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Coal Combustion Residuals Impoundment Liner Design Certification and Retrofit Plan

Conemaugh Generating Station
Ash Filter Pond A
New Florence, Pennsylvania

GAI Project Number: C190459.04, Task 005

January 2024

Prepared by: GAI Consultants, Inc.
Pittsburgh Office
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Prepared for: Conemaugh Generating Station
1442 Power Plant Road
New Florence, Pennsylvania 15944-9154

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Professional Engineer's Certification

The Retrofit Plan, including liner design, for the Conemaugh Generating Station Ash Filter Pond A was prepared by GAI Consultants, Inc. (GAI). This Professional Engineer's Certification is limited to the information available to GAI at the time the Plan was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the Commonwealth of Pennsylvania that the Plan has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, at the same time, and in the same locale. It is my professional opinion that the liner design is consistent with the requirements of Title 40 of the Code of Federal Regulations (CFR) Section 257.72, as required by Section 257.72(c); that the liquid flow rate through the lower component of the alternative composite liner is no greater than the liquid flow rate through 2 feet of compacted soil with a hydraulic conductivity of 1×10^{-7} centimeters per second, as required by Section 257.70(c)(2); and that the Plan is consistent with the requirements of Section 257.102(k)(2), as required by Section 257.102(k)(2)(iv). These regulatory sections are portions of the United States Environmental Protection Agency's "Disposal of Coal Combustion Residuals from Electric Utilities," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not be interpreted or construed as a guarantee, warranty or legal opinion.

Adam B. Scheller, PE	PE082946
Printed Name of Professional Engineer	Commonwealth of Pennsylvania License Number
Adam Scheller	1/22/24
Signature of Professional Engineer	Date

1.0 Introduction

The Conemaugh Generating Station (Station) is a steam electric generating station located along the Conemaugh River in West Wheatfield Township, Pennsylvania (PA). Four ash filter ponds (AFPs) are located at the Station. The AFPs consist of AFPs A, B, C, and D. All of the AFPs were constructed, and are operated, under a PA Department of Environmental Protection (PaDEP) permit. The AFPs function as settling ponds and are part of the Station's ash water recycle system. During Station operations, bottom ash is sluiced from the ash hoppers to the hydrobins. Overflow and drainage from the hydrobins is then discharged to the AFPs, where the coal combustion residual (CCR) material is permitted to settle. The AFPs were originally constructed with engineered clay liners. Two of the AFPs (B and C) were reconstructed in 2023 with a liner system meeting the requirements specified in Title 40, Part 257, Subpart D of the Federal Regulations (CFR), *Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments* (CCR Rule). AFP A is planned to be retrofitted in 2024 utilizing the same liner system.

2.0 Retrofit Plan

2.1 Retrofit Description

AFP A will be retrofitted in accordance with Section 257.102(k)(1) of the CCR Rule. The retrofit activities will include:

- Removal of CCR that has accumulated in the AFP protective cover system;
- Removal of underlying clay soils that visually appear to have been in contact with CCR; and
- Installation of a liner system that meets the requirements of the CCR Rule. The new liner system will include:
    - Subbase [contaminant resistant (enhanced) geocomposite clay liner (EGCL)].
    - Secondary liner [60-mil textured high-density polyethylene (HDPE) geomembrane].
    - Geocomposite drainage net and perforated pipe collection system.
    - Composite primary liner (EGCL and 60-mil textured HDPE geomembrane).
    - 16 ounce per square yard non-woven cushion geotextile.
    - Protective cover consisting of concrete uniform section mat on the AFP bottom and side slopes.

Material removed from AFP A will be disposed of at the Station's CCR landfill. Removal of accumulated sediment from the AFP is performed periodically as part of normal cleaning and maintenance. This procedure is not considered to be part of the retrofit activities.

2.2 Schedule of Retrofit Activities

AFP A will be taken out of service and reconstructed during 2024. AFP A will be placed back into service immediately following construction. The two ponds retrofitted in 2023, AFPs B and C, will remain in service to maintain normal operations at the Station. Construction of the retrofit activities for AFP A are scheduled to begin in the second quarter of 2024. AFP A retrofit activities are expected to be completed during the 2024 construction season.

