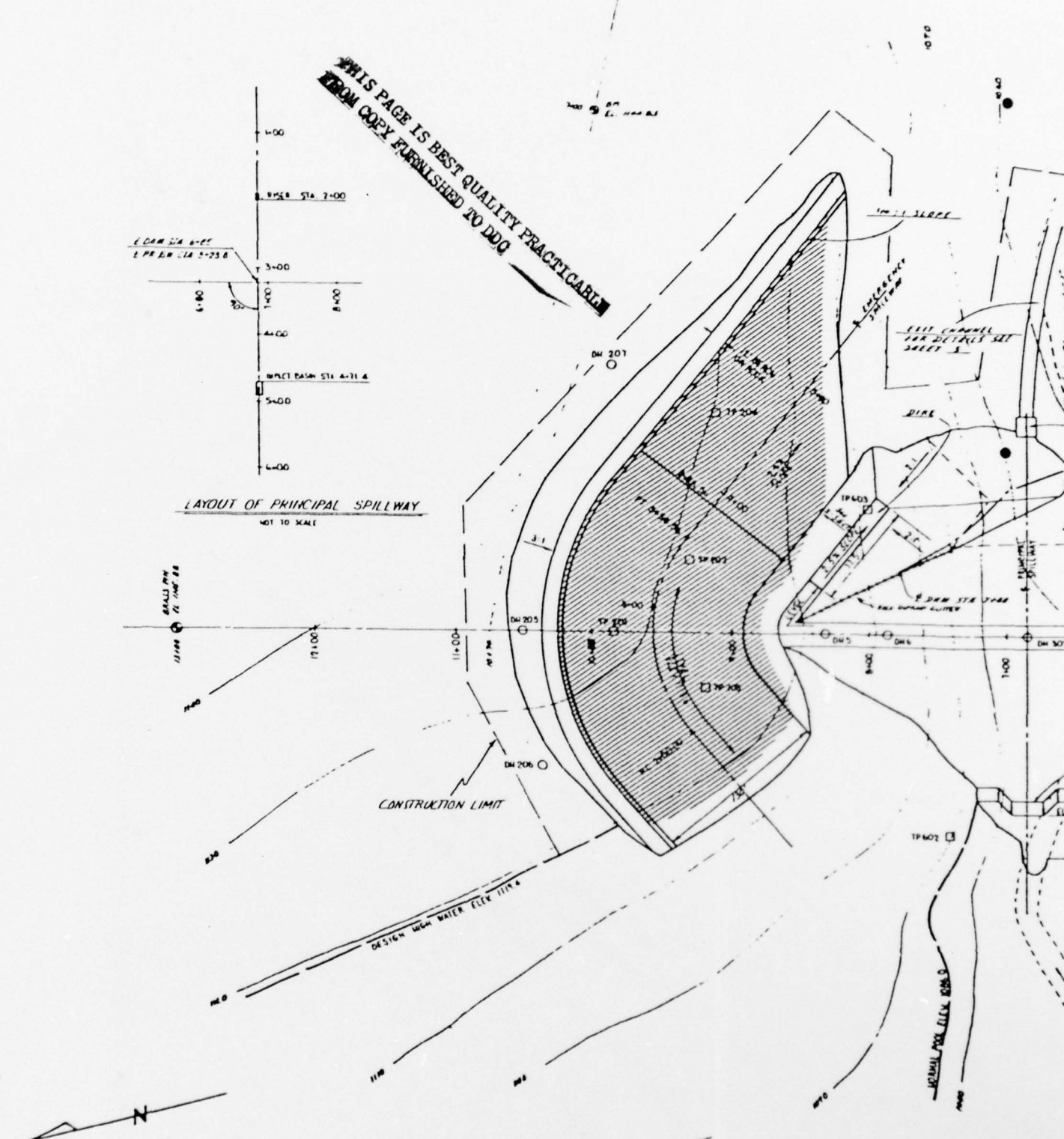
DATA OBTAINED FROM U.S.G.S. QUAD SHEET  
ENTITLED 'DELANO'

|  |  |         |
|--|--|---------|
|  |  | PLATE 1 |
|--|--|---------|

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LAYOUT OF PRINCIPAL SPILLWAY  
NOT TO SCALE



TYPICAL SECTION - RIPRAP GUTTER  
(NOT TO SCALE)

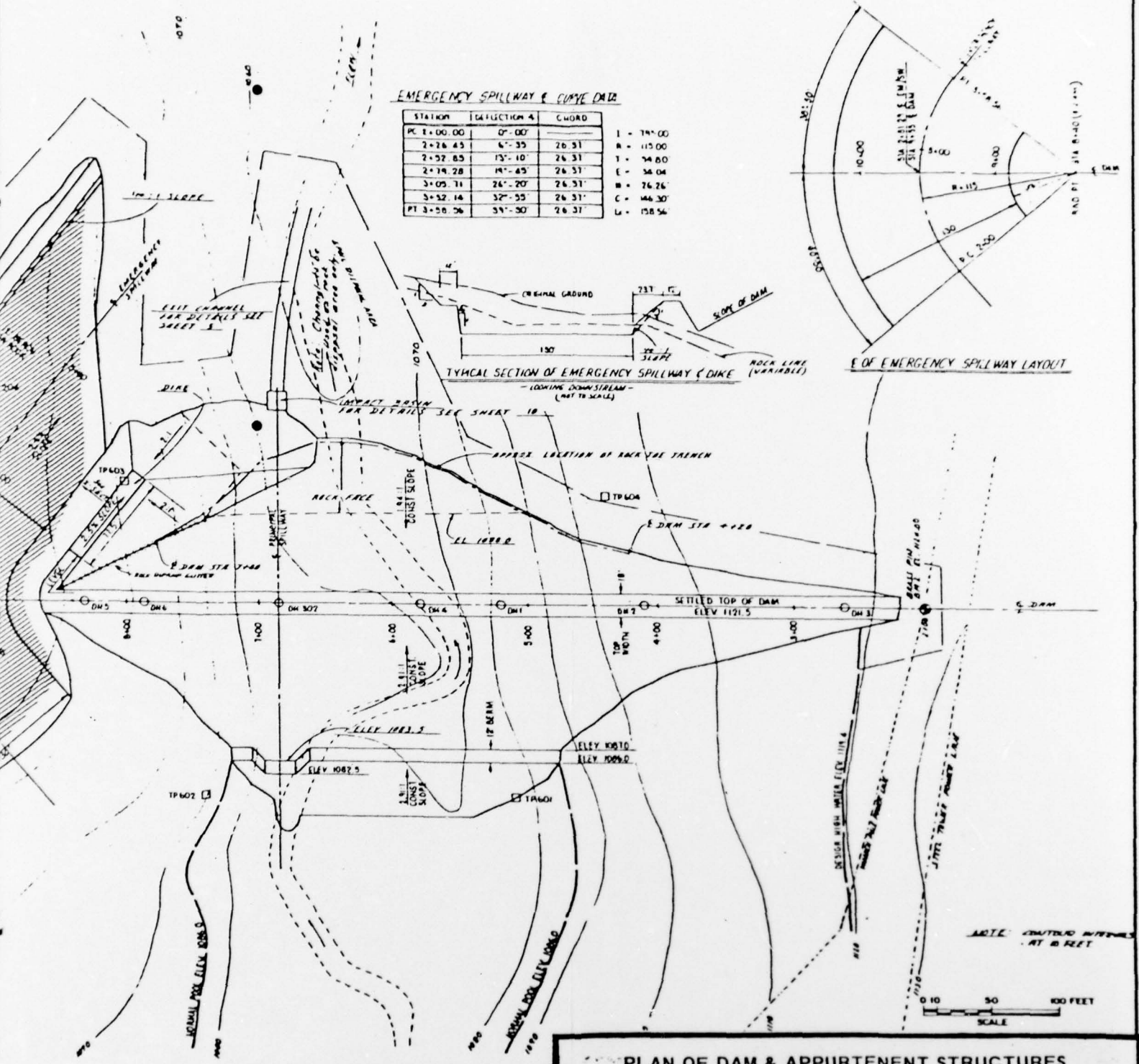
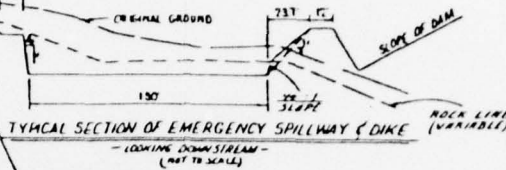
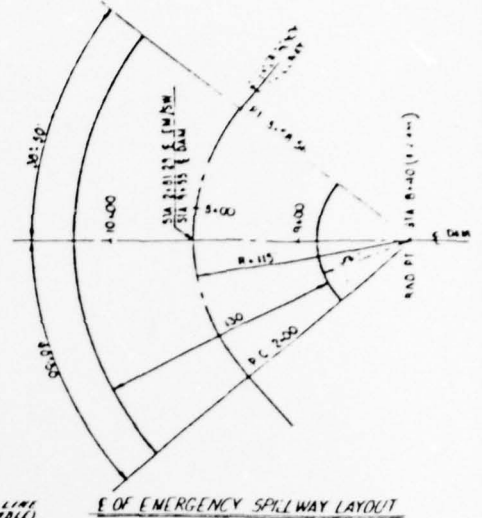
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EMERGENCY SPILLWAY & CURVE DATA

| STATION    | DEFLECTION ANGLE | CHORD  |             |
|------------|------------------|--------|-------------|
| PC 1+00.00 | 0°-00'           |        | L = 74° 00' |
| 2+26.45    | 6°-35'           | 26.31' | R = 115.00' |
| 2+52.85    | 13°-10'          | 26.31' | T = 74.00'  |
| 2+79.28    | 19°-45'          | 26.31' | E = 36.04'  |
| 3+05.71    | 26°-20'          | 26.31' | M = 26.26'  |
| 3+32.14    | 32°-55'          | 26.31' | C = 46.30'  |
| PT 3+58.56 | 39°-30'          | 26.31' | L = 158.56' |



