Daniel Brown

From: donotreply@pa.gov
Sent: Friday, June 24, 2022 4:51 PM
To: Daniel Brown
Cc: RA-EP-ONBASENOT@pa.gov
Subject: [EXTERNAL][RECEIVED] Scanned Forms review - Reference ID: 61118

Dear Daniel Brown,

Thank you for submitting the OTHER form to DEP.

Region: SOUTHCENTRAL REGIONAL OFFICE
County: LANCASTER
Municipality: MANOR TOWNSHIP
Permit #/Project #: 101389
RPCO Reference ID#:

DEP Processing Comments (if any):
"2021 LCSWMA Frey Farm Landfill
Municipal Waste Landfill Annual Operation Report"

We will review the document and associated information and notify you with any concerns.

Your form reference # is 61118. Please use this reference # for future inquiries to DEP and include on the check memo when remitting payment.

The DEP receipt date is 6/24/2022.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

* This is an automated email from OnBase - DO NOT REPLY *

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LCSWMA

1299 HARRISBURG PIKE | LANCASTER, PA 17603
PHONE: 717-397-9968 | FAX: 717-397-9973
www.lcswma.org

June 24, 2022

Mr. Anthony Rathfon, Waste Management Program Manager
Pennsylvania Department of Environmental Protection
Southcentral Region
909 Elmerton Avenue
Harrisburg, PA 17110-8200

RE: **Annual Operation Report for 2021**
Frey Farm Landfill, Permit No. 101389

Dear Mr. Rathfon:

In accordance with the Municipal Waste Management Regulations (Section 273.313) enclosed herein is the Annual Operation Report relating to the above referenced facility.

Enclosed is a check in the required amount of $2,800 for administration fees. If you have any questions or concerns, please do not hesitate in contacting me.

Respectfully submitted,

Daniel A. Brown

Environmental Compliance Manager

Enclosures

cc: LCSWMA: Environmental, J. Ridinger, A. Rice (w/ enclosures)

Bureau of Radiation Protection (page 5, "Summary of Detected Radioactive Materials," only)
P.O. Box 8469
Harrisburg, PA 17105-8469

Office of Energy & Technology Deployment (page 6, Landfill Gas Generation, Recovery, and Beneficial Use Data," only)
Division of Energy Policy & Technology Deployment
P.O. Box 8772, 15th Floor
Harrisburg, PA 17105-8772

2021

PA DEP ANNUAL OPERATION REPORT

for the

FREY FARM LANDFILL

Site Address: 3049 River Road
Conestoga, PA 17516

BWM Permit No. 101389

Submitted by:

Lancaster County Solid Waste Management Authority

1299 Harrisburg Pike

Lancaster, Pennsylvania 17603

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Form

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Date Prepared
06/20/2022

MUNICIPAL WASTE LANDFILL ANNUAL OPERATION REPORT FORM

Permit Number
101389

Instructions: This report is to be completed based on the preceding calendar year. Responses regarding volumes remaining should be based on availability on January 1 of the following year (ex: capacity used would be from January 1, 2001 through December 31, 2001 and remaining capacity would be as of January 1, 2002).

Facility Name: LCSWMA Frey Farm Landfill I.D. No.: Site ID # 450744

For the report period 2021 (January 1 to December 31)
(enter year)

A. FACILITY CAPACITY INFORMATION

1. Permitted Airspace*:	17,037,197	CY
2. Total Airspace Used*:	11,091,666	CY
3. Airspace Used this Report Period*:	437,840	CY
4. Total Airspace Remaining*:	5,945,531	CY
5. Waste Accepted in this Report Period:	406,479	Tons
6. Waste Accepted in Previous Years:	9,897,613	Tons
7. Total Waste Accepted:	10,304,092	Tons

8. Current Conversion Factor:
Current Conversion Factor = *Waste Accepted in this Report Period /Airspace Used this Report Period*
= 0.93 Tons/CY

9. Total Capacity Remaining:
Total Capacity Remaining = *Current Conversion Factor x Total Airspace Remaining*
= 5,519,673 Tons

10. Operating Days This Report Period:	305	Days
11. Average Daily Volume of Waste Accepted**:	1,332.7	Tons

12. Estimated Remaining Life:
Estimated Remaining Life = *Total Capacity Remaining/Avg. Volume of Waste Accepted/#Operating Days*
= 13.6 Years

*All airspace capacity calculations should be based upon actual field survey or aerial mapping.

**Avg. volume of waste accepted = *Waste Accepted in this Report Period/# Operating Days*

B. PERMIT AND OPERATION STATUS

1. Have there been any changes to your compliance information?

☐ NO. If "NO," complete a copy of Form C1 "Compliance History Certification" (2540-PM-BWM0351) and attach it to this report.

☒ YES. If "YES," complete a copy of Form HW-C, "Compliance History" (2540-FM-BWM0058) and attach it to this report.

2. Have there been any changes to your Contractual Consent of Landowner (Form E) or your Compliance History Certification (Form C1)?

   ☒ NO.

   ☐ YES. If "YES," submit a revised copy of Form E, "Contractual Consent of Landowner" (2540-PM-BWM0353). Changes involving land ownership may require the submittal of Part B2 and B3 of Form C1 concerning surface or subsurface land ownership.

3. Operation Update

		This Report Period:		Site Total:	
a.	Acreage used for disposal	16.8	acres	95.74	acres
b.	Acreage seeded	9.3	acres	9.3	acres
c.	Acreage vegetated	9.3	acres	9.3	acres
d.	Acreage permanently vegetated	0	acres	58.6	acres

   e. Attach a narrative description of the progress in implementing the closure plan.

4. Monitoring Plan Evaluation

   Develop and attach an evaluation of the groundwater monitoring plan required under Section 273.282 (relating to number, location and depth of monitoring points). The evaluation should determine if revisions to the groundwater monitoring plan are required due to changes in groundwater elevation, hydrogeologic conditions or other reasons. If this evaluation determines that changes in the approved groundwater monitoring plan are necessary, the operator shall immediately notify the Department and submit an application for permit modification.

   ☐ Revisions are required. Report is attached.

   ☒ Revisions are not required. Report is attached.

5. Radioactive Monitoring

   Attach a summary of detected radioactive materials using the attached form:

   Note to Operator: Forward a copy of the above attachment to:

   Bureau of Radiation Protection,
   P.O. Box 8469,
   Harrisburg, PA 17105-8469

6. Landfill Gas Generation, Recovery, and Beneficial Use Data

   Attach summary of landfill gas generation, recovery, and beneficial use using the attached form:

   Note to Operator: Forward a copy of the above attachment to:

   Office of Energy and Technology Deployment
   Division of Energy Policy & Technology Deployment
   P.O. Box 8772, 15th Floor
   Harrisburg, PA 17105-8772

7. Landfill Benefits Monitoring

   Attach a summary of the landfill benefits for this reporting period with supporting documentation using the attached form. The summary shall identify the approved benefit, the magnitude of the benefit and whether the claimed benefit was realized as anticipated. In the event that a benefit is less than the landfill had anticipated, include an explanation and any proposed corrective action to fulfill the claimed benefit.

C. FINANCIAL ASSURANCE

1. Attach a written update of the total bond liability for the facility in accordance with Section 271.331 (relating to bond and trust amount determination). Bonding worksheets can be found at www.depweb.state.pa.us. If additional bond is determined to be necessary, it shall be submitted to the Department within 90 days after the annual report is due.

   ☒ Additional bond is not required. Attach copy of completed bond calculation worksheets (not bond documents).

   ☐ Additional bond will be submitted. Attach copy of completed bond calculation worksheets (not bond documents).

2. Attach documentation of current certificate of insurance as specified in § 271.374(a) (relating to proof of insurance coverage), proving continuous coverage for public liability insurance as required by § 271.371 (relating to insurance requirement).

D. TOPOGRAPHIC MAP UPDATE

Attach a topographic map of the same scale, contour interval and grid system as the original site plans showing:

1. Contours at the beginning and the end of the report period.
2. The completed areas of the site at final elevation and the areas partially filled, but not active during the report period.
3. Areas that have final cover in place, indicating those areas where final cover was placed during the report period.

E. DRAWINGS

Attach the following:

1. An isopach drawing which clearly identifies the existing elevations as well as the final permitted elevations. These can be shown with (a) different color contour lines or (b) with contours for the existing elevations and the overfill/underfill delineated using a numerical grid.
2. A cross-sectional grid with a 50 foot horizontal interval should be submitted for areas that received waste in the past year. The same cross sections approved in the permit application should be included in the grid, if possible. Each of these cross sections should show the current grades, the grades at the beginning of the report period, the original grades, and the permitted grades. Any areas of overfill should be clearly identified on each cross section, including overfill volumes.
3. The actual field survey or aerial mapping and the calculation used to determine the airspace figures.

2500-FM-BWM0167 1/2015
25 Pa. Code §273.313
Certification

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

CERTIFICATION OF REGISTERED PROFESSIONAL ENGINEER

This is to certify that the Topographic Map and Drawing Updates accurately represent the status of the facility and does not, to the best of my knowledge, withhold information that is pertinent to a determination of compliance with the requirements of the Department. I am aware that there are significant penalties for submitting false information.

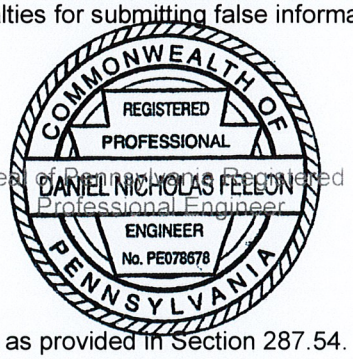
Name Daniel N. Fellon, P.E.
(Please Print)

Signature _____

Date 6/16/2022

Address 1129 W Governor Road; PO Box 797
Hershey, PA 17033

Telephone (717) 533-8600



Seal of Pennsylvania Registered Professional Engineer

F. ALL REQUIRED ANALYSES WERE RECEIVED DURING THE YEAR as provided in Section 287.54.

☒ Yes ☐ No

G. PERMIT ADMINISTRATION FEE

Please submit a check payable to the "Commonwealth of Pennsylvania." Attach the check to one of the copies being sent to the Regional Office.

☒ $2,800.00

Name of Permittee: Lancaster County Solid Waste Management Authority

Facility Name: LCSWMA Frey Farm Landfill

City: Lancaster State: PA Zip: 17603 Phone No.: (717) 397-9968

TAX I.D.: 23-6006036 or SS# ___ - ___ - ___

Officer Certification

This is to certify that I have personally examined this report and am familiar with the information submitted in it and all attached documents. I am aware of the Department of Environmental Protection requirements for this report and this facility. To the best of my knowledge, information and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

Name of Officer Robert B. Zorbaugh
(Please Print)

Signature _____

Title Chief Executive Officer

Date 06/24/2022

Telephone (717) 397-9968

IDENTIFY ALL ATTACHMENTS BY PERMIT NUMBER AND DATE PREPARED.