2.3 CCR Removal Volume and Area Estimate

Sections 257.102(k)(2)(c) and (d) require estimates of the maximum amount of CCR that will be removed and the maximum area affected as part of the retrofit operation. Soil, aggregate, and sediment are included in the AFP A volume estimate, as they may be intermingled with CCR. The

volumes to be removed were calculated based on the Figure 1 areas of the inner dikes and AFP bottom. The thicknesses of materials to be removed from the AFP bottom include 2.5 feet of bottom ash, 1.5 feet of No. 8 aggregate, and an estimated 6 inches of the clay bottom. The estimated thicknesses of materials to be removed from pond side slopes are 1.5 feet of rock and 6 inches of clay.

The area of the pond affected by the retrofit operation is shown on Figure 2. The estimated volume and area is summarized on Table 1.

Table 1

Estimate of Volume to be Removed and Pond Area to be affected by Retrofit Operations

Ash Filter Pond	CCR and Soils to be Removed (cubic yards)	Pond Area to be Affected (square feet)
A	4,930	71,400

2.4 Retrofit Notifications

In accordance with §257.102(k)(5), the Station will post a notification of intent to initiate retrofit to the operating record prior to the initiation of retrofit activities. This plan will become part of the Station's operating record. Within 30 days of completion of retrofit activities, a notification of completion of retrofit activities, including certification by a qualified professional engineer, will be posted to the operating record, in accordance with §257.102(k)(6). The retrofit plan and applicable notifications will be posted to the Station's publicly accessible internet site.

2.5 Liner Design

Section 257.102(k)(1) requires retrofits to meet liner design criteria of §257.72, which refers to §257.70(c). Under §257.70(c), CCR surface impoundments may be lined with an alternative composite liner which must consist of a geomembrane upper component and a lower component that is not a geomembrane with a liquid flow rate no greater than the liquid flow rate of 2 feet of compacted soil with a hydraulic conductivity of no more than 1 x 10^{-7} centimeters per second. Under the CCR Rule, the liquid flow rate comparison of an alternative composite component, such as an EGCL, to that of compacted soil must be determined based on the equation provided at Section 257.70(c)(2), which includes the hydraulic conductivity of the liner, hydraulic head above the liner, and the thickness of the liner. Based on our calculations, the composite liner for Ash Filter Pond A meets this liquid flow rate comparison. The constructed materials meet the requirements for chemical properties, strength, and side slope shear resistance.