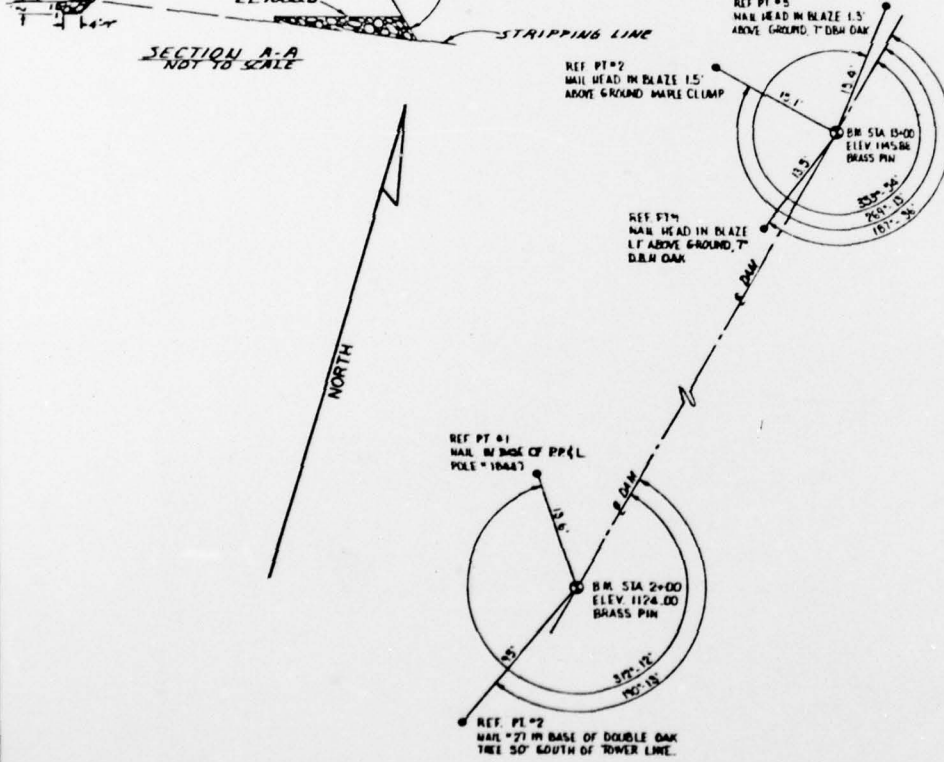
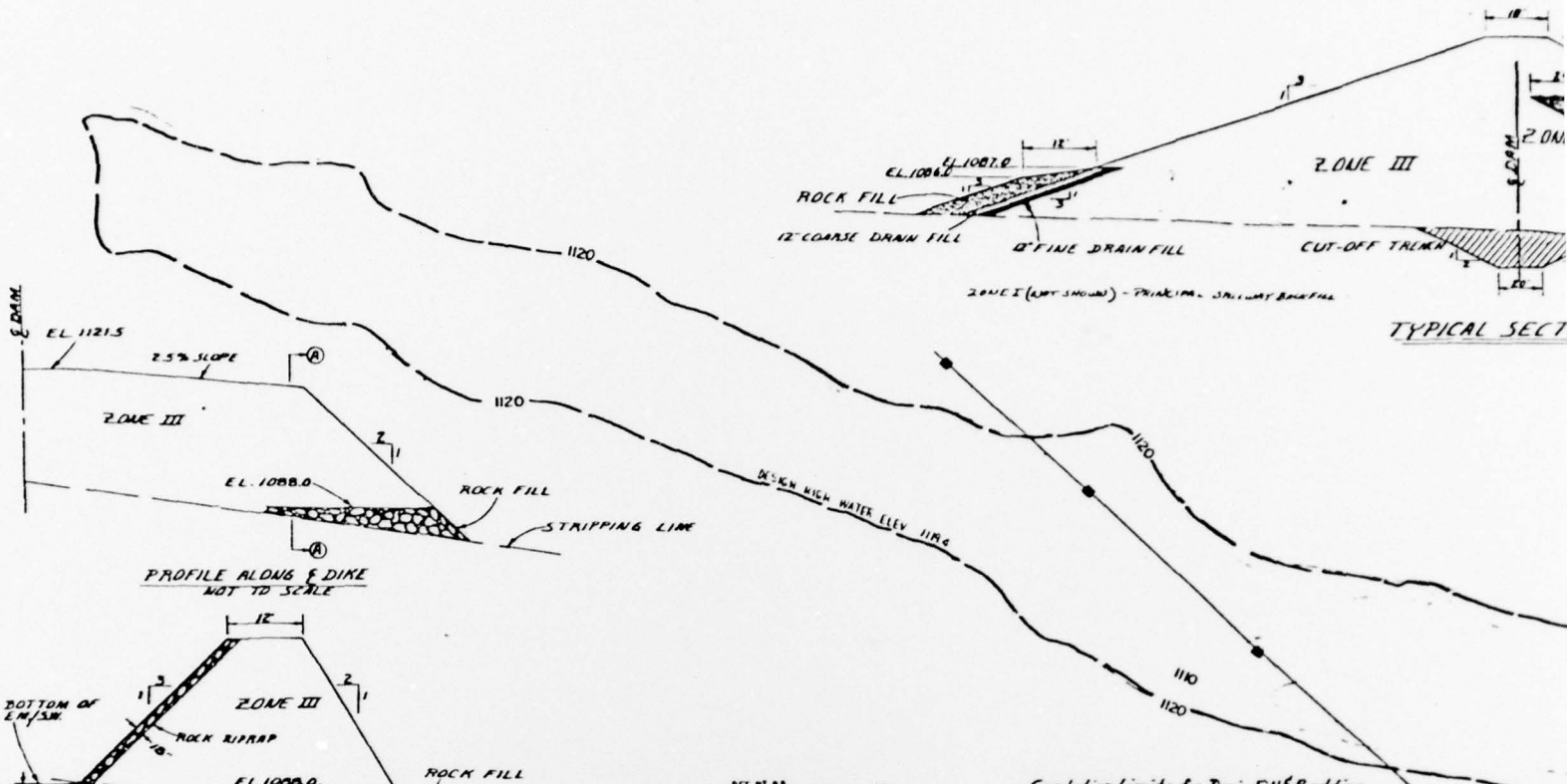
**LEGEND:**  
 ● SEEPAGE LOCATION

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|   |                   |
|---|-------------------|
| <b>PLAN OF DAM &amp; APPURTENENT STRUCTURES</b>   |                   |
| <b>NEIFERT CREEK DAM</b>  |                   |
| NAT. ID NO. PA. 00654   | SCHUYLKILL COUNTY |
| DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 3 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966 |                   |
| THIS PAGE IS BEST QUALITY PRACTICABLE<br>FROM COPY FURNISHED TO DDC   | <b>PLATE 2</b>    |

2





Gradation Limits for Drain Fills Bedding

| Design data for Fine Drain Fill Bedding |           | Design data for Coarse Drain Fill |           |
|---|-----------|-----------------------------------|-----------|
| Size No.                                | % Passing | Size No.                          | % Passing |
| 3"                                      | 100       | 6"                                | 100       |
| 2"                                      | 93-100    | 3"                                | 77-100    |
| 1 1/2"                                  | 89-100    | 2"                                | 65-88     |
| 1"                                      | 83-100    | 1 1/2"                            | 58-81     |
| 3/4"                                    | 79-95     | 1"                                | 48-71     |
| 1/2"                                    | 73-89     | 3/4"                              | 41-63     |
| 3/8"                                    | 69-85     | 5/8"                              | 33-54     |
| 1/4"                                    | 59-75     | 3/8"                              | 28-49     |
| 10                                      | 46-61     | 4                                 | 17-35     |
| 30                                      | 28-42     | 10                                | 21        |
| 60                                      | 15-29     | 20                                | 4.5       |
| 100                                     | 15        |                                   |           |
| 200                                     | < 5       |                                   |           |

EARTH FILL REQUIREMENTS

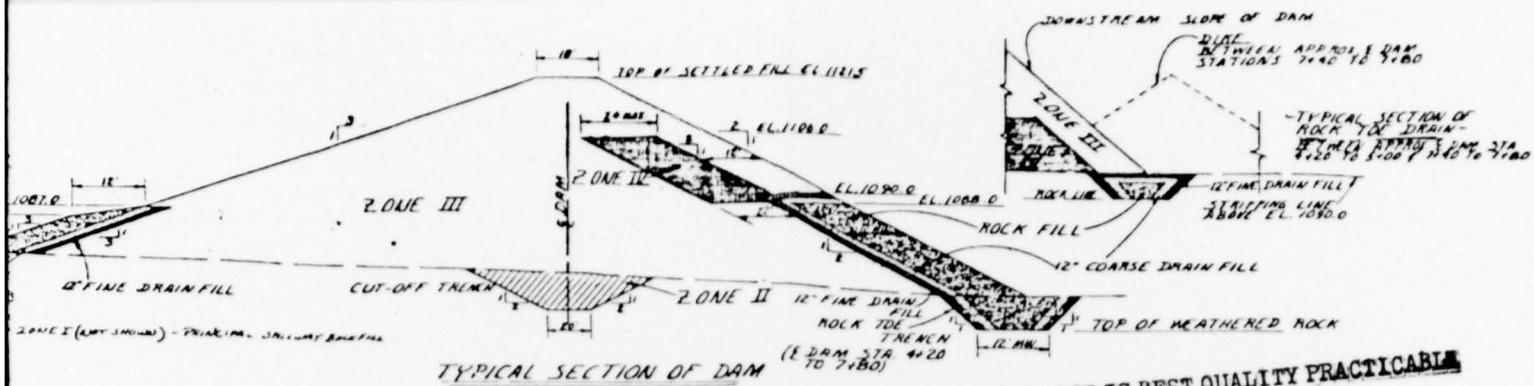
| Z/D ITEM | ZONE | MATERIAL  | MAX. ROCK SIZE | MAX. LIFT | REQ'D WATER CONTENT    | COMPL. |            |
|----------|------|---|----------------|-----------|------------------------|--------|------------|
|          |      |   |                |           |                        | CLASS  | 100% BY ME |
| 7        | I    | MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC   | 6"             | 9"        | OPTIMUM ± 1.0%         | A      | 100% BY ME |
| 7        | II   | MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC   | 6"             | 9"        | OPTIMUM ± 1.0%         | A      | 55% BY ME  |
| 7        | III  | MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC. BY TP-113 DEPTH 0.5 TO 10.5 FT. CLASSIFIED AS GM, AND BY TP-121 DEPTH 0.6 TO 8.0 FT., CLASSIFIED AS GC | 6"             | 9"        | OPTIMUM ± 2.0% - ZERO% | B      | 55% BY ME  |
| 7        | III  | MATERIAL AS REPRESENTED BY DN-207, DEPTH 10.0 TO 14.0 FT., CLASSIFIED AS SILTSTONE  | 8"             | 12"       | NATURAL                | T      | 54%        |

1) MAXIMUM PERMISSIBLE LIFT THICKNESS BEFORE COMPACTION  
 2) WATER CONTENT OF FILL MATRIX AT TIME OF COMPACTION  
 NOTE: ZONE I MATERIAL SEE SHEET 3.

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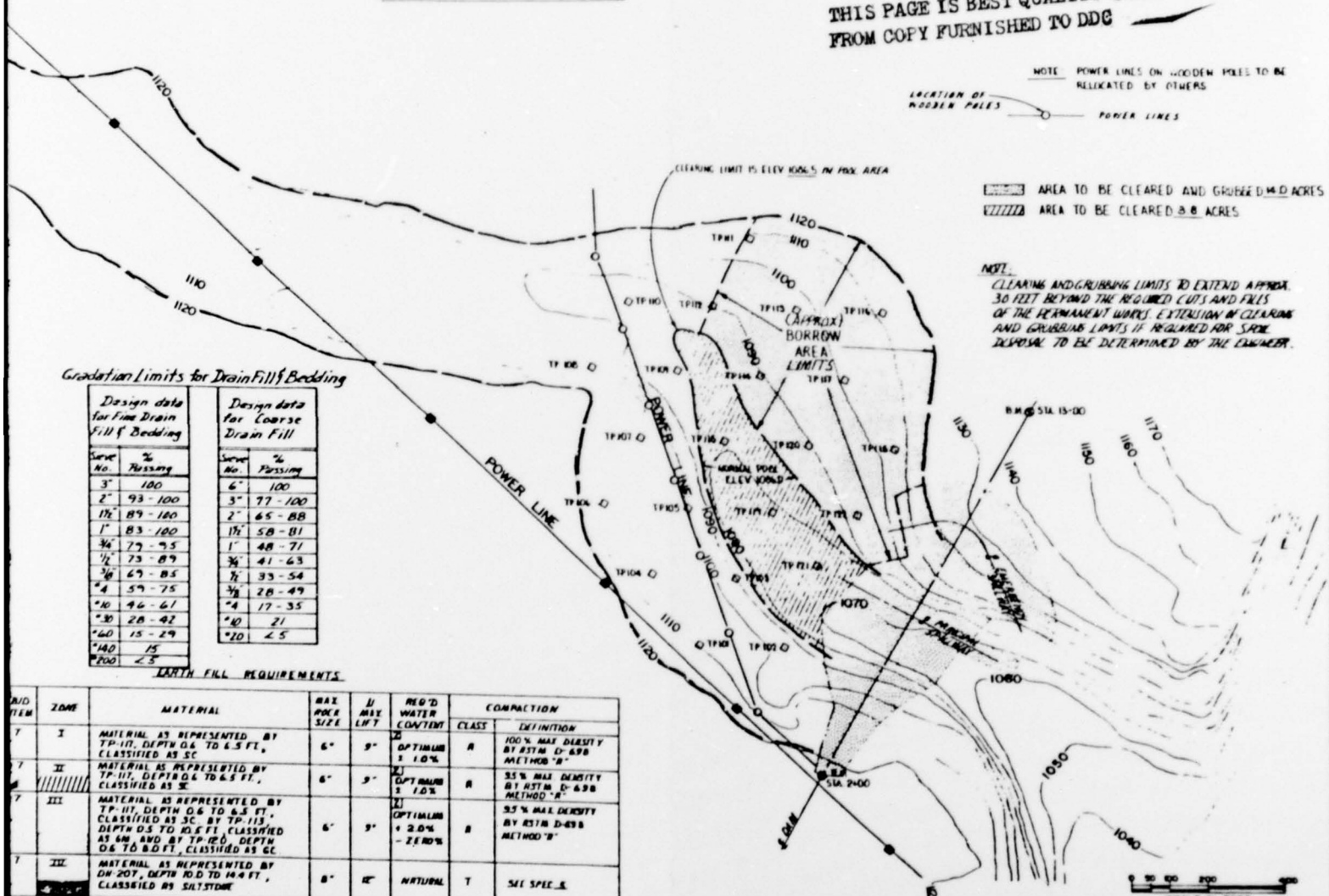
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NOTE: POWER LINES ON WOODEN POLES TO BE RELOCATED BY OTHERS.  
 LOCATION OF WOODEN POLES ——— POWER LINES