2500-FM-BWM0167 1/2015
25 Pa. Code §273.313
Certification

Date Prepared: **6/20/2022**

SUMMARY OF DETECTED RADIOACTIVE MATERIALS

Permit Number: **101389**

Date	Isotope Detected (e.g. I-131, Ra-226, etc.)	Maximum Dose Rate On Truck* (microR/hr)	Maximum Dose Rate On Item** if measured (microR/hr)	Description of Waste (tenorm, medical, norm, etc.)	Disposition (Disposed on-site rejected-DOT exemption number, etc.)
12/29/2021	Tech-99m	108 uR/hr		Medical	Disposed

* Surface (2") dose rate on truck
** One foot dose rate on item

Note: Use additional sheets as necessary.
Number of pages included:

2500-FM-BWM0167 Rev. 12/2010
25 Pa. Code §273.313
Attachment

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

LANDFILL GAS COLLECTION AND BENEFICIAL USE DATA

GENERAL INFORMATION

Landfill Name: LCSWMA Frey Farm Landfill
Year Opened: 1989
Permit #: 101389
Owner: Lancaster County Solid Waste Management Authority
Year Closed (anticipated): N/A
Primary Contact: Daniel A. Brown
Title: Environmental Compliance Manager
E-Mail: dbrown@lcswma.org
Website: www.lcswma.org
Site Address: 3049 River Road
City: Conestoga
State: PA
Zip: 17516
County: Lancaster
Municipality: Manor Township
Mailing Address (if different): 1299 Harrisburg Pike, Lancaster, PA 17603
Site Longitude (decimal format): 39.953783402
Site Latitude (decimal format): -76.450426788
Waste In Place (tons): 10,304,092
Max. Capacity (tons): 17,548,313
Annual Acceptance Rate (actual tons): 406,479 (2021 actual)
Potential For Expansion? ☐ Yes ☒ No
Landfill Alternative Names (if applicable): N/A

LANDFILL GAS GENERATION & DISPOSITION

Gas Collection Rate (MMscfy): 363.67 =
Avg. Gas Volume Beneficially Used (MMscfy): 362.67 + Avg. Gas Volume Flared (MMscfy): 0.99
Number of Flares: 2
Number of Gas Wells: 38
Avg. Methane Content (percent): 53.42

LANDFILL GAS BENEFICIAL USE PROJECTS

PROJECT 1

Project Status: ☐ Planned/Developing ☒ Active ☐ Closed
Project Developer: Energy Power Partners, LLC
Project Started Operating (year): 2006
Anticipated Length of Project Operation (years): 20
Project Type: ☐ Direct Thermal ☐ High-Btu ☒ Electric Generation
Electric Generation Capacity (MW): 1.6MW
Annual Electric Energy Generated (kWh): 18,870,482
Gas Volume Used (MMscfy): 362.67
Annual Heat Content (MMBtu/yr.) 196,059
Gas Use Location: Onsite: Yes
Offsite: No
Pipeline Miles: N/A
Offsite Name: N/A
Offsite Location: N/A

PROJECT 2

Project Status: ☐ Planned/Developing ☐ Active ☐ Closed
Project Developer:
Project Started Operating (year):
Anticipated Length of Project Operation (years):
Project Type: ☐ Direct Thermal ☐ High-Btu ☐ Electric Generation
Electric Generation Capacity (MW):
Annual Electric Energy Generated (kWh):
Gas Volume Used (MMscfy):
Annual Heat Content (MMBtu/yr.):
Gas Use Location: Onsite:
Offsite:
Pipeline Miles:
Offsite Name:
Offsite Location:

(Additional projects may be added to back of page using the above format)

Date Prepared		Permit Number
6/20/2022	**APPROVED BENEFITS IN THE DEP HARMS/BENEFITS ANALYSIS WRITTEN REVIEW**	101389

For each approved benefit identified in the DEP Harms/Benefits Analysis Review, please answer and address the following statements. A copy of this page should be provided for all approved benefits.

1. Has the approved benefit been provided?

   See attached narrative.

2. If the answer to question #1 is yes, please explain how the benefit has been provided.

3. If the answer to question #1 is no, please explain why the benefit was not provided.

4. If the answer to question #1 is no, please describe the proposed action that will ensure the approved benefit will be provided.

Use additional sheet(s) to explain if necessary.

Attachment 1

References to the MUNICIPAL WASTE LANDFILL ANNUAL OPERATION REPORT

1. Reference Item B.1. *Form HW-C "Compliance History"*

See Attachment 2

2. Reference Item B.3. *Narrative Description of Progress in Implementing Closure Plan*

In 2021, 9.3 acres of the landfill became inactive or reached finished grade for waste. Revegetative efforts continued on all areas having intermediate cover as needed. The total area of final capping acreage is 58.6 acres.

3. Reference Item B.4. *Groundwater Monitoring Plan Evaluation*

The groundwater monitoring plan (GWMP) was approved by the Department in October 1990. Prior to and since that date, the appropriate GWMP locations have been sampled quarterly and the results have been reported to the Department in accordance with Department regulations.

As indicated in on-going quarterly submissions to the Department, no changes in groundwater elevations or other hydrogeologic conditions at the Frey Farm Landfill have occurred which would require any revisions to the GWMP. LCSWMA has and will continue to monitor, report, and evaluate hydrogeologic conditions in accordance with the approved GWMP.

4. Reference Item B.5. *Radioactivity Monitoring*
See Page 5 of the Annual Operation Report

5. Reference Item B.6. *Landfill Gas Generation, Recovery, and Beneficial Use Data*
See Page 6 of the Annual Operation Report

6. Reference Item B.7. *Landfill Benefits Monitoring*
See attached Narrative

7. Reference Items C.1. *Financial Assurance Bonding Information*
See Attachment 3

8. Reference Items C.2. *Financial Assurance Insurance Certificates*
See Attachment 4

9. Reference Items D. and E. *Topographic Maps and Drawings*
See Attachment 5

2021 Annual Operations Report

Summary of Benefits

1.0 INTRODUCTION

This document presents an update to the detailed evaluation and balancing of the harms and benefits of the Frey Farm Vertical Expansion (FFVE) at the Frey Farm Landfill (FFLF), which is owned and operated by the Lancaster County Solid Waste Management Authority (LCSWMA). This evaluation has been prepared in connection with the Form D Environmental Assessment Process and as required by the PADEP Permit dated July 26, 2017, Condition #4, providing a description of mitigation measures initiated and/or completed and all benefits provided to date.

2.0 BENEFITS

2.1 Local Fees

Manor Township Host Fee

Over the proposed 10-year operating life of the proposed FFVE, this host fee would amount to at least $1,020,000 per year, or a total of $12,331,164.

The Host Benefit fees paid in 2021 were $1,154,615.53.

2.2 Growing Greener Fee

For each ton of waste disposed by LCSWMA at the proposed FFVE, LCSWMA will pay $4.00 to the Commonwealth for landfill disposal fees in support of the Commonwealth's Growing Greener program. Based upon the projected waste receipts over the life of the FFVE (1,800 tpd to 2,500 tpd over a 280-day operating year), this economic benefit, assuming that there is no fee escalation over time, will amount to approximately $2,016,000 to $2,800,000 per year over the proposed operating life of the FFVE. Growing Greener Fee payments would total $20,160,000 to $28,000,000 over the 10-year life of the disposal area.

The Growing Greener fees paid in 2021 were $980,977.20.

2.3 Recycling Fee

For each ton of waste disposed by LCSWMA at the proposed FFVE, LCSWMA will pay $2.00 to the Commonwealth as required by 25 PA Code § 273.315 (c) for recycling (Act 101) fees. Based upon the projected waste receipts over the life of the FFVE (1,800 tpd to 2,500 tpd over a 280-day operating year), this economic benefit, assuming that there is no fee escalation over time, will amount to approximately $1,008,000 to $1,400,000 per year over the proposed operating life of the FFVE. Recycling fee payments would total $10,080,000 to $14,000,000 over the 10-year life of the disposal area.

The recycling fees paid in 2021 were $485,583.71.

2.4 Environmental Stewardship Fee

For each ton of waste disposed by LCSWMA at the proposed FFVE, LCSWMA will pay $0.25 to the Commonwealth as required by 25 PA Code § 273.316 (c) for environmental stewardship fees. Based upon the projected waste receipts over the life of the FFVE (1,800 tpd to 2,500 tpd over a 280-day operating year), this economic benefit, assuming that there is no fee escalation over time, will amount to approximately $126,000 to $175,000 per year over the proposed operating life of the FFVE. Environmental Stewardship Fee payments would total $1,260,000 to $1,750,000 over the 10-year life of the disposal area.

The Environmental Stewardship fees paid 2021 were $101,619.99.

2.5 Operating Costs, Purchases of Goods/Services

Over the proposed 10-year operating life of the proposed FFVE facility, LCSWMA would incur significant operating costs each year. These costs would be related to: equipment purchases; site and equipment maintenance; utility costs; and other operating costs. Additional costs will continue to include (but not limited to): surveying, health and safety provisions, mobilization/demobilization, stormwater management system modifications/upgrades, groundwater monitoring well decommissioning, utility and infrastructure modifications, existing LFG system modifications, new maintenance building installation, truck wash relocation, access road and channel construction, FFLF cap and soil cover removal, MSE berm construction, construction of approximately 9 acres of new liner system and the construction of the proposed leachate collection/detection system clearing and grubbing, excavation, soil processing, and soil stockpiling, installation of approximately 48.4 acres of new final cover and cap system, and based on the necessary upgrades and additions necessary for the existing site LFGCCS, engineering and construction quality assurance (CQA), etc.

Overall, these expenditures would be projected to amount to approximately $49,000,000 over the 10-year facility life of the FFVE.

LCSWMA continues to make equipment purchases, perform site maintenance, pay utilities, etc. as part of normal operations. Additionally, LCSWMA continues to employ local contractors and suppliers to complete capital improvements for the facility. Therefore, this benefit has been realized during the reporting period.

2.6 Wages and Benefits

Over the 10-year operating life for the proposed FFVE, the total value of this benefit will be [at least] approximately $9,881,240 (Note: This amount does not take into account cost of living and performance-based raises that are highly likely to occur. This amount also does not include professional and management-level staff whose jobs are [indirectly] partially or fully sustained due to the need for compliance, planning, engineering, and surveying tasks to be completed in support of the FFLF/FFVE).

LCSWMA has paid annual wages and benefits to its 11 full-time employees at the FFLF during 2021; therefore, this benefit has been satisfied during the reporting year.

2.7 Wage Tax Payments

During the projected 10-year operating life of the proposed FFVE, based on the estimated aggregate wages paid to facility employees and assuming an average total federal, state and local wage tax burden of 20 percent, the employees of the facility will pay, through the life of the FFVE, roughly $197,625 per year to total $1,976,250 over the facility's 10- year life. The annual wages paid to LCSWMA employees will not decrease with the proposed FFVE project and, in fact, are projected to increase, due to adding personnel and standard yearly wages increases.

The above-described taxes will be apportioned to various government agencies and will ultimately result in substantial public benefits. Locally, assuming a 1 percent local wage tax, aggregate local wage taxes paid by employees of the facilities will be approximately $9,880 per year to total $98,800 over the expected 10-year operating life of the facility.

Assuming that employees at the proposed facility will pay a 3.1 percent state tax to the Commonwealth of Pennsylvania, aggregate wage taxes paid by employees of the facilities will be approximately $30,630 per year to total $306,300 over the expected 10-year operating life of the facility.

LCSWMA's 11 full-time employees at the FFLF were subject to wage taxes during 2021; therefore, this benefit has been satisfied during the reporting year.

2.8 Community Benefits

Free Residential Municipal Solid Waste Disposal

As documented in the *Amendment to April 2002 Agreement,* LCSWMA continues to provide for the collection of residential municipal solid waste from residences located on River Road/Route 441 from Washington Borough Park to Safe Harbor Park, Chestnut Grove Road, Oak Road, and Observation Site Road two (2) times per year. There are approximately 174 residences that receive this benefit.

Free Yard Waste Disposal

LCSWMA offers free waste disposal to Manor Township residents for yard waste.

Free Waste Disposal for Cleanup Crews

LCSWMA also waives tipping fees for the disposal of litter picked up by cleanup crews.

Recycling Center

LCSWMA continues to provide a local public drop-off center for recyclables and composting for the convenience of local residents with the approval of the FFVE.

Community Tours/Educational Programs

LCSWMA continues sponsorship of community information and educational services such as: (i) environmental education through site tours; and (ii) on-site presentations for residents. Community educational outreach were conducted during 2021, but at a reduced level due to the COVID-19 pandemic. LCSWMA also published a virtual web tour of the FFLF which is accessible for the public and community members to view at their convenience.