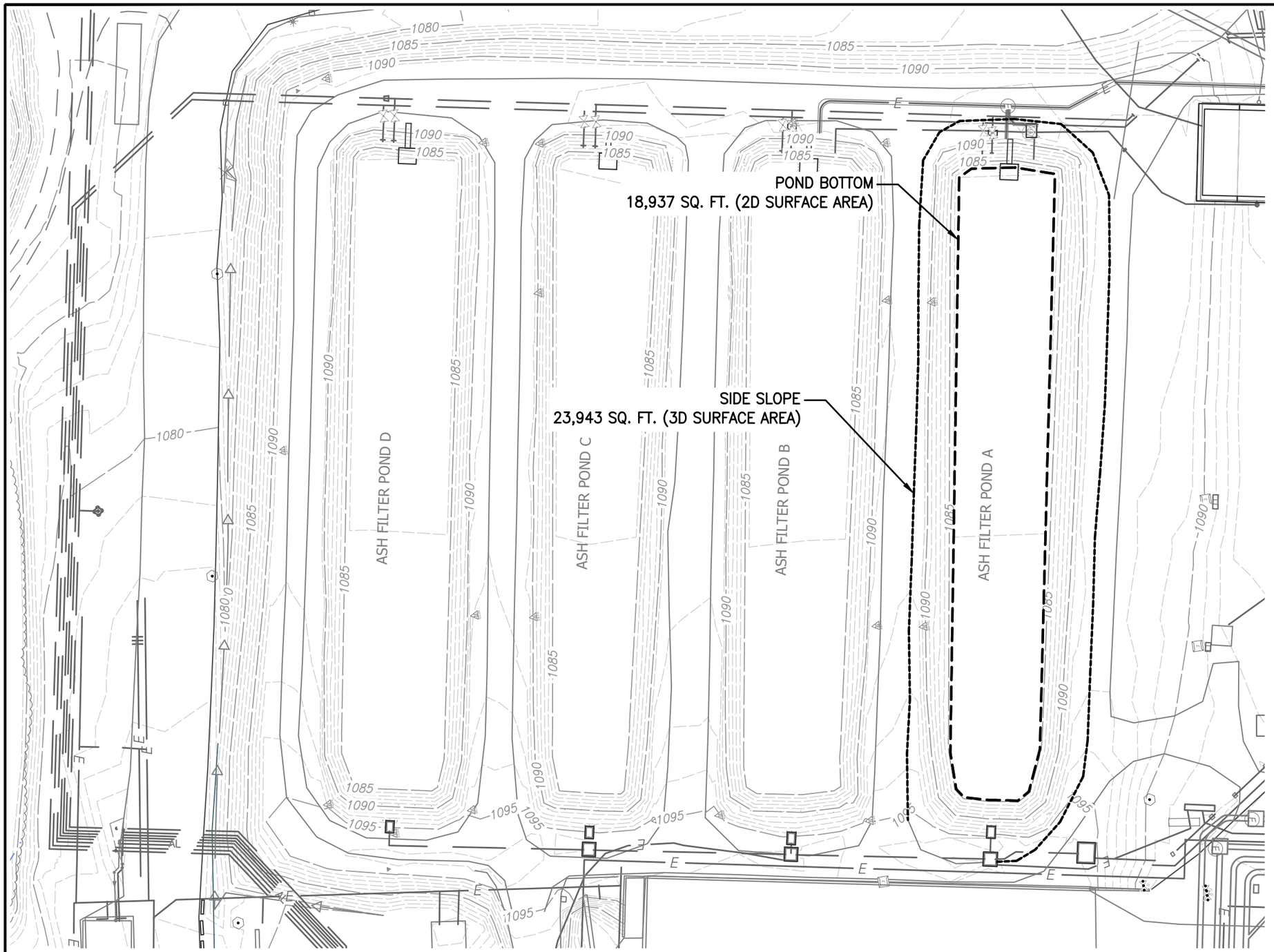
Section 257.72 requires that surface impoundment alternative liners meet the requirements of 257.70(c). In accordance with §257.70(c)(3), the composite liner will be constructed of materials that meet the requirements for chemical properties, strength, and side slope shear resistance; placed upon a foundation providing adequate support; and installed to cover all surrounding earth likely to be in contact with CCR or leachate. In accordance with 257.72(b), dikes will not be constructed on top of the composite liner. Certification from a qualified professional engineer that the alternative composite liner has been constructed in accordance with the applicable regulatory requirements will be provided upon completion of retrofit as required by §257.72(d).

3.0 References

Gilbert Associates, Inc. *New Filter Pond 4 Plan, Sections, and Details (D-782-008).* Prepared for Conemaugh Generating Station. February 1980 (Revision 10 October 1995).

United States Environmental Protection Agency. *40 CFR Parts 257 and 60 Hazardous and Solid Waste Management Disposal System; Disposal of Coal Combustion Residual from Electric Utilities,* Final Rule, April 2015.

FIGURES



MAP REFERENCE:

1. SURFACE TOPOGRAPHY AND FEATURES ARE BASED ON GAI SURVEY, CONDUCTED JANUARY 19 THROUGH JANUARY 31, 2020 AND ON STATION REFERENCE DRAWINGS.

LEGEND:

1020 EXISTING MAJOR CONTOUR

1019 EXISTING MINOR CONTOUR

SCALE: 1" = 60'