**Gradation Limits for Drain Fills Bedding**

| Design data for Fine Drain Fill Bedding |           | Design data for Coarse Drain Fill |           |
|---|-----------|-----------------------------------|-----------|
| Size No.                                | % Passing | Size No.                          | % Passing |
| 3"                                      | 100       | 6"                                | 100       |
| 2"                                      | 93-100    | 3"                                | 77-100    |
| 1 1/2"                                  | 89-100    | 2"                                | 65-88     |
| 1"                                      | 83-100    | 1 1/2"                            | 58-81     |
| 3/4"                                    | 77-95     | 1"                                | 48-71     |
| 1/2"                                    | 73-89     | 3/4"                              | 41-63     |
| 3/8"                                    | 69-85     | 5/8"                              | 33-54     |
| 5/16"                                   | 59-75     | 3/8"                              | 28-49     |
| 3/16"                                   | 46-61     | 5/16"                             | 17-35     |
| 1/4"                                    | 28-42     | 3/16"                             | 21        |
| 5/16"                                   | 15-29     | 1/4"                              | 25        |
| 3/8"                                    | 15        |                                   |           |
| 1/2"                                    | < 5       |                                   |           |

**EARTH FILL REQUIREMENTS**

| D/D ITEM | ZONE | MATERIAL   | MAX POLE SIZE | MAX LIFT | REQ'D WATER CONTENT    | CONSTRUCTION |   |
|----------|------|--|---------------|----------|------------------------|--------------|---|
|          |      |  |               |          |                        | CLASS        | DEFINITION                                |
| 1        | I    | MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC  | 6"            | 9"       | OPTIMUM ± 1.0%         | R            | 100% MAX DENSITY BY ASTM D-698 METHOD "B" |
| 2        | II   | MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SE  | 6"            | 9"       | OPTIMUM ± 1.0%         | R            | 95% MAX DENSITY BY ASTM D-698 METHOD "B"  |
| 3        | III  | MATERIAL AS REPRESENTED BY TP-117, DEPTH 0.6 TO 6.5 FT., CLASSIFIED AS SC BY TP-113, DEPTH 0.5 TO 10.5 FT., CLASSIFIED AS 6H AND BY TP-120, DEPTH 0.6 TO 8.0 FT., CLASSIFIED AS GC | 6"            | 9"       | OPTIMUM ± 2.0% - 2.80% | R            | 95% MAX DENSITY BY ASTM D-698 METHOD "B"  |
| 4        | III  | MATERIAL AS REPRESENTED BY DW-207, DEPTH 10.0 TO 14.4 FT., CLASSIFIED BY SILTSTONE   | 8"            | 12"      | NATURAL                | T            | SEE SPEC. 8                               |

1) MAXIMUM PERMISSIBLE LIFT THICKNESS BEFORE CONSTRUCTION  
 2) WATER CONTENT OF FILL MATERIAL AT TIME OF CONSTRUCTION  
 3) ZONE I MATERIAL SEE SHEET 5

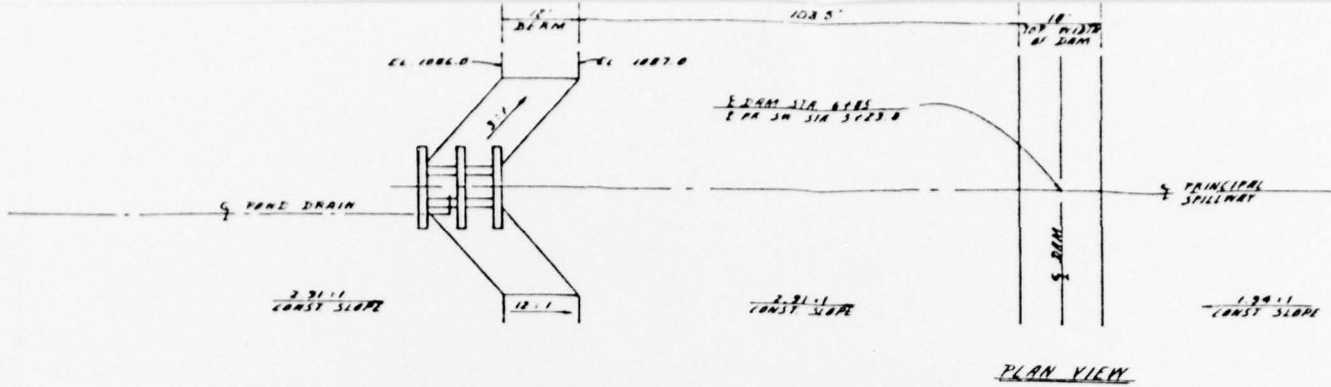
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**PLAN OF RESERVOIR & TYPICAL DAM SECTION NEIFERT CREEK DAM**

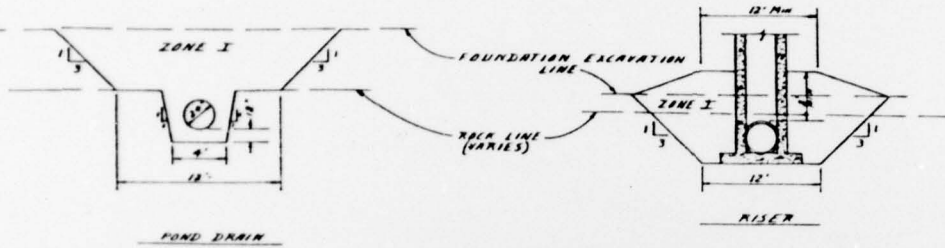
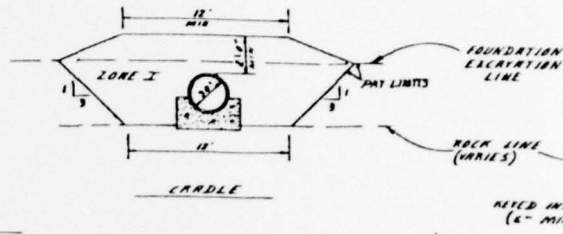
NAT. ID NO. PA.00654      SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 2 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

PLATE 3



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**NOTE:** 24" PIPE SECTIONS ARE TO HAVE HALF BEVELS AT JOINTS J-3, J-5, J-6 AND J-7; AT JOINTS J-2 AND J-4 20" PIPE SECTIONS ARE TO HAVE FULL BEVELS. 18" PIPE SECTIONS ARE TO HAVE HALF BEVELS AT JOINTS J-9, J-5 AND J-7. AT JOINTS J-3 AND J-6 18" PIPE SECTIONS ARE TO HAVE FULL BEVELS. ALL OTHER PIPE SECTIONS ARE STRAIGHT (NO BEVEL). MANUFACTURER TO CLEARLY MARK BEVELLED SECTIONS.



**30" x 12" PRINCIPAL SPILLWAY PIPE JOINT DATA**

| FOR 18" SECTIONS OF PIPE |                      |                  |
|--------------------------|----------------------|------------------|
| JOINT                    | DIST FROM RISER WALL | INVERT ELEVATION |
| J-1                      | 0.3'                 | 1071.00          |
| J-2                      | 16.3'                | 1071.00          |
| J-3                      | 32.3'                | 1071.00          |
| J-4                      | 48.3'                | 1069.00          |
| J-5                      | 64.3'                | 1069.00          |
| J-6                      | 80.3'                | 1066.20          |
| J-7                      | 96.3'                | 1065.55          |
| J-8                      | 112.3'               | 1064.80          |
| J-9                      | 128.3'               | 1064.00          |
| J-10                     | 144.3'               | 1063.00          |
| J-11                     | 160.3'               | 1063.10          |
| J-12                     | 176.3'               | 1063.40          |
| J-13                     | 192.3'               | 1063.60          |
| J-14                     | 208.3'               | 1063.60          |
| J-15                     | 224.3'               | 1063.60          |
| J-16                     | 240.3'               | 1063.60          |
| J-17                     | 256.3'               | 1063.60          |
| OUTLET                   | 272.3'               | 1063.00          |

| FOR 20" SECTIONS OF PIPE |                      |                  |
|--------------------------|----------------------|------------------|
| JOINT                    | DIST FROM RISER WALL | INVERT ELEVATION |
| J-1                      | 0.3'                 | 1071.00          |
| J-2                      | 20.3'                | 1071.00          |
| J-3                      | 40.3'                | 1069.50          |
| J-4                      | 60.3'                | 1068.75          |
| J-5                      | 80.3'                | 1068.50          |
| J-6                      | 100.3'               | 1065.00          |
| J-7                      | 120.3'               | 1064.25          |
| J-8                      | 140.3'               | 1064.25          |
| J-9                      | 160.3'               | 1064.25          |
| J-10                     | 180.3'               | 1064.25          |
| J-11                     | 200.3'               | 1064.15          |
| J-12                     | 220.3'               | 1063.95          |
| J-13                     | 240.3'               | 1063.70          |
| J-14                     | 260.3'               | 1063.40          |
| OUTLET                   | 280.3'               | 1063.00          |

**PRINCIPAL SPILLWAY ANTI-SEEP COLLAR DATA**

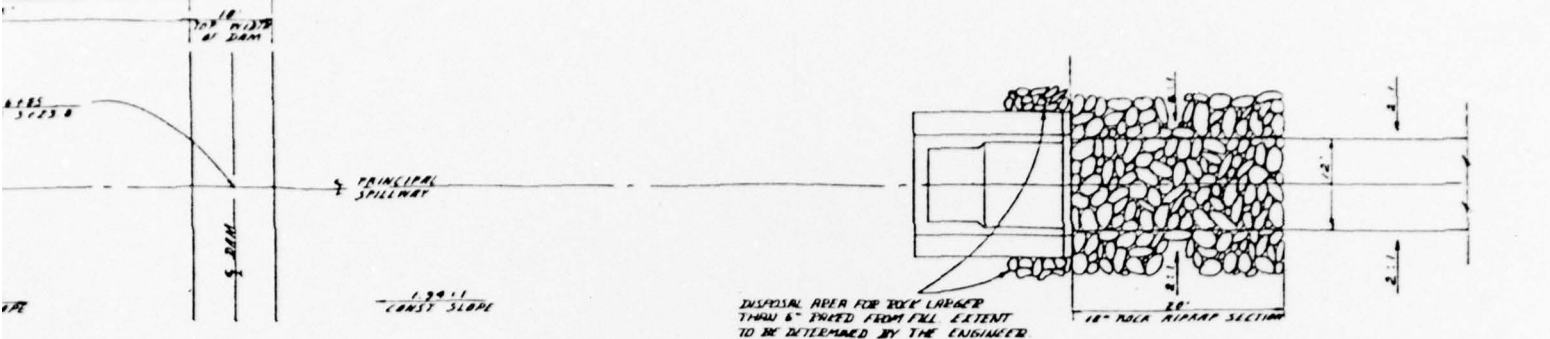
| FOR 18" SECTIONS OF PIPE |                      |                  |
|--------------------------|----------------------|------------------|
| COLLAR                   | DIST FROM RISER WALL | INVERT ELEVATION |
| I                        | 25.3'                | 1071.00          |
| II                       | 50.3'                | 1069.50          |
| III                      | 75.3'                | 1066.70          |
| IV                       | 90.3'                | 1066.40          |
| V                        | 123.3'               | 1069.25          |
| VI                       | 140.3'               | 1063.70          |
| VII                      | 173.3'               | 1063.42          |
| VIII                     | 199.3'               | 1063.60          |

| FOR 20" SECTIONS OF PIPE |                      |                  |
|--------------------------|----------------------|------------------|
| COLLAR                   | DIST FROM RISER WALL | INVERT ELEVATION |
| I                        | 25.3'                | 1070.63          |
| II                       | 50.3'                | 1069.13          |
| III                      | 75.3'                | 1067.06          |
| IV                       | 90.3'                | 1066.15          |
| V                        | 123.3'               | 1069.25          |
| VI                       | 140.3'               | 1064.25          |
| VII                      | 173.3'               | 1064.25          |
| VIII                     | 199.3'               | 1064.10          |