Attachment 2

FORM HW-C

COMPLIANCE HISTORY

including Attachments “A”, “B”, “C” and “D”

2540-FM-BWM0058 Rev. 1/2015

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

FORM HW-C
COMPLIANCE HISTORY

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Form HW-C Submittal (check all that apply):

☐ **Original Filing** ☒ **Amended Filing** **Date of Last Filing** **04/20/2022**

Type of Permit or License Submittal:

☐ **New Application** ☐ **Renewal** ☒ **Annual Update** ☐ **Other** _____
(specify)

A. General Applicant Information:

1. NAME OF PERMIT OR LICENSE APPLICANT/PERMITTEE/LICENSEE ("applicant") (non-corporations attach documentation of legal name):

Lancaster County Solid Waste Management Authority

ADDRESS: 1299 Harrisburg Pike

Lancaster, PA 17603

TELEPHONE NUMBER: (717) 397-9968

TAXPAYER ID#: 23-6006036

PERMIT, LICENSE OR APPLICATION ID#: 101389

2. Identify the form of management under which the applicant conducts its business (check appropriate box) and describe the type(s) of business activities performed:

☐ Individual
☐ Municipality
☐ Proprietorship
☐ Public Corporation
☐ Private Corporation
☐ Syndicate
☒ Municipal Authority
☐ Fictitious Name
☐ Partnership
☐ Limited Partnership
☐ Government Agency
☐ Joint Venture
☐ Association
☐ Other Type of Business _____
(specify)

3. Type of permit, license or application (check all that apply):

☐ Hazardous Waste Permit
☐ Hazardous Waste Transporter License
☒ Municipal Waste Permit
☐ Regulated Medical, Chemotherapeutic Waste Transporter License
☐ Residual Waste Permit
☐ Other _____
(specify)

FORM HW-C

B. General Information Regarding "Related Parties"

1. **Applicants which are a corporation or a division of a corporation,** provide the following information:

   a. The principal shareholders or stockholders who own, hold, or control stock of five percent (5%) or more of a publicly held corporation or ten percent (10%) or more of a privately held corporation.

   b. State the names, principal places of business and taxpayer ID numbers of all domestic and foreign parent corporations (including ultimate parent corporations), and all domestic and foreign subsidiary corporations of the applicant, as well as the subsidiary corporations of the ultimate parent corporation. Include unincorporated divisions and private corporations. A diagram of corporate structure may be provided to illustrate corporate relationships.

   c. List all principals of the corporation that have also been principals of other corporations which have committed any violation of the Environmental Protection Acts. (See Instructions, Items 2 and 6.)

2. Provide the names and addresses of all principals, corporate officers, general and limited partners, directors, other persons performing a function similar to a director, and other persons or related parties of the applicant (see Instructions, Items 4 and 5). The relationship to the applicant must be clearly described.

3. Provide the names and addresses, or IRS tax identification numbers[1] and affiliation of other persons or related parties having or exercising control over any aspect of the proposed facility or activity that is regulated by the Department, including but not limited to, associates, agents, contractors, subcontractors, and property owners.

4. Provide the names and addresses of all owners of record of surface and subsurface areas within and contiguous to the proposed permit area. (Not applicable to transporter license applicants.)

5. Provide the names and addresses of all holders of record to a leasehold interest of surface and subsurface areas within and contiguous to the proposed permit area.

6. If the applicant, or other related party to the applicant, has a beneficial interest in, or otherwise manages or controls any other person, municipality or other related party (as described in Sections A and B) engaged in the business of solid waste collection, transportation, storage, processing, treatment, or disposal, provide the following information:

   a. The name, address and tax identification number or employer identification number of the corporation, other person, municipality, or other entity, in which the applicant or other related party has a beneficial interest, manages, or controls as described above.

      NOT APPLICABLE

   b. The nature of the relationship or participation with the corporation, other person, municipality, or other related party.

      NOT APPLICABLE

[1] Failure to provide all applicable numbers may delay processing of the application.

FORM HW-C

C. Specific information Regarding the Applicant and Its Related Parties

1. List the name and location of all of the **applicant's** and **related party's places of business and terminals** where municipal, residual and/or hazardous waste activities are conducted. Such activities include, but are not limited to generation, processing, collection, transportation and storage, treatment or disposal of solid waste, except that locations that generate only municipal waste need not be listed.

   a. Frey Farm Landfill, 3049 River Road, Conestoga, PA 17516
   b. Frey Farm Landfill Treatment Plant, 3049 River Road, Conestoga, PA 17516
   c. Lancaster County Resource Recovery Facility, 1911 River Road, Bainbridge, PA 17502
   d. LCSWMA Transfer Station, 1299 Harrisburg Pike, Lancaster, PA 17604
   e. Household Hazardous Waste Facility, 1299 Harrisburg Pike, Lancaster, PA 17604
   f. Susquehanna Resource Management Complex, 1670 South 19th Street, Harrisburg, PA 17104
   g. Susquehanna Resource Management Complex Ash Landfill, 1670 South 19th Street, Harrisburg, PA 17104

2. List all **permits or licenses issued** by the Department or any other state or federal agency under the Environmental Protection Acts to the applicant or any other persons or related parties identified in Sections A or B, that are currently in effect or have been in effect at any time in the ten years previous to the date on which this form is notarized. This list is to include the type of permit or license, permit or license number, location, address, issuance date and expiration date.

   See Attachment "C"

3. List all **permit or license denials** issued by the Department or any other state or federal agency under the Environmental Protection Acts to the applicant or any other person or related party identified in Section A or B, within ten years previous to the date on which this form is notarized. Include the type of permit or license, permit or license number, location, denial date and reason for denial.

   NONE

4. List all persons or related parties identified in Sections A or B which have filed for or been discharged from **bankruptcy** within 10 years previous to the date on which this form is notarized. Specify the circumstances of bankruptcy including those for which the debtor sought to abandon property or to be discharged from any environmental liability subject to the Environmental Protection Acts. Include the name of the bankruptcy court, docket number and description and location of any property involved.

   NONE

D. Compliance Background:

(Note: Copies of specific documents must be made available to the Department upon its request)

FORM HW-C

Compliance History:

List all **"Enforcement Actions"** issued by the Department or any other state or federal or county agency to the applicant or those persons or related parties identified anywhere in response to Sections A, B or C using the following format grouped by state and location in chronological order.

Date	Location	Permit/ License/ EPA ID #	Issuing Agency	Type of Action	Nature of Violation	Disposition	Dollar Amount of Penalty

Enforcement actions include but are not limited to:

All **notices of violation (NOVs),** issued by any regulatory agency to the applicant or those persons or related parties identified anywhere in Sections A, B or C concerning the Environmental Protection Acts, or any other environmental statute, regulation or ordinance.

All **administrative orders, civil penalties, permit or license suspensions/revocations, bond forfeiture actions,** and **civil penalty** actions adjudicated by any judicial body against the applicant or those persons or related parties identified anywhere in Sections A, B or C concerning the Environmental Protection Acts, or a regulation or order or a condition of a permit or license.

All **consent orders, consent adjudications, consent decrees or monetary settlements (settlement agreements, letter agreements, settlement letters or consent assessments)** between the applicant or those persons or related parties identified anywhere in Sections A, B or C and any state, federal or county agency regarding the Environmental Protection Acts, or any other environmental statute, regulations or ordinance.

All **court proceedings** in which those persons or related parties identified anywhere in Sections A, B or C have been involved in relation to the Environmental Protection Acts.

All **summary, misdemeanor, or felony convictions,** or **pleas of guilty or no contest** that have been obtained against the applicant or those persons or related parties identified anywhere in Sections A, B or C, pursuant to the Environmental Protection Acts, or for any acts involving the generation, storage, treatment, transportation, processing, or disposal of municipal, residual or hazardous waste.

For all persons and municipalities identified in Section A, B or C, indicate all violations committed and any subsequent enforcement actions taken regarding the facility or activity not previously listed in this section, concerning the Environmental Protection Acts.

State the reasons for suspension, revocation, or denial of any permit/permit application or license/license application filed by the applicant or any related party concerning the Environmental Protection Acts. Provide the date, location and nature of the violations, type of action, issuing agency, dollar amount of any monetary penalty associated with the action and permit, license, EPA ID# or other identifying number if applicable.

FORM HW-C

I hereby certify that I have the authority to respond to the above questions on behalf of the applicant, and that the information provided herein is true and correct to the best of my knowledge, information and belief.

(Signature)

Name: Robert B. Zorbaugh
(Print or Type Name)

Title: Chief Executive Officer
(Print or Type Title)

COMMONWEALTH OF PENNSYLVANIA - NOTARY SEAL
Teresa Maria Barnett, Notary Public
Lancaster County
My Commission Expires 07/29/2023
Commission Number 1353948

Sworn to and subscribed before me this
24th day of June,
2022.

Notary Public

(Signature)

Name: Daniel A. Brown
(Print or Type Name)

Title: Environmental Compliance Manager
(Print or Type Title)

COMMONWEALTH OF PENNSYLVANIA - NOTARY SEAL
Teresa Maria Barnett, Notary Public
Lancaster County
My Commission Expires 07/29/2023
Commission Number 1353948

Sworn to and subscribed before me this
24th day of June,
2022.

Notary Public

Attach copy
of Articles of Incorporation

(For Corporations, see the Instructions, Item 9, regarding signatures and submission of Articles of Incorporation.)

LCSWMA
1299 HARRISBURG PIKE | LANCASTER, PA 17603
PHONE: 717-397-9968 | FAX: 717-397-9973
www.lcswma.org

Attachment A

LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY
JANUARY 2022

BOARD OF DIRECTORS	ADDRESS	PHONE/FAX
Michael W. Brubaker (Spouse: Cindy) Chair – Term Exp. 12/31/24 *Year Appointed: 2015* Email: mwbrubaker@gmail.com	40 South Broad Street Lititz, PA 17543	Work/Cell: 717-945-9139
George Rettew (Spouse: Jackie) Vice-Chair – Term Exp. 12/31/21 Year *Appointed: 2017* Email: grettew68@comcast.net	1078 Olde Forge Crossing Lancaster, PA 17601	Cell: 717-940-6252
J. Scott Ulrich (Spouse: Louise) Secretary - Term Exp. 12/31/22 *Year Appointed: 2011* Email: jscottulrich@gmail.com	1410 Picket Drive Lancaster, PA 17601	Cell: 717-575-6598
R. Edward Gordon (Spouse: Jean) Treasurer – Term Exp. 12/31/23 *Year Appointed: 2003* Email: yankskis@comcast.net	1016 Stonemanor Dr. Lancaster, PA 17603	Cell: 717-940-8395
John Blowers (Spouse: Lisa) Member– Term Expires 12/31/25 *Year Appointed: 2021* Email: jblowers1@gmail.com	102 Strasburg Pike Lancaster, PA 17602	Cell: 717-475-0921
Joseph R. Deerin Member – Term Exp. 12/31/24 *Year Appointed: 2012* Email: jrdeerin@deerincompanies.com	1414 Valley Road Lancaster, PA 17603	Work: 717-735-5545 Cell: 717-314-2260 Home: 717-392-8237
Steve Dzurik (Spouse: Kristin) Member – Term Exp. 12/31/21 *Year Appointed: 2012* Email: steve_dzurik@ajg.com	484 Lancer Drive Columbia, PA 17512	Home: 717-285-3863 Work: 443-798-7476) Cell: 717-682-8227 Fax: 443-798-7290
Lester O. Houck (Spouse: Faye) Member – Term Exp. 12/31/21 *Year Appointed: 2001* Email: lohouck@comcast.net	361 Diem Woods Drive New Holland, PA 17557	Work: 717-768-8059 Home: 717-354-9793 Cell: 717-413-6267
Karen M. Weibel (Spouse: Robert) Member – Term Exp. 12/31/23 *Year Appointed: 2009* Email: kweibel@ptd.net	202 North Cedar Street P.O. Box 112 Lititz, PA 17543	Home: 717-626-5028 Cell: 717-314-4628 Fax: 717-626-9142

LCSWMA
1299 HARRISBURG PIKE | LANCASTER, PA 17603
PHONE: 717-397-9968 | FAX: 717-397-9973
www.lcswma.org

LCSWMA Executive Team	**1299 Harrisburg Pike Lancaster, PA 17603**	**Phone: 397-9968 Fax: 397-9973**
Robert B. Zorbaugh (Spouse: Stacy) Chief Executive Officer Email: bzorbaugh@lcswma.org	1832 Fritz Lane Lancaster, PA 17602	Office: 717-735-0162 Cells: 717-666-8014 717-669-2526
Thomas F. Adams (Spouse: Brittainy) Chief Operating Officer Email: tadams@lcswma.org	1981 New Danville Pike Lancaster, PA 17603	Office: 717-735-0180 Cell: 717-327-9951
Daniel G. Youngs (Spouse: Crystal) Chief Financial Officer Email: dyoungs@lcswma.org	826 S. 14th Avenue Lebanon, PA 17042	Office: 717-735-0164 Cell: 717-644-5099
Michelle Marsh Chief Business Development Officer Email: mmarsh@lcswma.org	157 W. Market Street Marietta, PA 17547	Office: 717-735-0178 Cell: 717-572-3188
Alex Henderson (Spouse: Molly) General Counsel Email: ahenderson@lcswma.org	2051 Rice Road Lancaster, PA 17603	Office: 717-735-0175 Cell: 717-475-9177

Attachment "B"
Reference FORM HW-C Item B.4.