60 0 60 120

REFERENCE ONLY

NO.	DATE	REVISIONS	BY	CHK	APP

gai consultants

DATE: 01/19/2024
BY: RHULL
CHK: TBORING
APP: ASCHELLER
SIZE: B
DISCIPLINE: CIVIL
SCALE: AS SHOWN

KeyCon

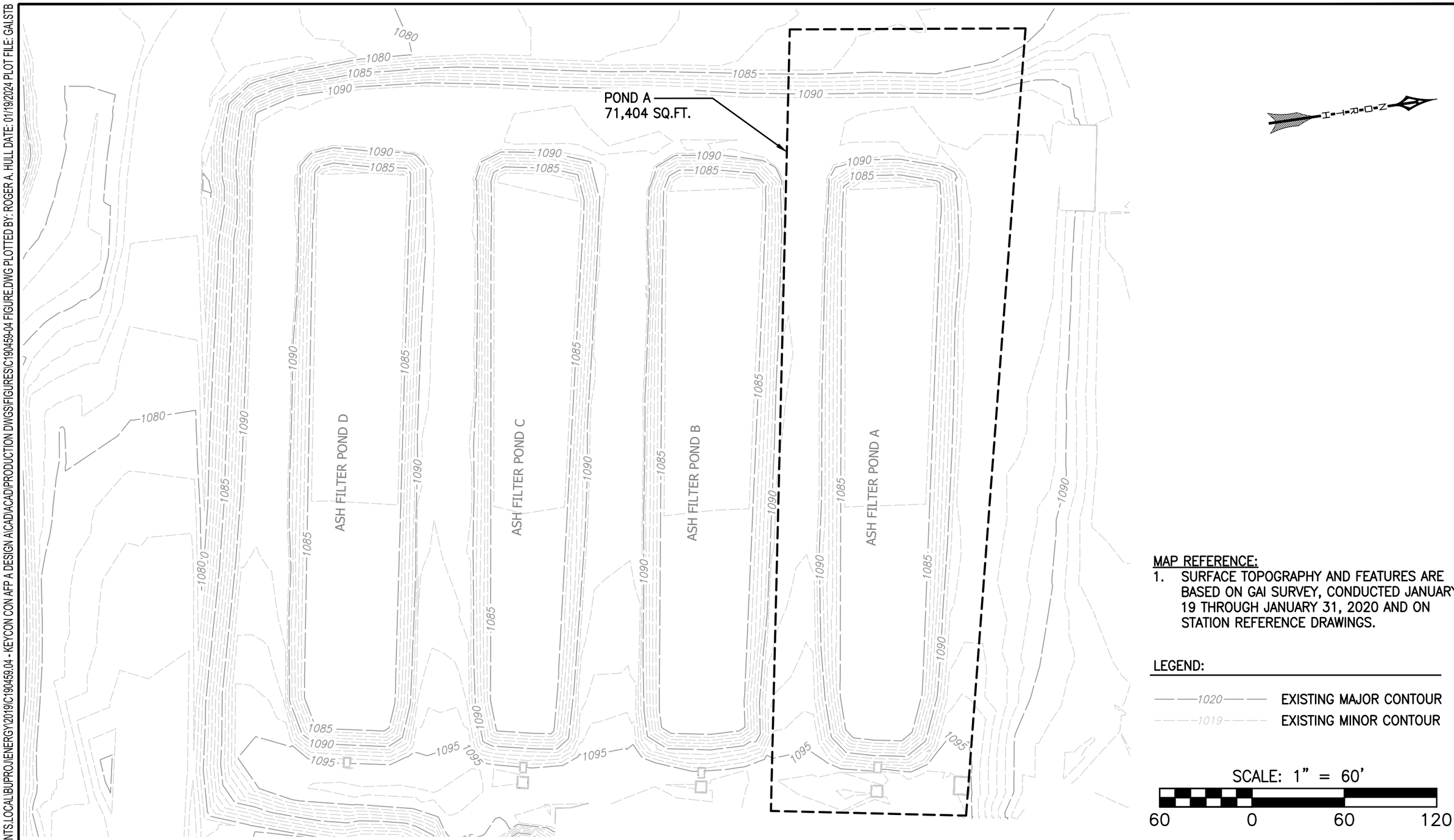
CONEMAUGH GENERATING STATION
NEW FLORENCE, PA

AREAS OF EXCAVATED MATERIAL

ASH FILTER POND A RECONSTRUCTION

DRAWING NO.
FIGURE 1
SHEET: 1 OF 1
REV:
FILE: C190459-04 FIGURE

GAI FILE PATH: \\GAICONSULTANTS.LOCAL\BUPROJ\ENERGY\2019\C190459.04 - KEYCON CON AFP A DESIGN A\CAD\ACAD\PRODUCTION DWGS\FIGURES\C190459-04 FIGURE.DWG PLOTTED BY: ROGER A. HULL DATE: 01/19/2024 PLOT FILE: GAI.STB



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SCALE: AS SHOWN

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CONEMAUGH GENERATING STATION
NEW FLORENCE, PA

POND AREAS DISTURBANCE

ASH FILTER POND A RECONSTRUCTION

DRAWING NO.
FIGURE 1
SHEET: 1 OF 1
REV:
FILE: C190459-04 FIGURE