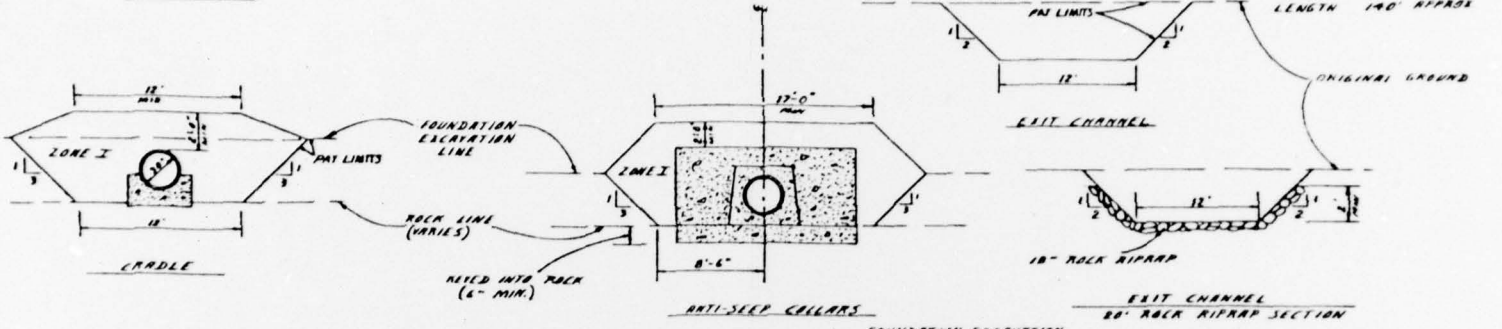
30" INSIDE DIA REINFORC  
0 20' STRAIGHT SECT  
2 20' FULL BEVEL SECT  
4 20' HALF BEVEL SECT  
1 WALL PIECE (FOR 18"  
PRESSURE HEAD = 60'  
LOAD = 47,000 LBS PER  
MIN. 3 EDGE BEARING  
0.01" CRACK MAX  
0.001" CRACK PER  
TOTAL L

**PROFILE ALONG E OF PRINCIPAL SPILLWAY**

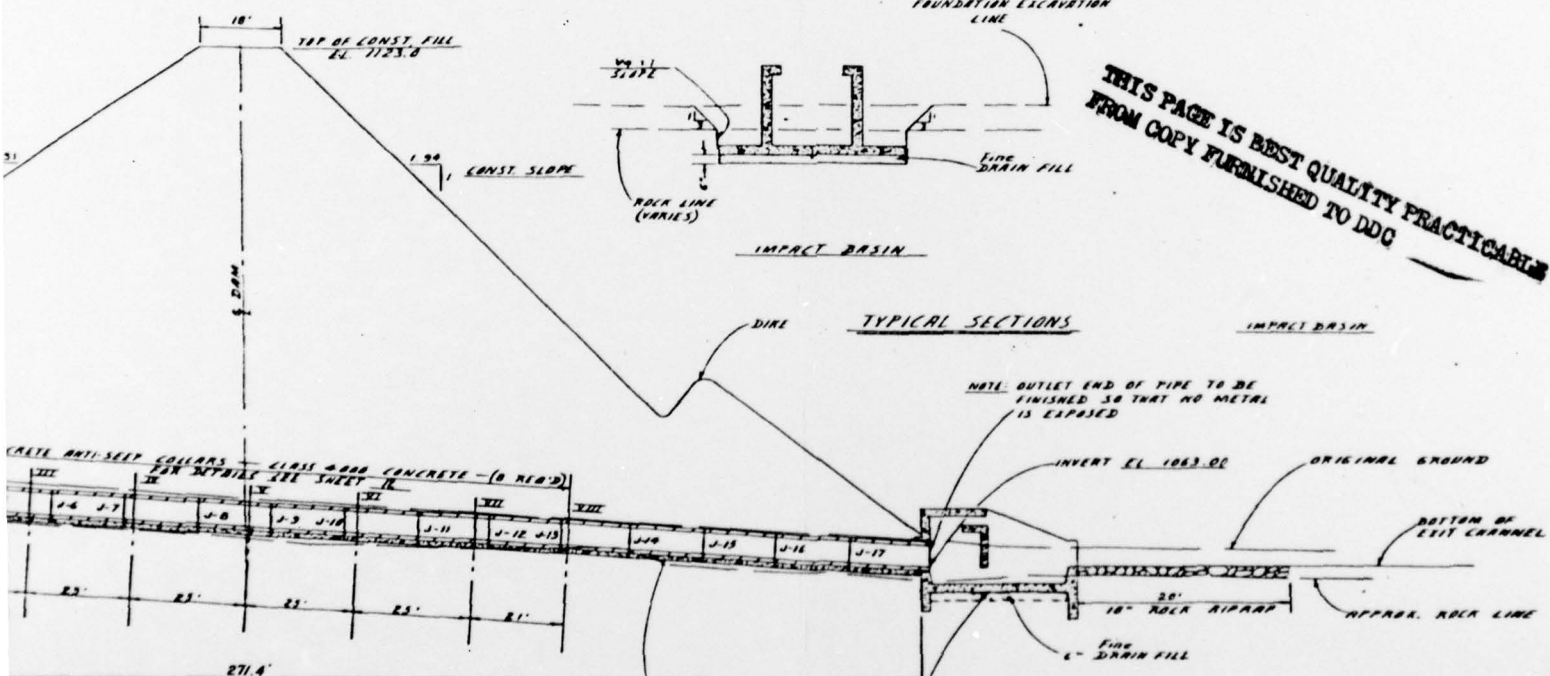
NOTE: PLAN AND PROFILE ARE BASED



PLAN VIEW



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TYPICAL SECTIONS

PROFILE ALONG E OF PRINCIPAL SPILLWAY

ANTI-SLEEP COLLAR DATA

| COLLAR | DIST FROM RISEN WALL | INVERT ELEVATION |
|--------|----------------------|------------------|
| I      | 25.3'                | 1070.63          |
| II     | 54.3'                | 1069.13          |
| III    | 75.3'                | 1067.06          |
| IV     | 98.3'                | 1065.15          |
| V      | 123.3'               | 1064.25          |
| VI     | 148.3'               | 1064.25          |
| VII    | 173.3'               | 1064.25          |
| VIII   | 198.3'               | 1064.18          |

30" INSIDE DIA REINFORCED CONCRETE PRESSURE PIPE  
 8 20' STRAIGHT SECTIONS  
 2 20' FULL BEVEL SECTIONS  
 4 20' HALF BEVEL SECTIONS  
 1 WALL PIECE (FOR 10" WALL)  
 PRESSURE HEAD = 60'  
 LOAD = 67,000 LBS PER LIN. FT., BASED ON MIN 3 EDGE BEARING STRENGTH FOR 0.01" CRACK NON-PRESTRESSED PIPE & 0.001" CRACK PRESTRESSED PIPE  
 TOTAL LENGTH 200.3' FOR 378.3' FOR

**PRINCIPAL SPILLWAY  
NEIFERT CREEK DAM**

NAT. ID NO. PA. PA.00654      SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 5 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

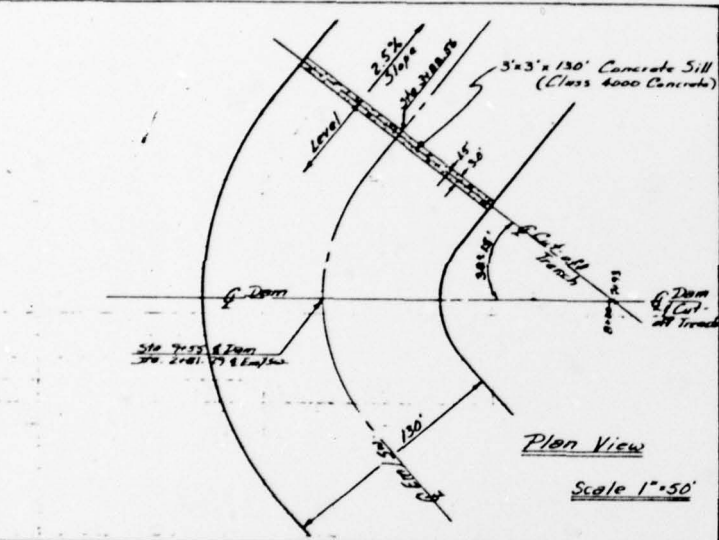
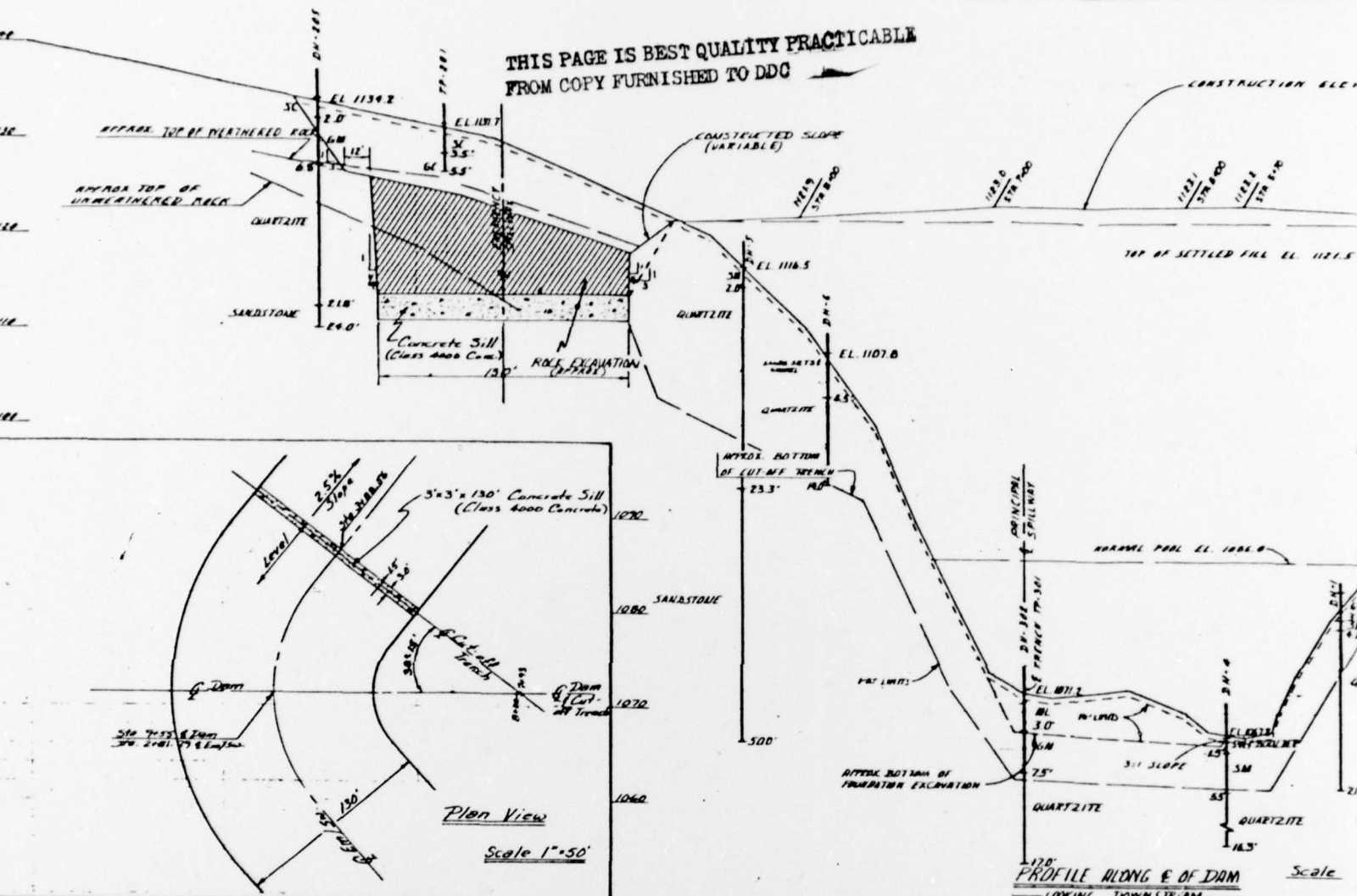
2