FREY FARM LANDFILL
CONTIGUOUS LANDOWNERS

Aaron C. Frey
3106 River Road
Conestoga, PA 17516

Ann M. Kirchner
3100 River Road
Conestoga, PA 17516

Anthony L. Wenger
3126 River Road
Conestoga, PA 17516

Brian J. Sensenich
3076 River Road
Conestoga, PA 17516

Craig A. Frey
3232 Anchor Road
Washington Boro, PA 17582

John G. Miller
3052 River Road
Conestoga, PA 17516

Hans E. Weber
3088 River Road
Conestoga, PA 17516

Manor Township
950 West Fairway Drive
Lancaster, PA 17603

ATTACHMENT C

Reference Form MRW-C; Section E

LCSWMA Permit List

LCSWMA Permits; DEP Client #4660

Lancaster County Waste Plan **Issued: 10/06/2014** **Expires: 10/06/2034**

Resource Recovery Facility:

1911 River Road, Bainbridge, PA 17502
DEP site ID #241770; facility ID #255039 (Covanta Client ID# 2839)

Bureau	Number	Regarding	Start	End
BLRWM	400592	Municipal Waste	01/07/2019	3/30/2029
BWQM	36-62776	AST/UST	Annual	
	3688402	Water Storage Ponds	2/22/1989	No Expiration
BSWC	3688802	Earth Disturbance	2/22/1989	No Expiration
BCEC	3688532	Drinking Water	11/5/1991	No Expiration
BAQC	36-05013	Title V	02/01/2022	1/31/2027
SRBC	20180908	Groundwater Usage	9/8/2018	9/30/2033

Notes: (1) The Facility holds EPA ID #0000103713

Susquehanna Resource Management Complex:

1670 S. 19th Street, Harrisburg, PA 17104
DEP site ID#450856; facility ID# 481371 (RRF)/ # 478223 (LF)

Bureau	Number	Regarding	Start	End
BLRWM	100758	Municipal Waste (SRMC)	12/23/2013	11/29/2022
BLRWM	100759	Municipal Waste (Ash Landfill A)	Closed	
BLRWM	100992	Municipal Waste (Ash Landfill B)	7/11/2018	6/1/2028
BWQM	403508	Stormwater NPDES – PAG-03	09/24/2016	09/23/2022
BAQC	22-05007	Title V	01/01/2018	12/31/2022
CRW	122022-9	Industrial User	12/21/17	12/20/2022
SRBC	20140906	Groundwater Usage	10/1/2014	9/30/2029

Transfer Station:

1299 Harrisburg Pike, Lancaster, PA 17603
DEP site ID #577359/556046; facility ID 596402
Notes: (1) HHW Facility holds EPA ID # PAD987284932

Bureau	Number	Regarding	Start	End
BLRWM	100009	Municipal Waste	12/10/2013	4/12/2024
BWQM	PAR403505	Stormwater NPDES – PAG-03	9/24/2016	9/23/2022
	36-17038	AST/UST	Annual	

ATTACHMENT C

Reference Form MRW-C; Section E

LCSWMA Permit List

Frey Farm Landfill:

3049 River Road, Conestoga, PA 17516
DEP site ID #450744; facility ID #477357; client ID #4703/#4660

Bureau	Number	Regarding	Start	End
BLRWM	101389	Municipal Waste	9/27/2010	5/26/2031
BWQM	PAR503501	Stormwater NPDES – PAG-03	9/24/16	9/23/2022
BAQC	36-05081	Title V (BAQC facility id #522092)	1/1/2022	12/31/2026
LASA	377	Leachate Discharge	3/27/2021	3/26/2026
SRBC	20061208	Groundwater Usage	12/5/2006	12/5/2031
BAQ	GP3-36-0581 & GP-9-36-05081	Portable Nonmetallic Mineral Processing Plant and Diesel or No. 2 Fuel-Fired IC Engine	2/28/2019	2/29/2024
BAQ	GP3-36-0581B & GP-9-36-05081B	Portable Nonmetallic Mineral Processing Plant and Diesel or No. 2 Fuel-Fired IC Engine	5/14/2021	5/31/2026

Creswell Landfill:

3049 River Road, Conestoga, PA 17516
DEP site ID #248683

Bureau	Number	Regarding	Start	End
BLRWM	100008	Municipal Waste	Closed	
BWQM	PA0043486	CWLTP NPDES	2/1/2022	01/31/2027
BAQC	36-05081	Title V	1/1/2022	12/31/2026

INASHCO Metals Recovery Facility:

Bureau	Number	Regarding	Start	End
BWQM		Stormwater NPDES – PAG-03 Non-Exposure Certification	04/01/2018	03/31/2023

Frey Farm Liquid Treatment Plant:

DEP site ID #497686

Bureau	Number	Regarding	Start	End
BLRWM	301317	Residual Waste	6/10/1998	6/9/2008
LASA	377	Leachate Discharge	3/27/2016	3/27/2021

ATTACHMENT C

Reference Form HW-C; Item C.2.

LCSWMA Permit List

Miscellaneous LCSWMA Permit Information:

1) LCSWMA Federal I.D.# (tax #): 23-6006036
2) LCSWMA Dunn and Bradstreet #: 06-709-5828
3) LCSWMA Unique Entity Identifier (UEI): MY4MWC6GTLL9
4) SIC; 4953 Refuse Systems (solid waste landfills, combustors)
5) NAICS;
   a) 562212 (Waste Treatment and Disposal; Solid Waste Landfills); LF
   b) 562998 (All Other Miscellaneous Waste Management Services); TS
   c) 562213 (Waste Treatment and Disposal; Solid Waste Combustors); RRF
6) Other DEP-recognized sites owned by LCSWMA include:
   a) CFI; site ID #577301
   b) Lancaster Malleable LF; site ID #248940
7) Other miscellaneous permit information:
   a) SRMC Covanta Stormwater NPDES Permit #PAS503501
   b) Spotted Lanternfly Permit PA-20190508569 Permit Issued 5/20/19
   c) Waste Tire Transporter Authorization License; Issued 12/15/2021; Expires 1/31/2023
   d) US DOT Number 468748

ATTACHMENT "D" Reference FORM HW-C Item D.

DATE	LOCATION	PERMIT/ LICENSE/ EPA ID#	ISSUING AGENCY	TYPE OF ACTION	NATURE OF VIOLATION	DISPOSITION	DOLLAR AMOUNT OF PENALTY
7/14/11	Transfer Station	100009	PaDEP/BWM	NOV	Failure to disclose prior violations	Comply/Closed	N/A
9/28/11	Transfer Station	100009	Comm. of PA	Non-traffic citation	Brake Line Chafing	Comply/Closed	$691
9/28/11	Transfer Station	100009	Comm. of PA	Non-traffic citation	Brake Hose Chafing	Comply/Closed	$650
4/20/12	Resource Recovery Facility	400592	PaDEP/BAQC	CACP	Emission Limits Violations; 2nd Qtr 2010	Comply/Closed	$400
1/6/2012	Transfer Station	100009	Comm. of PA	Non-traffic citation	Non-traffic citation, Axle was grease soaked thus reducing brake efficiency	Civil Penalty Paid	$142.00
5/10/12	Transfer Station	100009	Comm. of PA	Non-traffic citation	Non-traffic citation, Brake alignment	Civil Penalty Paid	$392.00
6/1/12	Resource Recovery Facility	400592	PaDEP/ BWSM	NOV	Public Water Supply Permit, Total Coliform Exceedence	Corrected/Abated	N/A
7/13/12	Transfer Station	100009	PaDEP/BWM	NOV	Failure to disclose prior violations	Comply/Closed	N/A
2/20/14	Susquehanna Resource Management Complex	100758	PaDEP/BWM	Non-Compliance	Surface water discharge	Comply/Closed	N/A
2/20/14	Susquehanna Resource Management Complex	100758	PaDEP/BWM	Non-Compliance	Ash handling violation	Comply/Closed	N/A
3/18/14	Susquehanna Resource Management Complex Ash Landfill	100992	PaDEP/BWM	NOV	Leachate overflow	Comply/Closed	N/A
5/4/14	Susquehanna Resource Management Complex Ash Landfill	100992	PaDEP/BWM	NOV	Leachate overflow	Comply/Closed	N/A
01/28/16	Susquehanna Resource Management Complex	100758	PaDEP/BAQC	CACP	Emission Limits Violations; 1st Qtr 2014 – 1st Qtr 2015	Civil Penalty Paid	$5,400

ATTACHMENT "D" Reference FORM HW-C Item D.

DATE	LOCATION	PERMIT/ LICENSE/ EPA ID#	ISSUING AGENCY	TYPE OF ACTION	NATURE OF VIOLATION	DISPOSITION	DOLLAR AMOUNT OF PENALTY
12/30/19	Susquehanna Resource Management Complex	100758	PA DEP / BAQC	TBD	Emission Limits Violations: 2nd Qtr 2015 – 1st Qtr 2017	Civil Penalty Paid	$42,129.65
04/05/18	Resource Recovery Facility	400592	PA DEP / BAQC	CACP	3rd Qtr 2010 – 1st Qtr 2017 Emission Exceedences	Civil Penalty Paid	$42,196.23
05/01/19	Creswell Landfill	PA0043486	PA DEP/ BCW	NOV	Discharge Limits Exceeded	Comply/Closed	N/A
01/13/2020	Frey Farm Landfill	377	LASA	NOV	Discharge Limit Exceeded	Comply/Closed	N/A
06/23/2021	Resource Recovery Facility	400592	PA DEP / BAQC	CACP	2nd Qtr 2017 – 1st Qtr 2019 Emission Exceedences	Civil Penalty Paid	$8,700
11/12/2021	Resource Recovery Facility	400592	PA DEP / BAQC	CACP	2nd Qtr 2019 – 4th Qtr 2020	Civil Penalty Paid	$2,050
11/16/2021	Resource Recovery Facility	PWS# 7360978	PA DEP / BSDW	NOV	Failure to Monitor – DRR – Week of 8/29/2021-9/4/2021	Comply/Closed	N/A
02/18/2022	Susquehanna Resource Management Complex	100758	PA DEP / BAQC	CACP	2nd Qtr 2017 – 1st Qtr 2019 Emission Exceedences	Civil Penalty Paid	$35,097
05/31/2022	Susquehanna Resource Management Complex	100758	PA DEP / BAQC	CACP	2nd Qtr 2019 – 1st Qtr 2020 Emission Exceedences	Civil Penalty Paid	$13,924

Attachment 3

BONDING INFORMATION

2021 Annual Operations Report
LCSWMA Frey Farm Landfill – Bonding Information

Currently, the LCSWMA Frey Farm Landfill has an approved Closure/Post-Closure Bond in the amount $9,447,860. In accordance with Department requirements, an annual review of the line items and supporting information was completed for calendar year 2021. In summary:

Frey Farm Landfill Bond Comparison		
	2020	2021
Decontaminating the Facility	$ 11,777	$ 11,766
Capping/closure	$ 4,002,158	$ 4,002,158
Groundwater Monitoring	$ 632,019	$ 632,019
Surface Water Monitoring	$ 45,519	$ 45,519
Private Water Supply Monitoring	$ 330,634	$ 330,634
Gas Monitoring	$ 84,221	$ 84,221
Gas Collection/Maintenance	$ 573,641	$ 573,641
Other Monitoring	$ 192,063	$ 192,063
Leachate Management	$ 2,030,066	$ 2,011,308
Borrow Area Closure	$ 26,499	$ 26,499
Maintenance Costs	$ 1,098,642	$ 1,098,642
Admin; inflator, contingency	$ 2,088,687	$ 1,995,599
Total	$11,115,925	$11,004,068

Bonding Worksheet A

1. Maximum volume of solid waste required to be moved or disposed as part of closure (includes cost for solidification)	400	tons
2. Estimated volume of contaminated soils or materials (from accidents, spills, prior remediations)	0	
3. Total Volume of waste	400	tons
4. Unit cost to dispose off-site (include any analysis or transportation cost)	$12.25	$/ton
5. Total Cost	$4,900	
6. Estimated volume of contaminated liquid generated during decontamination	50,000	gallons
7. Unit cost to treat/dispose of contaminated liquids (including any transportation)	$0.019	/gal.
8. Total Cost to dispose of contaminated liquids	$941.93	
9. Estimated volume of fill material	500	CY
10. Unit cost of acquiring, transporting, placing and stabilizing (i.e. revegetating fill material (include costs for off-site purchase if soil not available on site)	$7.05	$/CY
11. Total Cost to fill	$3,524	
12. Equipment decontamination cost	$2,000	LS
TOTAL COST WORKSHEET A	**$11,766**	