PLATE 4

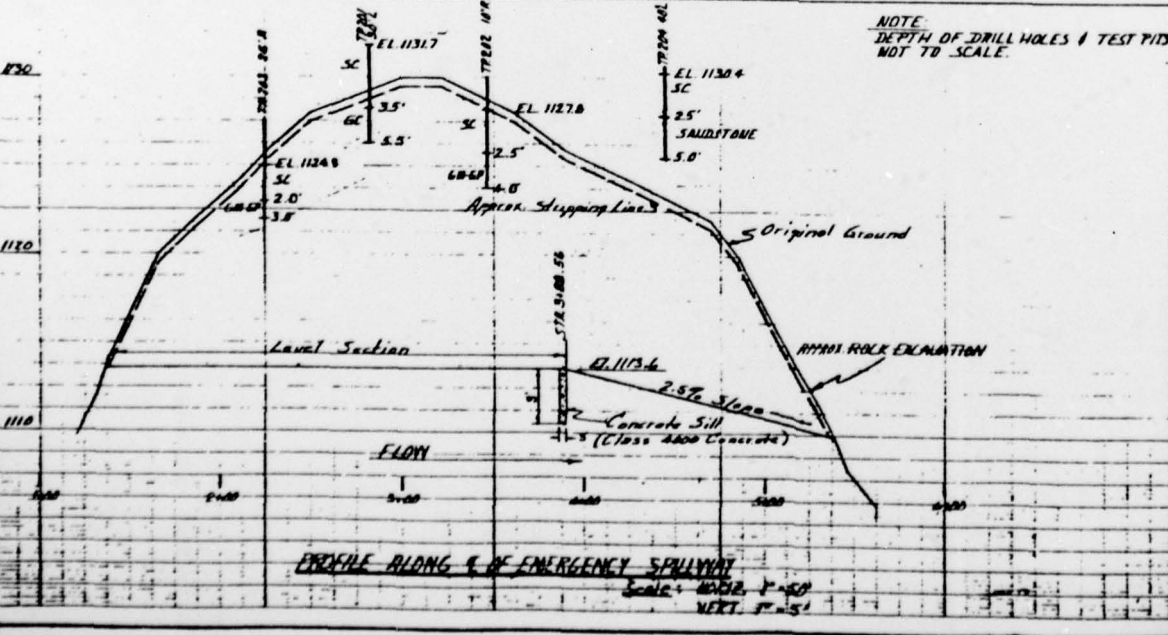
NOTE: PLAN AND PROFILE FOR PRINCIPAL SPILLWAY ARE BASED ON DATA FOR 10" DIA PIPE



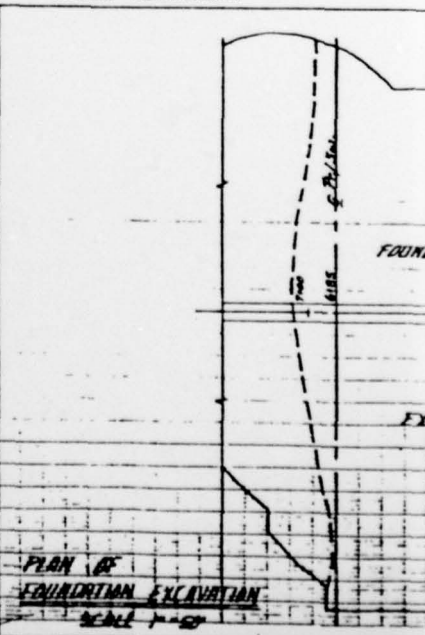
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PROFILE ALONG E OF DAM  
LOOKING DOWNSTREAM



PROFILE ALONG E OF EMERGENCY SPILLWAY  
Scale: HORIZ. 1"=50'  
VERT. 1"=5'



PLAN OF  
FOUNDATION EXCAVATION  
Scale 1"=50'

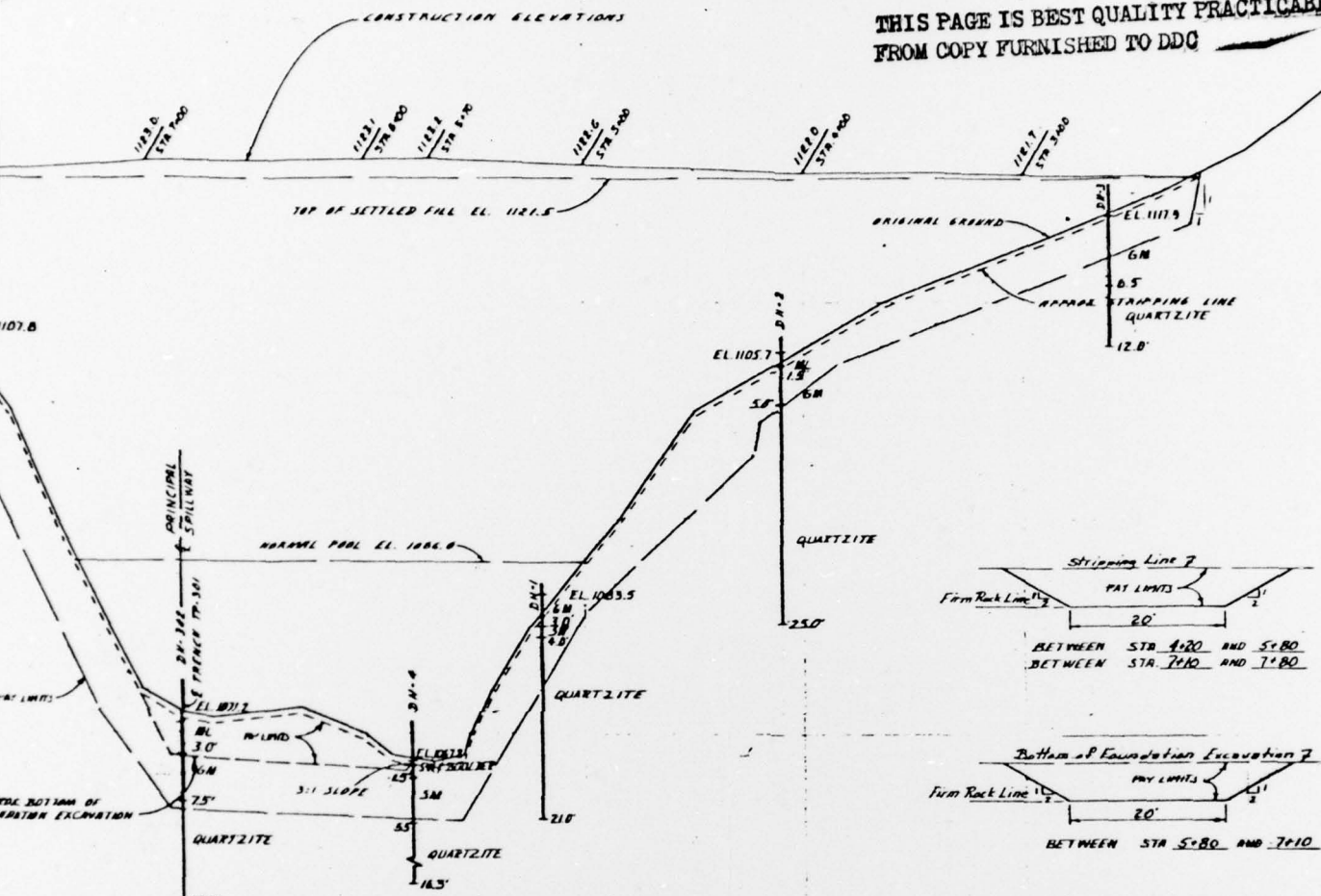


7+00 8+00 9+00 10+00 11+00 12+00

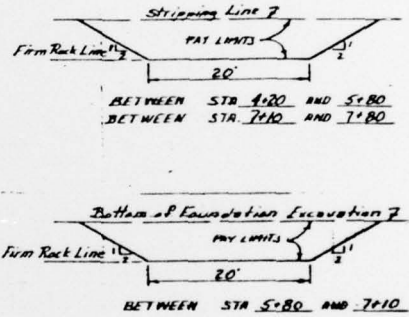
DAM STATIONS - & CUT-OFF TRENCH STATIONS

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ABLE



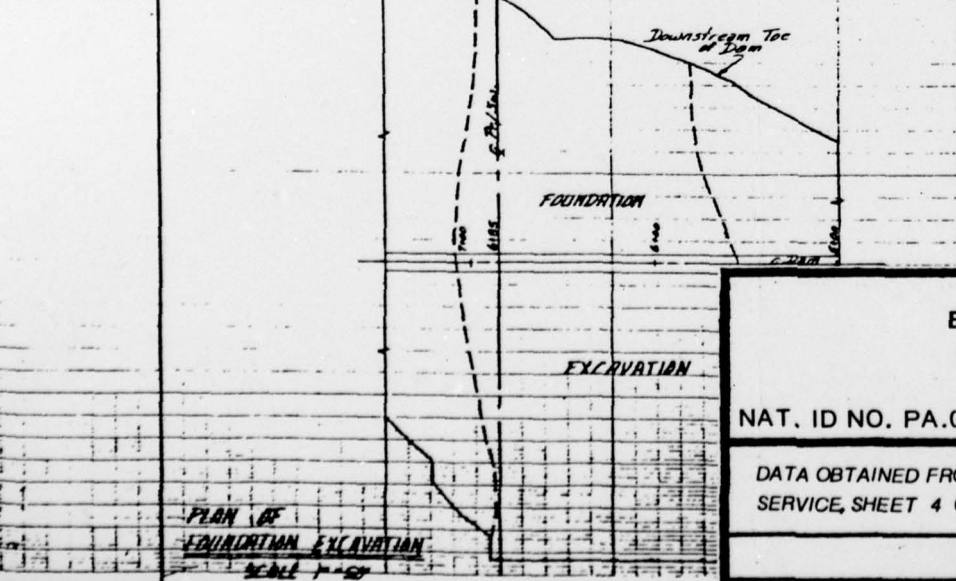
PROFILE ALONG E OF DAM  
LOOKING DOWNSTREAM  
Scale Vert. 1"=8'  
Horiz. 1"=40'



TYPICAL SECTIONS OF CUT-OFF TRENCH

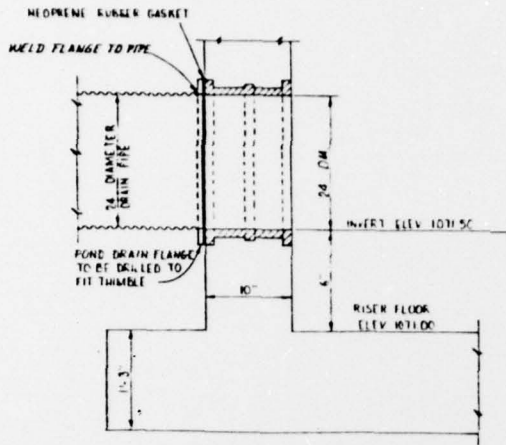
FOR LISTS OF DRILL LOGS AND TEST PITS  
SEE SHEETS 12, 14, 17

HOLES & TEST PITS



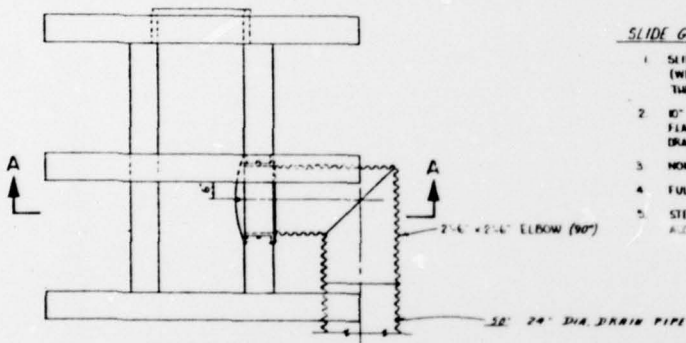
PLAN OF  
FOUNDATION EXCAVATION  
SCALE 1"=40'

|  |                   |
|--|-------------------|
| <b>EMERGENCY SPILLWAY<br/>NEIFERT CREEK DAM</b>  |                   |
| NAT. ID NO. PA.00654   | SCHUYLKILL COUNTY |
| DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION<br>SERVICE, SHEET 4 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966 |                   |
| 2  | PLATE 5           |



POND DRAIN GATE THIMBLE

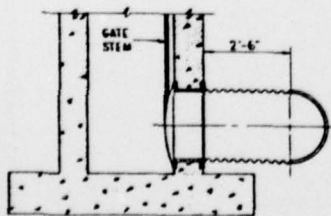
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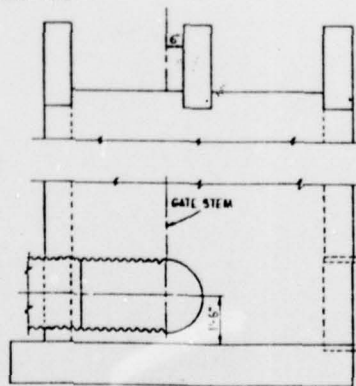
TOP PLAN

SLIDE GATE NOTES

1. SLIDE GATE - 24" DIA. FLANGE BACK, 5'-20" SELF-CONTAINED (WEIGHT OF GATE DURING RAISING AND LOWERING TAKEN BY THE GATE FRAME.)
2. 8" DEEP, TYPE "E" WALL THIMBLE ROUND OPENING, ROUND FLANGE DRILLED AND TAPPED TO FIT GATE FRAME AND POND DRAIN FLANGE.
3. NON-RISING STEM - THREADED PORTON BRONZE
4. FULLY ADJUSTABLE STEM GUIDES
5. STEM, STEM GUIDES AND LIFTING DEVICE SIZED AND SPACED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.



SECTION A-A



SIDE ELEVATION

POND DRAIN OUTLET DETAILS

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20 SELF-CONTAINED  
LOWERING TAKEN BY

OPENING ROUND  
IE FRAME AND POND

SECTION

IE SIZED AND SPACED  
INDICATIONS



POND DRAIN SECTIONS  
NEIFERT CREEK DAM

NAT. ID NO. PA.00654

SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION  
SERVICE, SHEET 11 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

PLATE 6

2

Logged by: H. Marien 1/21/65  
Drilling Equipment: Acker TD-111B

| Hole Depth<br>From To | Description of Materials   | Unif. Soil Class Symb. | STANDARD PENETRATION |               | SAMPLES |             |        |
|-----------------------|--|------------------------|----------------------|---------------|---------|-------------|--------|
|                       |  |                        | Blows Per 6"         | Type Bit Used | No.     | From To Ft. | % Rec. |
| 0.0 0.4               | Forest litter, topsoil, etc.   |                        | 2-2                  | Sp            | 1       | 0.0 1.5     | 70     |
| 0.4 4.1               | Gravel, sandy and silty, brownish, red, moist, 2% low plastic fines, 2% pebbly gravel, well graded, subangular gravel which is weathered quartzite. Coarse crystalline.  | GL                     | 13-17                | Sp            | 2       | 1.5 3.0     | 70     |
| 4.1 4.9               | Quartzite, weathered, red, moist, 15% well graded sand, trace of gravel and silt.  | SW                     |                      | IX            | 3       | 3.0 5.0     | 70     |
| 4.9 5.9               | Quartzite, weathered, coarse to med. grained, grn with red-brn and whit, slight indications of bedding in places, pieces from 0.1' to 1.0' long were recovered, breaks occurred along bedding, broken top at 6.0' (0.1' solution cavity Quartz) at 5.0', (quartzite is very compact and breaks are probably due to us - 0.1' long, 2' long particles within quartzite range from 0.1' to 1.0' very fine sand and are well graded. Sorting has occurred in some places very durable).   |                        |                      |               | 6       | 5.0 10.0    | 100    |
| 5.9 8.9               | Quartzite, med. to fine grained, grn and whit, cross bedding and bedding apparent, beds are from 0.25' to 0.01' in thickness, generally become finer and thinner with depth, pieces from 0.1' to 1.0' long recovered, one solution vein 0.1' thick at 1.5', several fractures with evidence of staining, both fractures and breaks occurred either along bedding planes or at angles of 2 degrees with side of core, not weathered, compact, very durable, no gravel size particles, less than 10% coarse sand, occasional sorted beds, hardness of 6 - apparent dip - 22 degrees. |                        |                      |               | 7       | 10.0 16.0   | 100    |
| 8.9 13.8              | Quartzite, coarse to very coarse grained, conglomerate 0.01' solution vein, staining along beds, fracture at 2 degrees angle to side of core, pieces from 0.5' to 1.0' long, grn, brn-red and whit, break stained, about 8% coarse particles, no voids apparent.   |                        |                      |               | 8       | 16.0 21.0   | 100    |
| 13.8 14.6             | Quartzite, med. to fine grained, grn and whit with some brn-red. Cross-bedding and bedding apparent, beds from 0.1' to 1.0' long, fractured and broken at angle less than 4 degrees, red staining along breaks and fracture, trace of gravel size particles.   |                        |                      |               | 9       | 21.0 22.0   | 100    |

DI 2, ELEV. 1115.7, +10, Centerline  
Logged by: H. Marien 10/22/65  
Drilling Equipment: Acker TD

| Hole Depth<br>From To | Description of Materials   | Unif. Soil Class Symb. | STANDARD PENETRATION |               | SAMPLES |             |        |
|-----------------------|--|------------------------|----------------------|---------------|---------|-------------|--------|
|                       |  |                        | Blows Per 6"         | Type Bit Used | No.     | From To Ft. | % Rec. |
| 0.0 0.3               | Forest litter, roots, etc.   |                        | 1-3-4                | Sp            | 1       | 0.0 1.5     | 70     |
| 0.3 1.5               | Silt, sandy, brownish-red, moist, root, hairs, trace of gravel, 15% well graded sand, (from bedrock)   | ML                     | 7-11-13              | Sp            | 2       | 1.5 3.0     | 70     |
| 1.5 5.9               | Gravel, sandy and silty, brownish-red, moist, weathered quartzite, trace of cobbles, 25% sand, 2% low to med. plastic fines, 5% gravel.  | G                      | 22-31-51             | Sp            | 3       | 3.0 5.0     | 70     |
| 5.9 7.9               | Quartzite, weathered and broken, reddish-grn, pieces from 0.05' to 0.2' recovered, no definite fracture planes.  |                        |                      | Dia.          | 4       | 5.0 10.0    | 70     |
| 7.9 11.5              | Quartzite, med. grained, approximately 10% coarse grained, slight crossbedding, grn to white and red, 0.05' thick quartz solution vein at 9.2'-10.5' at 15 degrees to core, 30% voids, another vein 0.01' thick from 11.2-12.4' at 15 degree angle to core, 30% void space, pieces vary from 0.1' to 0.8' in length being broken either at right angles or at 30% to core, some staining of fractures hardness of 6. |                        |                      |               | 5       | 10.0 14.0   | 100    |
| 11.5 15.9             | Quartzite conglomerate, red to white and grn, broken into 0.05' to 0.1' pieces, badly broken 0.3' zone at 15.4', some voids left unfilled (packing poor), sorted hardness of approximately 6.  |                        |                      |               | 6       | 14.0 18.2   | 100    |
| 15.9 24.5             | Quartzite, med. to fine grained, crossbedded, grn to white (a little red), pieces 0.2' to 2.0' long, fractured zone 22.5 to 23.0', some staining of fractures, fractures mostly horizontal, apparent dip 27 degrees, crossbedded at 45 degrees.  |                        |                      |               | 7       | 18.2 20.3   | 100    |
| 24.5 25.0             | Quartzite conglomerate, red to white with grn, one break at 30 degrees to core, tight packed, durable.   |                        |                      |               | 8       | 20.3 25.0   | 72     |

DI 3, ELEV. 1117.9, 2+61, Centerline  
Logged by: H. Marien 10/25/65  
Drilling Equipment: Acker TD

| Hole Depth<br>From To | Description of Materials  | Unif. Soil Class Symb. | STANDARD PENETRATION |               | SAMPLES |             |        |
|-----------------------|---|------------------------|----------------------|---------------|---------|-------------|--------|
|                       |   |                        | Blows Per 6"         | Type Bit Used | No.     | From To Ft. | % Rec. |
| 0.0 0.5               | Forest litter, roots, etc.  |                        | 3-2-3                | SpT           | 1       | 0.0 1.5     | 70     |
| 0.5 4.5               | Gravel, sandy & silty, brownish red, moist, 25% low to med. plastic fines, 25% well graded sand, 50% gravel composed of sandstone and siltstone, subangular impervious, trace of cobbles. | GH                     | 1-1-1                | Sp            | 2       | 1.5 3.0     | 20     |
| 4.5 6.5               | Gravel, silty and sandy, brownish red, moist, 2% low plastic fines, 15% sand, 65% subangular to angular gravel, composed of siltstone, sand quartzite and siltstone                       | GH                     | 13-21-20             | Sp            | 3       | 3.0 4.5     | 15     |
|                       |   |                        | 25-40-50             | Sp            | 4       | 4.5 6.0     | 70     |
|                       |   |                        | 75                   | Dia.          | 5       | 6.0 6.5     | 40     |
|                       |   |                        |                      |               |         | 6.5 8.0     | 85     |
|                       |   |                        |                      |               |         | 8.0 9.9     | 85     |
|                       |   |                        |                      |               |         | 9.9 12.0    | 100    |

Continued

Cont'd

|           |  |  |  |  |  |  |  |
|-----------|--|--|--|--|--|--|--|
| 6.5 7.0   | Quartzite, med. grained, well graded, tan to white, vague bedding, 0.5' long   |  |  |  |  |  |  |
| 7.0 10.8  | Quartzite, med. to fine grained, red, to greyish red, vague bedding, 0.1' to 1.0' long, broken and weathered near top, unweathered below 8.0', well graded, break into pieces 1.0' to 0.5' in length. Along bedding, siltstone, coarse grained, sorted, bedded, grn with some red, porous, orange 0.1' to 0.5' long. |  |  |  |  |  |  |
| 10.8 11.0 | Quartzite, med. to fine grained, reddish brn, grades into tan at 12.0', bed long, dk. brn-blk, staining, broken along bedding.   |  |  |  |  |  |  |