Bonding Worksheet B

1. Volume of fill required for area not at final/intermediate grade, but would require filling prior to capping: 0 CY

2. Maximum area to be capped and covered (this should include all areas at final grade not capped, intermediate grades and areas to be filled to intermediate grades then capped): 57.1 acres

3. Closure design, surveying and development of construction drawings (use $750.00/acre of number 2). $42,825

   a. Construction and Maintenance of access roads. $30,000 LS

Material Volumes/Areas:

4. Earthen Materials

a. Structural Fill	0	CY	(Specification[1])	
b. Intermediate Cover	46,061	CY	(Specification[1])	
c. Clay Cap Material	0	CY	(Specification[1])	
d. Final Cover Soil	184,243	CY	(Specification[1])	
e. Sand/Stone	0	CY	(Specification[1])	
f. Other	0	CY	(Specification[1])	

5. Synthetic Materials

a. Geotextile	2,611,640	Sq. Ft.	(Type)	
b. FML	2,611,640	Sq. Ft.	(Type)	
c. Drainage Layer	2,611,640	Sq. Ft.	(Type)	
d. Other		Sq. Ft.	(Type)	

6. Cap Penetrations: Estimate the number of cap penetrations that will need to be installed for closure of the facility including, but not limited to gas extraction wells, cleanouts, valve pits, etc. 71

7. Unit cost to place or regrade material to reach final grades (this may include additional waste placement to reach grade) $1.48 $/CY

Are sufficient soils available in permitted on-site borrow areas to complete job? (Attach maps that identify sources and stockpiles) yes

8. Earthen Materials

   a. Structural Fill

1. Stockpile	0
2. Borrow	
Total	
On-site	Yes / No
Processing Required	Yes / No
Unit cost to place[2]	$5.03

b. Intermediate Cover

1. Stockpile	46,061
2. Borrow	
Total	
On-site	Yes
Processing Required	No
Unit cost to place^2	$2.66

c. Clay Cap Material

1. Stockpile	
2. Borrow	
Total	
On-site	Yes / No
Processing Required	Yes / No
Unit cost to place^2	

d. Final Cover Soil

1. Stockpile	184,243
2. Borrow	
Total	
On-site	Yes
Processing Required	Yes
Unit cost to place^2	$5.10

e. Sand/Stone

1. Stockpile	
2. Borrow	
Total	
On-site	Yes / No
Processing Required	Yes / No
Unit cost to place^2	

f. Other

1. Stockpile	
2. Borrow	
Total	
On-site	Yes / No
Processing Required	Yes / No
Unit cost to place^2	

9. Synthetic Materials

a. Geotextile
Unit cost to place^3 $0.218 sq. ft.

b. FML
Unit cost to place^3 $0.370 sq. ft.

c. Drainage Layer

Unit cost to place[3] $0.374 sq. ft.

d. Other
Unit cost to place[3] sq. ft.

10. Cap Penetrations Unit Cost
List the unit cost to fabricate and install each cap penetration
Unit cost to place[3] $150 $/each

11. Unit Cost to construct E & S structures (i.e. channels, letdowns, etc.) $1,136 $/acre

12. Revegetation Cost
(Seeding rate used: _____ lbs/acre)
(Lime rate used: _____ tons/acre)
(Fertilizer rate used: _____ tons/acre)
(Mulch rate used: _____ tons/acre)
Unit cost to revegetate[3] $1,524 $/acre

13. Cost Summary

a. Fill (line 1 x line 7)	$0
b. Construction Drawings (line 3)	$42,825
c. Construction Roads (line 3a)	$30,000
d. Structural Fill (line 4a x line 8a)	$0
e. Intermediate Cover (line 4b x line 8b)	$122,393
f. Clay Cap Material (line 4c x line 8c)	$0
g. Final Cover (line 4d x line 8d)	$939,638
h. Sand/Stone (line 4e x line 8e)	$0
I. Other (line 4f x line 8f)	$0
j. Geotextile (line 5a x line 9a)	$569,532
k. FML (line 5b x line 9b)	$967,145
l. Drainage Layer (line 5c x line 9c)	$977,476
m. Other (line 5d x line 9d)	$0
n. Penetrations (line 6 x line 10)	$10,706
o. E & S Structures (line 2 x line 11)	$64,866.41
p. Revegetation (line 12 x line 2)	$86,999
Subtotal	**$3,811,579**
CQA costs (use 5% of subtotal)	$190,579
Total	**$4,002,158**

1. Number of wells in the approved monitoring plan.		19
a. Shallowest well depth	28 ft.	
b. Deepest well depth	299 ft.	
c. Average well depth	106.4 ft.	
d. Number with dedicated pumps	19	
2. Unit cost to upgrade an existing well with dedicated pump		$750 $/well
3. Unit cost to install a well (assume average well depth, and include drilling, installation, developing and pump installation)		$15,500 $/well
4. Number of wells to be installed (wells in the approved plan that haven't been installed)		2
5. Number of wells to be replaced over the life of the monitoring period (use 10% of line 1 and round up)		2
6. Number of pumps to be replaced/repaired (use 25% of line 1 over the monitoring period)		5
7. Unit cost to purge and sample a well (assume average well depth, and include methane monitoring, record keeping and shipping)		$26 $/well
8. Unit cost to analyze sample(s)		
a. Quarterly (25 PA Code §273.284, §277.284, or §288.254)		$145 $/well
b. Annually (15 PA Code §273.284, §277.284, or §288.254)		$254 $/well
9. Unit cost to analyze data (includes review of lab QA/QC data, database input, form completion, statistical analysis and data review)		$43 $/well
10. Cost to purge, sample and analyze -- quarterly (line 7 + line 8a + line 9)		$212 $/well
11. Cost to purge, sample and analyze -- annually (line 7 + line 8b + line 9)		$328 $/well
12. Number of years of sampling (30 + time to close)		31 years

13. Cost Summary -- Groundwater Monitoring System

a. System upgrade ([line 1 -- line 1d] x line 2)		$0
b. Wells to be Installed (line 3 x line 4)		$31,000
c. Wells to be replaced (line 3 x line 5)		$29,450
d. Pumps to be replaced (line 2 x line 6)		$3,563
e. Cost of Quarterly Monitoring (line 1 x 3 x line 10 x line 12)		$374,762
f. Cost of Annual Monitoring (line 1 x line 11 x line 12)		$193,245
	Subtotal	**$632,019**

Adjustment for resampling, assessments, etc.

a. Use 0% of subtotal if no assessments in last 2 yrs.		
b. Use 5% of subtotal if assessment in last 2 yrs.		
c. Use 10% if currently in assessment, abatement or increaste monitoring		$0
	Total	**$632,019**

Solid Waste Surface Water Sampling

1.	Number of surface points monitored for Solid Waste Permit	1	
2.	Unit cost to sample surface point (record keeping and shipping)	$17	$/point
3.	Unit cost to analyze sample(s)		
	a. Quarterly (25 PA Code §273.284 or §288.254)	$145	$/point
	b. Annually (15 PA Code §273.284 or §288.254)	$254	$/point
4.	Unit cost to analyze data (includes review of lab QA/QC data, database input, form completion, and data review)	$43	$/point
5.	Cost to sample and analyze -- quarterly (line 2 + line 3a + line 4)	$205	$/point
6.	Cost to sample and analyze -- annually (line 2 + line 3b + line 4)	$314	$/point
7.	Number of years of sampling (30 + time to close)	31	years

NPDES Surface Discharge Sampling

8.	Number of outfalls monitored	2	
9.	Monitoring frequency (i.e. monthly, quarterly, etc.)	Semi-Annual	
10.	Number of samples to be taken per point/year	2	
11.	Unit cost to sample surface point (record keeping and shipping)	$17	$/point
12.	Unit cost to analyze sample(s) (including data review and completing DMR)	$105	$/point
13.	Number of years of sampling (30 + time to close)	31	years

14.	Cost Summary -- Surface Water Monitoring	
	a. Cost of Quarterly Surface Water Monitoring (line 1 x "4" x line 5 x line 7)	$18,933
	b. Cost of Annual Surface Water Monitoring (line 1 x line 6 x line 7)	$9,907
	c. Cost of NPDES Monitoring (line 8 x line 10 x [line 11 + line 12] x line 13)	$15,163
	d. NPDES renewals over post-closure period (includes application development, fees, etc.) use 10% of line 14c	$1,516
	Subtotal	**$45,519**

Adjustment for resampling, assessments, etc.

	a. Use 0% of subtotal if no assessments in last 2 yrs.	
	b. Use 5% of subtotal if assessment in last 2 yrs.	
	c. Use 10% if currently in assessment, abatement or increased monitoring	$0
	Total	**$45,519**

Worksheet E - Contiguous Landowner Monitoring

Number of private water supplies monitored	10	
Unit cost to sample a well (include methane monitoring, record keeping and shipping)	$28	$/well
Unit cost to analyze sample(s) quarterly (Act 101 Section 1103)	$197	$/well
Unit cost to analyze data (includes review of lab QA/QC data, database input, form completion, and data review)	$42	$/well
Total cost for quarterly sampling (line 2 + line 3 line 4)	$267	$/well
Number of years of sampling (30 + time to close)	31	years

Cost Summary -- Private Water Supply Monitoring

a. Cost of quarterly monitoring (line 5 x 4 x line 6)	$330,634	
Sub-Total	**$330,634**	

1. Number of probes in the approved monitoring plan.		8	
a. Shallowest probe depth	14	ft.	
b. Deepest probe depth	41	ft.	
c. Average probe depth	18.875	ft.	
d. Number of probes installed	8		
2. Unit cost to install probe (including drilling and installation)		$8,622	$/probe
3. Number of probes to be installed (probes in the approved plan that haven't been installed)		6	
4. Number of probes to be replaced over the life of the monitoring period (use 5% of line 1 and round up)		1	
5. Unit cost to monitor a probe (include record keeping)		$24.06	$/probe
6. Number of probes and structure monitoring events per year		4	
7. Number of years of monitoring (30 + time to close)		31	years
8. Cost Summary -- Gas Monitoring System			
a. System completion (line 3 x line 2) $		$51,729.00	
b. Probe replacement (line 2 x line 4) $		$8,622.00	
c. Probe Monitoring (line 1 x line 5 x line 6 x line 7)		$23,870.00	
	Subtotal	**$84,221.00**	
Adjustment for resampling, assessments, etc.			
a. Use 0% of subtotal if no assessments in last 2 yrs.		0%	
b. Use 5% of subtotal if assessment in last 2 yrs.			
c. Use 10% if currently in assessment or increased monitoring			
	Total	**$84,221.00**	

Worksheet G - Gas Collection System

1.	Number of wells in the approved monitoring plan.		~ 86	
	a. Shallowest well depth	32 ft.		
	b. Deepest well depth	239.8 ft.		
	c. Average well depth	122.2 ft.		
	d. Number of wells installed	0		
	e. Number of pumping wells	0		
2.	Cost for flare or other control device installation		$0.00	LS
3.	Unit cost to install a well (including drilling, installation, and connection to active system)		$8,500.00	$/well
4.	Unit cost to install a gas well requiring liquid removal (including drilling, installation, and connection to active system)		$0.00	$/well
5.	Number of wells to be installed (wells in the approved plan that haven't been installed)		28	
6.	Number of gas wells required liquid removal to be installed		0	
7.	Estimate the length of collection piping to be installed		3,467	LF
8.	Unit cost to install collection piping (include excavation, pipe bedding, pipe, backfilling, regrading, revegetating, surveying and QA/QC)		$35.00	$/LF
9.	Number of wells to be replaced/repaired over the life of the monitoring period (use 10% of line 1 and round up)		9	
10.	Unit cost to monitor well and balance system monthly (include monitoring of methane, oxygen, carbon dioxide or nitrogen, temperature, pressure, and NSPS record keeping)		$6.42	$/well
11.	Unit cost to conduct surface monitoring (NSPS)		$192.50	$/event
12.	Control System Information		N/A	
	a. number and size of blowers			
	b. flare dimensions and capacity			
	c. current flow rate			
	d. other features			
13.	Cost of electricity to run system		$0.00	$/year
14.	Cost to maintain system (including daily check, weekly charts, maintenance, etc.)		$0.00	$/year
15.	Cost of annual blower maintenance (including greasing, bearing check, and alignment)		$0.00	$/year
16.	Cost of stack testing (once per five years)			$/event
17.	Estimate the volume of condensate generated per year			gallons
18.	Cost of condensate management (including pumping, testing, and treatment/disposal			$/year
19.	Number of years to run system (30 + time to close)		31	years