DI 4, ELEV. 1062.2, Centerline, 5-70C  
Logged by: H. Marien 11/26/65  
Drilling Equipment: Acker TD

| Hole Depth<br>From To | Description of Materials   | Unif. Soil Class Symb. | STANDARD PENETRATION |               | SAMPLES |             |        |
|-----------------------|--|------------------------|----------------------|---------------|---------|-------------|--------|
|                       |  |                        | Blows Per 6"         | Type Bit Used | No.     | From To Ft. | % Rec. |
| 0.0 1.0               | Sand with gravel, brn, wet, trace fine SW  |                        | 9-11                 | Sp            | 1       | 0.0 1.0     | 70     |
| 1.0 1.5               | oulder, had to core.   |                        | 7-7-8                | SpT           | 2       | 1.0 1.5     | 70     |
| 1.5 5.5               | Sand with silt and gravel, brn, wet, low plastic fines, 15% well graded gravel, trace of cobbles, sand is well graded, med. to fine.   | SW                     | 39-30-26             |               | 3       | 1.5 5.5     | 70     |
| 5.5 10.5              | Quartzite, coarse grained, grn to white to gry, no bedding, breaks horizontal, pieces from 0.1 to 0.0', fractures with staining at 20 degrees to core, tan from 9.0 to 10.0', average piece 0.4' long.   |                        | 47-79                | Dia.          | 4       | 5.5 10.5    | 100    |
| 10.5 12.2             | Quartzite, coarse grained, grn with streaks of red, red siltstone interbedded - can be scratched easily with fingernail. Fracture at 45 degrees to core, heavy staining, pieces from 0.05' to 0.6' long, average 0.3', badly broken below 11.8', siltstone and fracture at 11.0' and 10.7', no definite bedding, siltstone deformed. |                        |                      |               | 5       | 10.5 12.2   | 100    |
| 12.2 14.0             | Quartzite, med. grained, grn with white and red specks, fracture at 20 degrees to core, pieces from 0.1' to 0.4' long, average 0.2', slight staining along fracture.   |                        |                      |               | 6       | 12.2 14.0   | 100    |
| 14.0 16.4             | Quartzite, grn, fine grained, bedded with slight crossbedding, one fracture 25 degree angle to core, stained, pieces from 1.7' to 4.2' long, durable.  |                        |                      |               | 7       | 14.0 16.4   | 100    |
| 16.4                  | Bottom of hole. (11/22/65) 0.0'  |                        |                      |               | 8       | 16.4        | 100    |

DI 5, ELEV. 1116.5, 8+40, Centerline  
Logged by: H. Marien 11/4/65  
Drilling Equipment: Acker TD

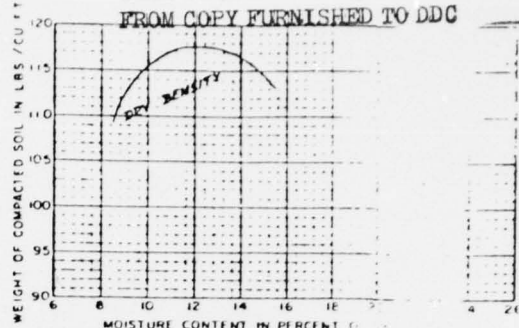
| Hole Depth<br>From To | Description of Materials   | Unif. Soil Class Symb. | STANDARD PENETRATION |               | SAMPLES |             |        |
|-----------------------|--|------------------------|----------------------|---------------|---------|-------------|--------|
|                       |  |                        | Blows Per 6"         | Type Bit Used | No.     | From To Ft. | % Rec. |
| 0.0 0.4               | Forest litter, topsoil, etc.   |                        | 1-4-7                | SpT           | 1       | 0.0 0.4     | 70     |
| 0.4 2.0               | Sand, gravelly, lt. brn, moist, 15% low plastic fines, 15% fine subrounded gravel (quartzite), sand is well graded.  |                        | 47                   | Dia.          | 2       | 0.4 2.0     | 100    |
| 2.0 25.8              | Quartzite, med. to coarse, greenish with red and white particles, badly broken to 18.0', broken to fine gravel, in places weathered, heavy staining, black and orange along fractures, fractures at 20 degrees, and 75% to core, vague bedding of pieces from 0.05' to 0.3' long, average 0.1', thin tan sandstone layers above 18.0', pieces greater than 0.2' in length below 18.0', average 0.8' in length, vertical fractures above 21.0', core becomes more red and has red siltstone inclusion at 24.0', siltstone can be scratched with a knife, quartzite can be too, but with difficulty. |                        |                      |               | 3       | 2.0 25.8    | 100    |
| 25.8 29.0             | Quartzite, med. grained, reddish gry, bedded and crossbedded, vertical fractures and heavy dk. gry staining, pieces average 1' long, 27.5' siltstone lenses appear 0.02' thick. Two can be scratched easily with knife, dip of 8 degrees, gradational contact.   |                        |                      |               | 4       | 25.8 29.0   | 100    |
| 29.0 34.0             | Quartzite, fine grained, brn-red, bedding not apparent, fractures show dk. gry and blue black staining, crossbedded, pieces slightly micaceous, average 1.0' long, badly broken below 33.0' and interbedded with weathered siltstone, pieces there are disks 0.05' thick, can be scratched only with knife, breaks along dip, dip of 8 degrees, distinct contact.  |                        |                      |               | 5       | 29.0 34.0   | 100    |
| 34.0 37.6             | Quartzite conglomerate, coarse grained, approximately 35% particles larger reddish gry, crossbedded, fractures horizontal, pieces from 0.1' to 1.5' to dk. gry and tan, med. staining along fractures, interbedded with siltstone broken and weathered.  |                        |                      |               | 6       | 34.0 37.6   | 100    |
| 37.6 50.0             | Sandstone, med. to fine grained, slightly (5%) micaceous, red-brn except for 45.0 to 45.6', and 27.0 to 47.2' where it is gry grn, pieces from 0.4' to 2.0', slight staining along fractures, fractures and breaks at 80 degree crossbedding, red with white conglomerate zone from 47.9 to 48.3', no voids only with knife. (11/5/65) 21.3'   |                        |                      |               | 7       | 37.6 50.0   | 100    |

DI 6, ELEV. 1107.8, 7+86, Centerline  
Logged by: H. E. Marien 11/23/65  
Drilling Equipment:

| Hole Depth<br>From To | Description of Materials   | Unif. Soil Class Symb. | STANDARD PENETRATION |               | SAMPLES |             |        |
|-----------------------|--|------------------------|----------------------|---------------|---------|-------------|--------|
|                       |  |                        | Blows Per 6"         | Type Bit Used | No.     | From To Ft. | % Rec. |
| 0.0 0.5               | Forest litter, roots, etc.   |                        |                      | Dia.          | 1       | 0.0 0.5     | 100    |
| 0.5 4.5               | Sands, silt and gravel, earth boring to 4.5'   |                        |                      |               | 2       | 0.5 4.5     | 100    |
| 4.5 14.0              | Quartzite, med. grained, grn-grn, red siltstone inclusions 7.0-8.0', badly broken above 11.0' into gravel, orange and black staining, vague crossbedding. (11/24/65) 14.0' |                        |                      |               | 3       | 4.5 14.0    | 100    |



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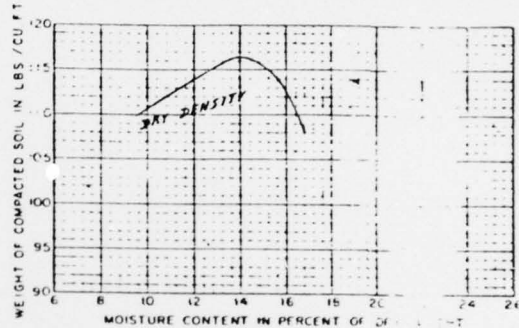


COMPACTION CURVE

LABORATORY SAMPLE NO. 66N100 (SC)

ASTM DESIGNATION D-498 METHOD A

SOIL SIMILAR TO TP-117, DEPTH 0.6' TO 6.5'  
(TESTED FOR PP-422, TRAIL DEPTH 10' TO 4.5')

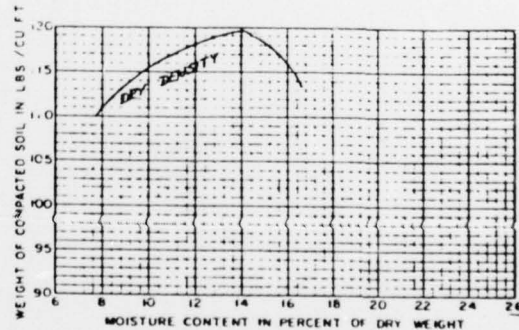


COMPACTION CURVE

LABORATORY SAMPLE NO. 66N1902 (GM)

ASTM DESIGNATION D-498 METHOD A

TP-113 DEPTH 10' TO 10.5'



COMPACTION CURVE

LABORATORY SAMPLE NO. 66N1903 (SC)

ASTM DESIGNATION D-498 METHOD A

SOIL SIMILAR TO TP-120 DEPTH 0.6' TO 8.0'  
(TESTED FOR PP-422, TP-152, DEPTH 10' TO 3.5')

TYPICAL SOIL DATA DETAILS

NEIFERT CREEK DAM

NAT. ID NO. PA.00654

SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE, SHEET 13 OF 15, DRAWING NO. PA-422A-P, DATED APRIL 1966

med. grained, well graded, tan to white, vague bedding, 0.5' long piece, may be cobble.  
med. to fine grained, red, to grayish red, vague bedding, 0.1' lens of coarse sand-  
0.2', badly broken and weathered near top, unweathered below 8.0', mud stain at 7.7',  
red, breaks into pieces 0.5' to 0.5' in length. Along bedding, slight staining.  
coarse grained, sorted, bedded, gray with some red, porous, orange staining, pieces  
1.5' long.  
med. to fine grained, reddish brn, grades into tan at 12.0' bedded, 2 pieces 0.2'  
brn-blk, staining, broken along bedding.

Centerline 5-72  
Date 11/26/65  
Locker

| Unif. Soil Class Symb.   | STANDARD PENETRATION Blows Per 6" | Type Bit Used |      | SAMPLES  |        |        |     |
|--|-----------------------------------|---------------|------|----------|--------|--------|-----|
|  |                                   | No.           | Type | From Ft. | To Ft. | % Rec. |     |
| gravel, brn, wet, trace fines SW   | 9-41                              | SpT           | 1    | Jar      | 0.0    | 1.0    | 30  |
| cobbles, 20% gravel.   |                                   |               |      |          | 1.0    | 1.5    | 6   |
| had to core.   | 7-7-8                             | SpT           | 2    | "        | 1.5    | 3.0    | 60  |
| silt and gravel, brn, wet, 24  | 39-30-26                          | "             | 3    | "        | 3.0    | 4.5    | 55  |
| plastic fines, 15% well graded   | 47-79                             | "             | "    | "        | 4.5    | 5.5    | 0   |
| trace of cobbles, sand is well   |                                   | Dia.          |      | NDM      | 5.5    | 9.0    | 65  |
| med. to fine.  |                                   | "             |      | Red.     | 9.0    | 11.8   | 100 |
| coarse grained, grn to white   |                                   |               |      |          | 11.8   | 14.4   | 92  |
| no bedding, breaks horizontal,   |                                   |               |      |          | 14.4   | 21.3   | 100 |
| from 0.1 to 0.6', fractures with   |                                   |               |      |          |        |        |     |
| at 20 degrees to core, tan from  |                                   |               |      |          |        |        |     |
| 0.0', average piece 0.4' long.   |                                   |               |      |          |        |        |     |
| coarse grained, grv with   |                                   |               |      |          |        |        |     |
| of red, red siltstone inter-   |                                   |               |      |          |        |        |     |
| can be scratched easily with   |                                   |               |      |          |        |        |     |
| fracture at 45 degrees to  |                                   |               |      |          |        |        |     |
| gray staining, pieces from 0.05'   |                                   |               |      |          |        |        |     |
| long, average 0.1', badly broken   |                                   |               |      |          |        |        |     |
| 8', siltstone and fracture at 11.0'  |                                   |               |      |          |        |        |     |
| , no definite bedding, siltstone deformed.                                   |                                   |               |      |          |        |        |     |
| med. grained, grn with white and red specks, fracture at 20 degrees to core  |                                   |               |      |          |        |        |     |
| from 0.5' to 0.4' long, average 0.4', slight staining along fractures.       |                                   |               |      |          |        |        |     |
| grv, fine grained, bedded with slight crossbedding, one fracture at 16.0' at |                                   |               |      |          |        |        |     |
| angle to core, stained, pieces from 1.7' to 0.2' long, durable.              |                                   |               |      |          |        |        |     |
| hole 0.0' (11/2/65) 0.0'   |                                   |               |      |          |        |        |     |