20. Cost Summary -- Gas Collection System

System Installation	
a. Additional well installation (line 5 x line 3)	$238,000.00
b. Additional pumping well installation (line 4 x line 6)	$0.00
c. Cost of collection piping (line 7 x line 8)	$121,333.00
d. Well replacement (line 3 x line 9)	$0.00
e. Enclosed ground flare system (line 2)	$0.00
System Installation Subtotal	**$359,333.00**
f. Cost of monitoring/balancing (line 1 x "12" x line 10 x line 19)	$205,379
g. Cost of surface monitoring (line 11 x "1.5" x line 19)	$8,927
h. Electric Cost (line 13 x line 19)	$0.00
i. System maintenance cost (line 14 x line 19)	$0.00
j. Blower maintenance cost (line 15 x line 19)	$0.00
k. Stack testing cost (line 16 x [line 19/5])	$0.00
l. Condensate management cost (line 18 x line 19)	$0.00
System Monitoring and Maintenance Subtotal	**$214,307**

Adjustment for miscellaneous maintenance items (including; knockout pot maintenance, thermocouple replacement, flame detector replacement, flame arrester maintenance, flare maintenance, enrichment/startup gas replacement, pneumatic valve maintenance, sump maintenance, panel board maintenance, etc.)

a. Use 0% of subtotal if system[1] <2 yrs old	
b. Use 5% of subtotal if system[1] is >2 yrs old, but < 5 yrs old	
c. Use 10% if system[1] >5 years old	**$0.00**
Total	**$573,641**

Note: "N/A" used to designate PPL responsibility should costs be incurred

Worksheet H - Other Monitoring and Reporting

1.	Title V or other air permit (include the annual permit fee, cost to	$0	
2.	NSPS Annual Report preparation cost	$0	
3.	Local permit or Host Agreement requirements	$1,600	assumes 1 year only; then FFLF "closed"
4.	UST/AST registration	$0	
5.	Other (Annual Report-BLRWM)	$4,455	assumes 1 year only; then FFLF "closed"
6.	Other (AIMS Report)	$2,045	
7.	Other (Semi-annual Compliance Certification)	$1,080	
8.	Other (Quarterly LASA Report)	$2,704	
9.	Other (SRBC)	$1,720	assumes 1 year only; then FFLF "closed"
	Other (Act 220)	$515	assumes 1 year only; then FFLF "closed"
	Other (eGGRT)	$3,080	assumes 1 year only; then FFLF "closed"
10.	Number of years of monitoring/maintenance (30 + time to close)	31	
	Total	**$192,063.00**	

1.	Number of years of leachate management (30 years + closure period)	31	
2.	Annual leachate volume generated	8,448,478	gallons
3.	Annual cost to manage leachate volume (include pump and pipe maintenance, electricity and monitoring)[1]	$0.0020	
Discharge to POTW			
4.	Unit cost to discharge leachate to a POTW	$0.0064	$/gal
On-site Treatment (including pretreatment)			
5.	Unit cost for treatment of leachate (include equipment maintenance, electricity, personnel, chemicals, sludge disposal, etc.)		$/gal
6.	Annual cost to maintain NPDES permit (include sampling, analysis, report preparation, and factor in five year renewal application preparation and fees)		
Interim Trucking of Leachate			
7.	Unit cost to transport and disposal of leachate		$/gal
8.	NPDES Permit (cost to prepare application, fees, and sampling/analysis)		
9.	Cost to construct on-site treatment or pretreatment system or connection to POTW		
10.	Unit cost for treatment of leachate (include equipment maintenance, electricity, personnel, chemicals, etc.)		$/gal
11.	Annual cost to maintain NPDES permit (include sampling, analysis, report preparation, and factor in five year renewal application preparation and fees)		
12.	Cost Summary:		
	a. Cost to manage/convey leachate (line 1 x line 3)	$0.06	
	If discharge to POTW		
	b. Discharge to POTW cost (line 1 x line 2 x line 4)	$1,676,091	
	If have on-site treatment		
	c. Treatment cost (line 1 x line 2 x line 5)		
	d. NPDES maintenance cost (line 1 x line 6)		

If you currently truck leachate

e. Cost of trucking leachate for three years (line 1 x "3" x line 10 x line 12)

f. NPDES Permit (line 8)

g. Cost to construct on-site treatment system or connection to POTW (line 9)

h. Treatment cost ([line 1 - 3] x line 2 x line 10)

i. NPDES maintenance cost ([line 1 - 3] x line 11)

If you currently store leachate in impoundments

j. Size of pond		acres
k. Estimate volume of material to be removed (including liner system and minimum of 12" soil)		CY
l. Unit cost to dispose of materials (Worksheet A, line 4)		$/CY
m. Cost to dispose of materials (line k x line l)		
n. Volume of structural backfill		CY
o. Cost of backfill (line n x Worksheet B, line 8a)		
p. Revegetation cost		LS
Subtotal	**$1,676,091**	

Adjustment for maintenance, equipment replacement and contingencies, etc. Please note that these are cumulative and you must add all of the percentages that apply to arrive at the final adjustment percentage. The minimum adjustment is 10%.

a. Add 10% of subtotal if pumps are used to convey leachate.	$167,609
b. Add 5 % of subtotal if flow volume to POTW is restricted.	
c. Add 10% of subtotal if leachate is stored in ponds.	
d. Add 10% of subtotal if onsite treatment.	
e. Add 15% if trucking leachate.	
f. Add 10 % if current leachate generation exceeds 5MG/year	$167,609
Final adjustment factor: 20%	
g. Adjustment (subtotal x factor)	$335,218
Total (subtotal + adjustment)	**$2,011,308**

Bonding Worksheet J

1. Size of borrow area: 5 acres
2. Volume of material required for regrading: 8,067 CY
3. Unit cost to regrade (provide equipment and rates): $1.48 $/CY

   Are sufficients soils available to complete job?
   (list deficit amount and attach maps that identify sources and stockpiles)

4. Earthen Materials
   a. Structural Fill
      1. Stockpile: 0
      2. Borrow:

      Total: CY

   On-site: Yes / No

   Processing Required: Yes / No

   b. Unit Cost to Place[1]: $/CY

   c. Topsoil
      1. Stockpile:
      2. Borrow:

      Total: 0 CY

   On-site: Yes

   Processing Required: No

   d. Unit Cost to Place[1]: $/CY

5. Revegetation Cost

   (Seeding rate used: lbs/acre)

   (Lime rate used: tons/acre)

   (Fertilizer rate used: tons/acre)

   (Mulch rate used: tons/acre)

   Unit cost to revegetate: $1,524 $/acre

Bonding Worksheet J

6. E & S Controls		$1,136	$/acre
7. Bond Maintenance Cost (required if off-site borrow area)			LS
8. Other costs (provide detail)			
9. Cost Summary			
a. Fill/Regrading (line 2 x line 3)		$11,939	
b. Structural Fill (line 4a x line 4b)		$0	
c. Topsoil (line 4c x line 4d)		$0	
d. Revegetation (line 1 x line 5)		$7,618	
e. E & S Controls (line 6)		$5,680	
f. Bond maintenance (line 7)		$0	
g. Other (line 8)		$0	
	Subtotal	**$25,237**	
CQA/Project Management costs (use 5% of subtotal)		$1,262	
	Total	**$26,499**	

Bonding Worksheet K

1.	Size of facility	175 acres
2.	Size of waste placement footprint	102 acres
3.	Size of borrow areas on site	5 acres
4.	Size of leachate ponds on site	0 acres
5.	Size of sedimentation ponds on site	3.9 acres
6.	Length of stormwater conveyance ditches	8,500 LF
7.	Number of years of site management (30 years + closure period)	31 years
8.	Annual Cost to repair cap and final cover[1]	
	a. Acres (use 1% of line 2)	1.020 acres
	b. Unit cost[2] to repair final cover	$3,233 $/acre
	c. Unit cost[2] to repair cap	$4,311 $/acre
	d. Unit cost[2] to repair vegetation	$1,660 $/acre
	e. Total unit cost (line b + line c + line d)	$9,204 $/acre
9.	Annual Cost to repair and maintain E&S facilities[1]	
	a. Channel repair length (use 3% of line 6)	255 LF
	b. Sedimentation pond repair volume (use 20% of line 5)	0.78 acres
	c. Unit cost[2] to repair channels	$27 $/LF
	d. Unit cost[2] to repair ponds	$3,772 $/acre
	e. Total annual cost (line a x line c) + (line b x line d)	$9,813 $/YR
10.	Annual Cost to repair and maintain leachate ponds[1]	
	a. Leachate pond repair volume (use 20% of line 4)	0 acres
	b. Unit cost[2] to repair leachate pond(s)	$/acre
11.	Annual cost to repair and maintain leachate tanks	
	a. Number and size of tanks	2 1,000,0(
	b. Annual unit cost[1] to maintain tanks	$500 LS
12.	Annual cost to repair fences and gates (attach details)	$2,694 LS
13.	Annual cost to maintain site roads	
	a. Length of site roads[2]	10,500 LF
	b. Annual length of site roads to be repaired (2% of line 13a)	210 LF
	c. Unit cost to repair roads[1]	$38 $/LF

14. Cost Summary - Facility Maintenance

a. Cost to repair cap/cover (line 7 x line 8a x line 8e)	$291,036
b. Cost to maintain E&S facilities (line 7 x line 9e)	$304,207
c. Cost to maintain leachate ponds (line 7 x line 10a x line 10b)	$0
d. Cost to maintain leachate tanks (line 7 x line 11a x line 11b)	$31,000
e. Cost to repair fences and gates (line 7 x line 12)	$83,527
f. Cost to maintain site roads (line 7 x line 13b x line 13c)	$245,571.30
Subtotal	**$955,341**

1. Please refer to the instructions. This estimate should reflect unit costs to bring in a contractor to complete the work and should include mobilization, equipment cost, operator costs, material costs and clean-up and inspection costs. Costs not incurred annually should be determined and divided among the years between events. The costs should also include replacements of pumps and meters, electricity used (pumps, heat tracing, etc.) valve replacement and sludge disposal.

This should include access to all maintenance and monitoring areas including but not limited to the disposal area, ponds, leachate conveyance system, tanks, discharge locations, gas extraction system wells, gas probes, groundwater monitoring system and surface water monitoring points.

2. Adjust ment for maintenance, equipment replacement and contingencies, etc. Please note that these are cumulative and you must add all of the percentages that apply to arrive at the final adjustment percentage. The minimum adjustment is 10%.

a. Add 5% of subtotal if final slopes or benches have been modified from what is specified in 25 PA Code §273.234(f).
b. Add 5% of subtotal if more than 30% stormwater channels are unlined.
c. Add 5% of subtotal if length of site access roads exceeds 5 miles
d. Add 10% for mowing

Final adjustment factor: 15%

e. Adjustment (subtotal x factor)	$143,301
Total (subtotal + adjustment)	**$1,098,642**

Worksheet L - Cost Summary

1.	Decontaminating the Facility	$11,766
2.	Capping/Closure	$4,002,158
3.	Groundwater Monitoring System	$632,019
4.	Surface Water Monitoring	$45,519
5.	Private Water Supply Monitoring	$330,634
6.	Gas Monitoring	$84,221
7.	Gas Collection and Maintenance	$573,641
8.	Other Monitoring	$192,063
9.	Leachate Management	$2,011,308
10.	Borrow Area Closure	$26,499
11.	Maintenance Costs	$1,098,642
12.	Other Costs[1]	
13.	Other Costs[1]	
	Subtotal	$9,008,469

Inflation

14.	Inflation rate (projected inflation for the next three years based on the inflation for the prior three years).	5.00%
15.	Inflation cost for facility (subtotal x line 14)	$450,423

Contingency and administrative fees

16.	Administrative fees (5%) (Subtotal x 0.05)	$450,423
17.	Project Management (5%) (Subtotal x 0.05)	$450,423
18.	Contingency fee amount (Subtotal x rate of contingency fee from Table 1)	$644,329
	Total (subtotal + line 15 + line 16 + line 17 + line 18)	$11,004,068

Line A-4 (Cost to Dispose Waste)

	400	tons
@	50	tons/hour
=	8	hours
X	300	$/hour (2 pcs. equipment + operators)
=	$2,400	
/	400	tons
=	$6.00	$/ton
+	$6.25	/ton; PaDEP disposal fees
=	$12.25	$/ton

Line A-10 (Cost to Cover Waste)

Assumptions

2 Operators; 3 pieces of equipment

Excavator and D350 to move soil

Dozer to place soil

Operator/ Equipment cost		$200	per hour (per each operator/equip.)
Removal rate of soil cover		200	cu. yds. per hour
Placement rate of soil cover		200	cu. yds. per hour
Move Soil	so:	500	cu.yds. soil required
	@	200	cu. yds. per hour
	=	3	hours to move soil
	@	$200	per hour (per each operator/equip.)
	=	$1,000	
Place Soil		500	cu.yds.
	@	200	cu. yds. per hour
	=	3	hours to place
	@	$200	per hour (per each operator/equip.)
	=	$1,000	
Seed	=	$1,524	per Kinsley's 2010 Cell 6/Phase 4 Cap Co escolated annually for bonding p
	Total =	$3,524	
	/	500	cu.yds.
	=	$7.05	$/cu.yd.