Centerline  
Date 11/24/65  
Locker E

| Unif. Soil Class Symb.  | STANDARD PENETRATION Blows Per 6" | Type Bit Used |      | SAMPLES  |        |        |     |
|---|-----------------------------------|---------------|------|----------|--------|--------|-----|
|   |                                   | No.           | Type | From Ft. | To Ft. | % Rec. |     |
| clay, topsoil, etc.   | 1-4-7                             | SpT           | 1    | Jar      | 0.0    | 1.5    | 90  |
| avelly, lt. brn, moist, 15%   | 97                                | "             | 2    | "        | 1.5    | 2.0    | 60  |
| tic fines, 15% fine subrounded  |                                   | Dia.          | 1    | NDM      | 2.0    | 4.0    | 75  |
| quartzite), sand is well  |                                   | "             | 2    | "        | 4.0    | 5.5    | 61  |
|   |                                   | "             | 3    | "        | 5.3    | 8.0    | 30  |
|   |                                   | "             | 4    | "        | 8.0    | 11.6   | 50  |
|   |                                   | "             | 5    | "        | 11.6   | 14.4   | 79  |
|   |                                   | "             | 6    | "        | 14.4   | 16.6   | 100 |
|   |                                   | "             | 7    | "        | 16.6   | 21.0   | 100 |
|   |                                   | "             | 8    | "        | 21.0   | 26.0   | 98  |
|   |                                   | "             | 9    | "        | 26.0   | 30.0   | 100 |
|   |                                   | "             | 4    | "        | 30.0   | 32.0   | 4   |
| med. to coarse, greenish  |                                   |               |      |          |        |        |     |
| and white particles, badly  |                                   |               |      |          |        |        |     |
| to 18.0', broken to fine gravel,  |                                   |               |      |          |        |        |     |
| weathered, heavy staining,  |                                   |               |      |          |        |        |     |
| orange along fractures,   |                                   |               |      |          |        |        |     |
| at 20 degrees, and 75' to   |                                   |               |      |          |        |        |     |
| vague bedding of pieces from 0.05'  |                                   |               |      |          |        |        |     |
| long, average 0.1', thin tan  |                                   |               |      |          |        |        |     |
| layers above 18.0', pieces  |                                   |               |      |          |        |        |     |
| than 0.2' in length below 18.0',  |                                   |               |      |          |        |        |     |
| 0.8' in length, vertical fractures  |                                   |               |      |          |        |        |     |
| 0.0', core becomes more red and has   |                                   |               |      |          |        |        |     |
| stone inclusion at 24.0', siltstone can be  |                                   |               |      |          |        |        |     |
| scratched with a knife, quartzite can be too, but                                       |                                   |               |      |          |        |        |     |
| difficulty.   |                                   |               |      |          |        |        |     |
| med. grained, reddish gray, bedded and  |                                   |               |      |          |        |        |     |
| bed, vertical fractures and heavy dk. gray  |                                   |               |      |          |        |        |     |
| pieces average 1' long, 27.5' siltstone   |                                   |               |      |          |        |        |     |
| appear 0.02' thick. Two can be scratched  |                                   |               |      |          |        |        |     |
| with knife, dip of 8 degrees, gradational   |                                   |               |      |          |        |        |     |
| fine grained, brn-red, bedding not  |                                   |               |      |          |        |        |     |
| fractures show dk. gray and blue black  |                                   |               |      |          |        |        |     |
| crossbedded, pieces slightly micaceous,   |                                   |               |      |          |        |        |     |
| 0.0' long, badly broken below 33.0' and inter-  |                                   |               |      |          |        |        |     |
| with weathered siltstone, pieces there are disks  |                                   |               |      |          |        |        |     |
| ick, can be scratched only with knife, breaks   |                                   |               |      |          |        |        |     |
| o, dip of 8 degrees, distinct contact.  |                                   |               |      |          |        |        |     |
| conglomerated, coarse grained, approximately 35% particles larger than sand size,       |                                   |               |      |          |        |        |     |
| gray, crossbedded, fractures horizontal, pieces from 0.1' to 1.5' long, average 0.8',   |                                   |               |      |          |        |        |     |
| and tan, med. staining along fractures, interbedded with siltstone at 37.6', here it is |                                   |               |      |          |        |        |     |
| nd weathered.   |                                   |               |      |          |        |        |     |
| med. to fine grained, slightly (5%) micaceous, red-brn except from 41.7 to 42.7',       |                                   |               |      |          |        |        |     |
| 45.6', and 27.0 to 47.2' where it is gray grn, pieces from 0.4' to 4.0' long, average   |                                   |               |      |          |        |        |     |
| light staining along fractures, fractures and breaks at 80 degree to core, slight       |                                   |               |      |          |        |        |     |
| dip, red with white conglomerate zone from 47.9 to 48.3', no voids, can be scratched    |                                   |               |      |          |        |        |     |
| with knife. WL (11/5/65) 21.3'  |                                   |               |      |          |        |        |     |

Centerline  
Date 11/23/65

| Unif. Soil Class Symb.                         | Type Bit Used | SAMPLES |      |        |      |    |
|--|---------------|---------|------|--------|------|----|
|  |               | No.     | Type | % Rec. |      |    |
| litter, roots, etc.                            | Dia.          | 1       | NDM  | 4.5    | 6.5  | 45 |
| silt and gravel, earth boring to 4.5'          | "             | 2       | "    | 6.5    | 8.5  | 96 |
| med. grained, gray-grn, red siltstone          | "             | 3       | "    | 8.5    | 11.5 | 35 |
| na 7.0-8.0', badly broken above 11.0' into     | "             | 4       | "    | 11.5   | 14.0 | 88 |
| orange and black staining, vague crossbedding, |               |         |      |        |      |    |
| (11/24/65) 14.0'                               |               |         |      |        |      |    |

2

**APPENDIX**

**F**

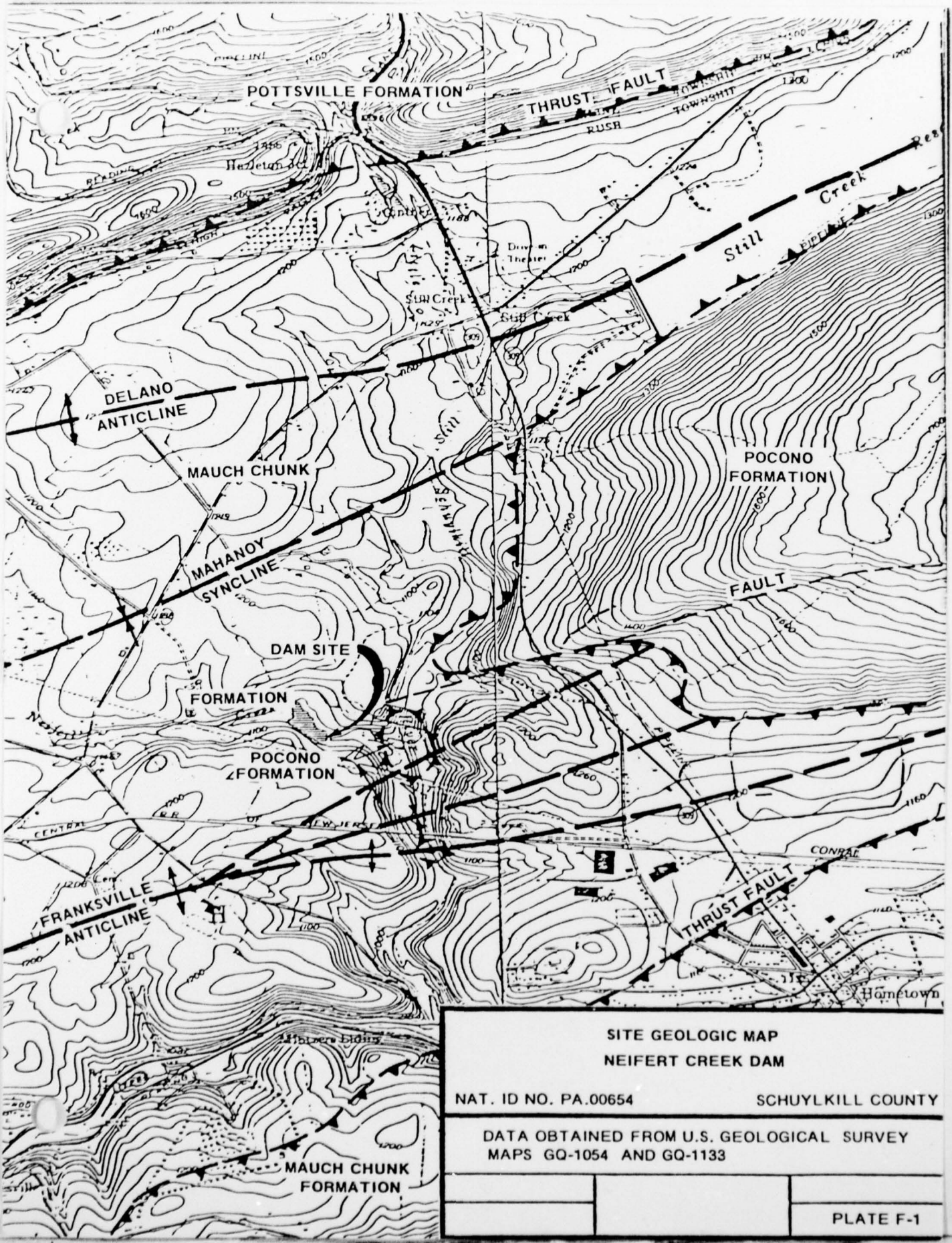
SITE GEOLOGY  
NEIFERT CREEK DAM

Neifert Creek Dam is located in the Appalachian Mountain Section of the Valley and Ridge Physiographic Province. As shown in Plate F-1, the dam is located in the sandstone and shale Mauch Creek Formation of Mississippian age. In the left abutment area, bedrock strikes northwest and dips approximately 15 degrees to the southwest (upstream direction). Jointing strikes east-northeast (perpendicular to dam) with near-vertical dips to the north. Another joint set strikes near north-south with near-vertical dips to the west (upstream direction).

The dam lies between two regional east-northeast trending folds in an area of localized thrust faulting. Several faults occur approximately 1,000 feet to the rear near Little Schuylkill River Dam. One is a low angle thrust fault with an elliptical fault trace due to erosion which formed the present Little Schuylkill River valley. The other fault strikes east-northeast with a sense of movement of down-to-the south.

The combination of northwest striking bedding and east-northeast striking joint planes would be conducive to downstream springs water seeps (as noted by the inflow of water near the north bank of Neifert Creek). Problems of water seepage are not considered to be significant since this dam is a flood control structure and is not expected to be at maximum capacity for extended periods.





**SITE GEOLOGIC MAP**  
**NEIFERT CREEK DAM**

NAT. ID NO. PA.00654 SCHUYLKILL COUNTY

DATA OBTAINED FROM U.S. GEOLOGICAL SURVEY  
 MAPS GQ-1054 AND GQ-1133

|  |  |           |
|--|--|-----------|
|  |  | PLATE F-1 |
|--|--|-----------|