Line C-7 (cost to purge/sample)

	1	field technicians	
@	$35.00	/hr	2021 ALSI field services rate
X	14	hours	
=	$490		
/	19	locations	
=	$26	$/location	

Line C-9 (cost to analyze)

	6	hours data review
@	$85.00	/hr (staff engineer/scientist)
=	$510	
+	2	hour (admin; complete Forms 19)
@	$45.00	/hr
=	$90.00	
+	2	hour review; project engineer
@	$95.00	/hr
=	$190.00	
+	0.5	hour review; senior engineer
@	130	$/hr
=	$65.00	
=	$855.00	$/hr
/	20	locations
=	$42.75	$/location

Line E-2 (cost to sample)

	1	field technicians	
@	35.00	$/hr	2021 ALSI field services rate
X	8	hours	
=	$280		
/	10	locations	
=	$28	$/location	

Line E-4 (cost to analyze)

	3	hours data review
@	85	$/hr (staff engineer/scientist)
=	$255	$/hr
+	1.5	hour (admin; complete Forms 52)
@	45	$/hr
=	$68	$/hr
+	1	hour review; project engineer
@	95	$/hr
=	$95	$/hr
=	$418	$/hr
/	10	locations
=	$42	$/location

Bonding Worksheet G Backup

LFG Monitoring Costs

	3.5	hrs./monitoring event
X	$55.00	$/hr
/	30	wells
=	$6.42	$/well

Surface Monitoring Costs

	3.5	hrs./monitoring event
X	$55.00	$/hr
=	$192.50	

LFG Probe Monitoring Costs (Worksheet F)

	3.5	hrs./monitoring event
X	$55.00	$/hr
=	$192.50	
# probes	8	
=	$24.06	/probe

Line H-3 (Host Agreement)

	2	hours data review
@	85	$/hr (staff engineer/scientist)
=	$170	
+	1	hours (admin; complete forms)
@	45	$/hr
=	$45	
+	1	hour; senior engineer
@	130	$/hr
=	$130	
+	$55	admin. supplies
=	$400	/ quarter
=	$1,600	/ year

Line H-5 (Annual Report)

	8	hours data review
@	85	$/hr (staff engineer/scientist)
=	$680	
	$8	hours CADD operator
@	85	$/hr (staff engineer/scientist)
	$680	
+	2	hours (admin; complete forms)
@	45	$/hr
=	$90	
+	1	hour; senior engineer
@	130	$/hr
=	$130	
+	$2,800	annual report fee
+	$75	admin. supplies
=	$4,455	

Line H-6 (AIMS)

	18	hours data review
@	85	$/hr (staff engineer/scientist)
=	$1,530	
+	4	hours (admin; complete forms)
@	45	$/hr
=	$180	
+	2	hours; senior engineer
@	130	$/hr
=	$260	
+	$75	admin. supplies
=	$2,045	

Line H-7 (Semi-Annual Compliance)

	4	hours data review
@	85	$/hr (staff engineer/scientist)
=	$340	
+	1	hours (admin; complete forms)
@	45	$/hr
=	$45	
+	1	hour; senior engineer
@	130	$/hr
=	$130	
+	$25	admin. supplies
=	$540	/ event
=	$1,080	/ year

Line H-8 (LASA Report)

	3	hours data review
@	85	$/hr (staff engineer/scientist)
=	$255	
+	1.5	hours (admin; complete forms)
@	45	$/hr
=	$68	
+	1	hour; senior engineer
@	130	$/hr
=	$130	
+	$136	LASA parameters lab test
=	$589	/ event
X	4	(quarterly)
+	1	LASA sampling event
@	$350	
=	$2,704	/ year

Line H-9 (LASA Chapter 94 Report)

	12	hours data review
@	85	$/hr (staff engineer/scientist)
=	$1,020	
+	2	hours (admin; complete forms)
@	45	$/hr
=	$90	
+	1	hour; senior engineer
@	130	$/hr
=	$130	
=	$0	/ year

Line H-9 (Other; SRBC)

	3	hours data review / quarter
@	85	$/hr (staff engineer/scientist)

=	$255	
+	1	hours (admin; complete forms) / quarter
@	45	$/hr
=	$45	
+	1	hour; senior engineer / quarter
@	130	$/hr
=	$130	
=	$430	/quarter
=	$1,720	/year

Line H-9 (Other; Act 220 Report)

	4	hours data review
@	85	$/hr (staff engineer/scientist)
=	$340	
+	1	hours (admin; complete forms)
@	45	$/hr
=	$45	
+	1	hour; senior engineer
@	130	$/hr
=	$130	
=	$515	/ year

Line I-4 (Unit Cost)

	19,453	gallons per day	
	591,696	gallons per month	
LASA Rates	$105.15	first 21,500 gallons	} LASA rates
	$4.50	/1,000 gallons; from 78,500 gallons	
	$4.50	/1,000 gallons; next 400,000 gallons	
	$3.79	/1,000 gallons; next 500,000 gallons	
so	$105.15	first 21,500 gallons	
+	$353.25	next 78,500 gallons	
+	$1,800	from 100,000 to 500,000	
+	$348	remaining gallons	
=	$2,605.93	LASA fees	
Pumping costs	440	gpm pump rate	
=	22	hours	
@	$2.25	/hour pump costs	
=	$50.43	pump costs	
with	1	LASA parameters lab test	
@	$136.00		
and	1	staff engineer	
@	85	$/hr	
X	1	hours	
=	$85		
= Total Costs	$2,786.69	per month	
/	591,696	gallons	
=	$0.0047	$/gallon	
or	$4.71	per thousand gallons	
	7,100,353	gal/yr	
=	$33,440	est. $/yr	
+	$12,000	est. $/yr (surcharges)	
=	$45,440	total $/yr	
=	$0.0064	est. $/gal.	

Attachment 4

CERTIFICATES OF INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
03/15/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

Holder Identifier :

PRODUCER
Aon Risk Services Central, Inc.
Chicago IL Office
200 East Randolph
Chicago IL 60601 USA

CONTACT NAME:
PHONE (A/C. No. Ext): (866) 283-7122 **FAX (A/C. No.):** (800) 363-0105
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: Zurich American Ins Co	16535
INSURER B:	
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
Lancaster County Solid Waste
Management Authority
1299 Harrisburg Ave.
Lancaster PA 176032515 USA

COVERAGES **CERTIFICATE NUMBER:** 570092007973 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC OTHER:			GL0437324514	04/01/2022	04/01/2023	EACH OCCURRENCE	$2,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$500,000
							MED EXP (Any one person)	$10,000
							PERSONAL & ADV INJURY	$2,000,000
							GENERAL AGGREGATE	$4,000,000
							PRODUCTS - COMP/OP AGG	$4,000,000
A	**AUTOMOBILE LIABILITY** X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			BAP 4373246-14	04/01/2022	04/01/2023	COMBINED SINGLE LIMIT (Ea accident)	$2,000,000
							BODILY INJURY (Per person)	
							BODILY INJURY (Per accident)	
							PROPERTY DAMAGE (Per accident)	
	UMBRELLA LIAB OCCUR **EXCESS LIAB** CLAIMS-MADE DED RETENTION						EACH OCCURRENCE	
							AGGREGATE	
A	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WC437324414	04/01/2022	04/01/2023	X PER STATUTE OTH-ER	
							E.L. EACH ACCIDENT	$1,000,000
							E.L. DISEASE-EA EMPLOYEE	$1,000,000
							E.L. DISEASE-POLICY LIMIT	$1,000,000

Certificate No : 570092007973

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Creswell Landfill Permit #100008, Manor Township, Lancaster County, PA, Frey Farm Landfill Permit #101389, Manor Township, Lancaster County, PA, Transfer Station Permit #10009, Manheim Township, Lancaster County, PA, Resource Recovery Facility, Permit #400592, Conoy Township, Lancaster County, PA, Frey Farm Landfill Treatment Plant, Permit #301317, Manor Township, Lancaster County, PA, SRMC City of Harrisburg Permit #100758, SRMC Ash Landfill A City of Harrisburg Permit #100759, SRMC Ash Landfill B City of Harrisburg/Dauphin County Permit #100992. Certificate Holder is included as Additional Insured in accordance with the policy provisions of the general liability policy.

CERTIFICATE HOLDER

PA Dept of Environmental Protection
Bureau of Waste Management
PO Box 8471, 14th Floor
Rachel Carson State Office Building
Harrisburg PA 17105-8471 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Central Inc.

Attachment 5

TOPOGRAPHIC MAPS AND DRAWINGS

1. ***Topographic Map Update***
   Enclosed are Drawings titled: "2020 Topographic Survey" and "2021 Topographic Survey", which displays the topography of the landfill at the beginning and end of calendar year 2020 and 2021.

2. ***Isopach Drawing***
   Enclosed is Drawing titled: "Isopach", which indicates the cut or fill to reach final permitted elevation of the landfill on a 50' grid.

3. ***Cross Sections***
   Enclosed is Drawing titled: "Cross Sections" (four sheets), which show top of protective cover, grades at the beginning and end of the report period, and permitted final cover grades at 50 foot intervals across areas of the landfill that were active during calendar year 2021.

NOTES:

1. EXISTING TOPOGRAPHY HAS BEEN CREATED FROM AN AERIAL SURVEY PROVIDED BY DAVID MILLER ASSOCIATES, INC., DATED: 12/29/2020.
2. THIS SHEET WAS ORIGINALLY PRODUCED AS A COLOR DRAWING. NON-COLOR REPRODUCTIONS DO NOT SUFFICIENTLY DIFFERENTIATE AMONG FEATURES DEPICTED ON THIS DRAWING.

LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (FT.)
- EXISTING PROPERTY BOUNDARY
- EXISTING LANDFILL CELL BOUNDARY
- EXISTING BUILDING / STRUCTURE
- EXISTING OVERHEAD ELECTRIC
- EXISTING PPL TOWER
- EXISTING PPL EASEMENT
- EXISTING SEDIMENT BASIN
- EXISTING ANCHOR TRENCH
- LANDFILL CROSS-SECTION

CELL 1
CELL 2
CELL 3
CELL 4
CELL 5
CELL 6

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078078

ARM Group LLC
Engineers and Scientists
www.armgroup.net

No.	Revision	Date	By

scale: 1" = 100'
date: 05/20/2022
project no.: 22010663

designed	ARM
checked	DNF
drawn	BAA
graphic scale	0 100 200 SCALE IN FEET

drawing title:
2020 TOPOGRAPHIC SURVEY
2021 ANNUAL OPERATIONS REPORT

project title:
LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY

MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

Sheet 1

Z:\LCSWMA\22010663 FY22 2021 AOR\Dwg Production_AOR Drawing Set\22010663-SS01_2020 Topographic Survey.dwg Plotted: June 15, 2022

NOTES:

1. EXISTING TOPOGRAPHY HAS BEEN CREATED FROM AN AERIAL SURVEY PROVIDED BY DAVID MILLER/ASSOCIATES, INC., FLIGHT DATED: 01/06/2022.
2. THIS SHEET WAS ORIGINALLY PRODUCED AS A COLOR DRAWING. NON-COLOR REPRODUCTIONS DO NOT SUFFICIENTLY DIFFERENTIATE AMONG FEATURES DEPICTED ON THIS DRAWING.

LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (FT.)
- EXISTING PROPERTY BOUNDARY
- EXISTING LANDFILL CELL BOUNDARY
- EXISTING BUILDING / STRUCTURE
- EXISTING OVERHEAD ELECTRIC
- EXISTING PPL TOWER
- EXISTING PPL EASEMENT
- EXISTING SEDIMENT BASIN
- EXISTING ANCHOR TRENCH
- LANDFILL CROSS-SECTION

CELL 1
CELL 2
CELL 3
CELL 4
CELL 5
CELL 6

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No.	Revision	Date	By

scale	1" = 100'
date	05/20/2022
project no.	22010663

SCALE IN FEET
0 100 200

designed	ARM
checked	DNF
drawn	BAA
graphic scale	

2021 TOPOGRAPHIC SURVEY
2021 ANNUAL OPERATIONS REPORT
MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

project title: LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY

drawing title: Sheet 2

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078678

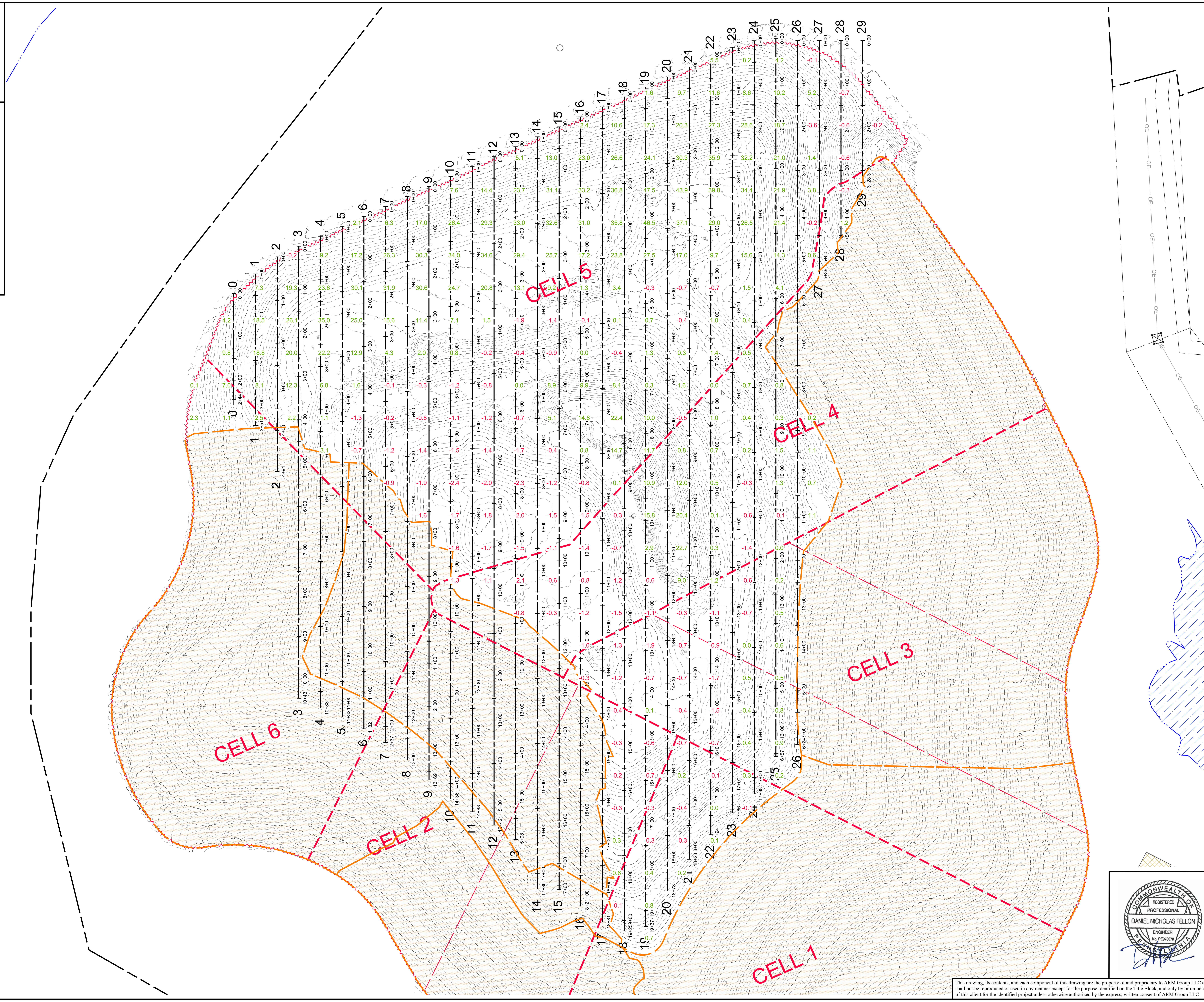
F:\LCSWMA\22010663\FILE 2021 AOR\Dwg Production _AOR\Drawing Set\22010663-SR02_2021 Topographic Survey.dwg Printed: June 13, 2022

NOTES:

1. EXISTING TOPOGRAPHY HAS BEEN CREATED FROM AN AERIAL SURVEY PROVIDED BY DAVID MILLER/ASSOCIATES, INC., FLIGHT DATED: 01/06/2022.
2. GRID OF TICKS ISOPACH REPRESENTS THE DIFFERENCE IN ELEVATIONS BETWEEN THE 12/29/2020 AERIAL SURVEY PROVIDED BY DAVID MILLER/ASSOCIATES, INC. AND THE 01/06/2022 DRONE AERIAL SURVEY PROVIDED BY DAVID MILLER/ASSOCIATES, INC.
3. THIS SHEET WAS ORIGINALLY PRODUCED AS A COLOR DRAWING. NON-COLOR REPRODUCTIONS DO NOT SUFFICIENTLY DIFFERENTIATE AMONG FEATURES DEPICTED ON THIS DRAWING.

LEGEND

—1000—	EXISTING GROUND SURFACE ELEVATION CONTOURS (FT.)
	EXISTING PROPERTY BOUNDARY
	EXISTING LANDFILL CELL BOUNDARY
▨	EXISTING BUILDING / STRUCTURE
OE OE	EXISTING OVERHEAD ELECTRIC
☒	EXISTING PPL TOWER
	EXISTING PPL EASEMENT
▨	EXISTING SEDIMENT BASIN
	EXISTING ANCHOR TRENCH
12	LANDFILL CROSS-SECTION
	EXISTING CAPPED AREAS
15.3	DEPTH OF FEET OF FILL BETWEEN THE PREVIOUS EXISTING GROUND SURVEY (12/29/2020) AND THE CURRENT EXISTING GROUND SURVEY (01/06/2022)



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No.	Revision	Date	By

designed	ARM	scale	1" = 100'
checked	DNF	date	05/20/2022
drawn	BAA	project no.	22010663

graphic scale: 0 100 200 300 SCALE IN FEET

drawing title: ISOPACH
2021 ANNUAL OPERATIONS REPORT

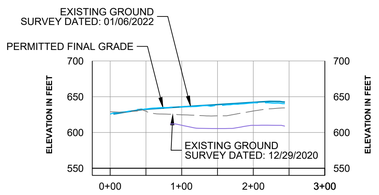
project title: LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY
MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078678

[illegible]

Sheet 3

P:\LCSWMA\22010663 FFLF 2021 AOR\Drwg\Production_AOR-Drawing Set\22010663-Sh03_Isopach.dwg Plotted: June 15, 2022



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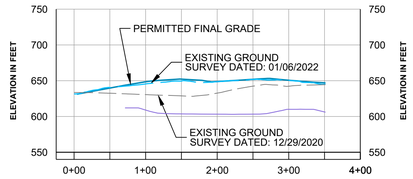
VERTICAL SCALE: 1"=100'



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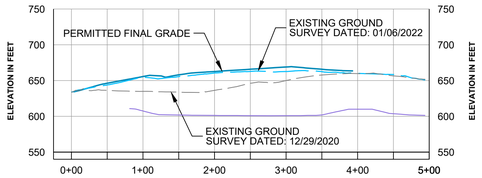
VERTICAL SCALE: 1"=100'



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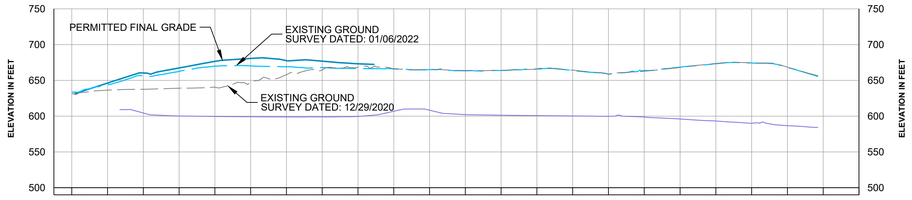
VERTICAL SCALE: 1"=100'

LEGEND

- 2020 AERIAL SURVEY GRADE
- 2021 AERIAL SURVEY GRADE
- PERMITTED FINAL GRADE
- EXISTING LINED SUBGRADE



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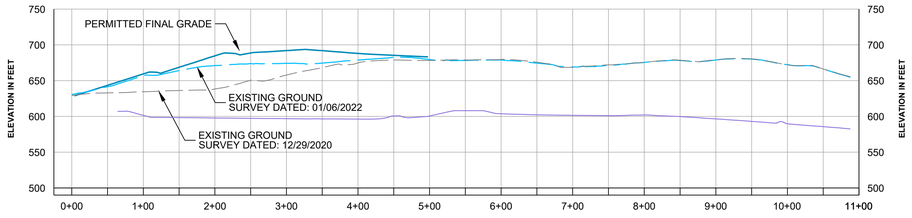

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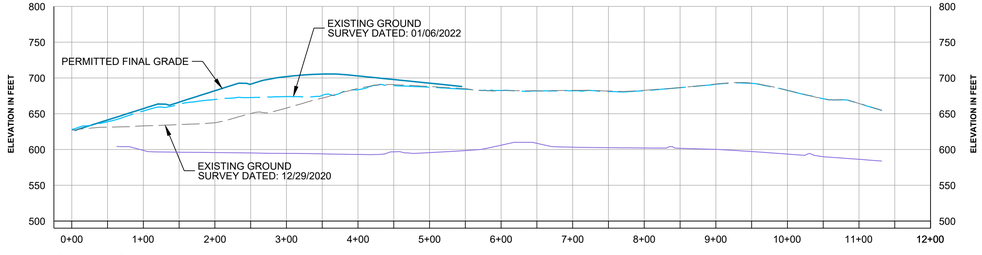
VERTICAL SCALE: 1"=100'



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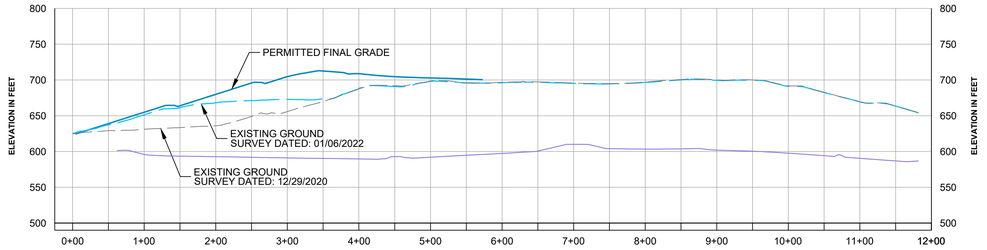

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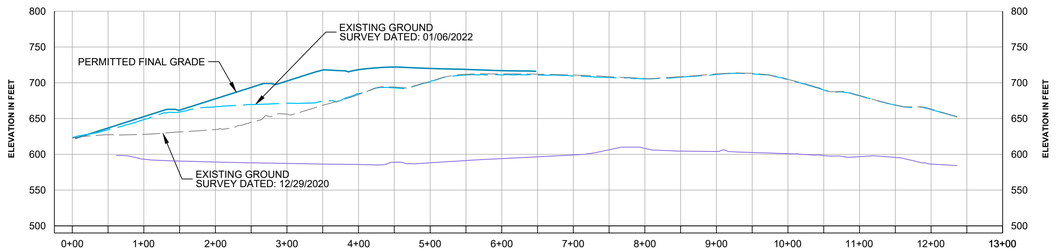
VERTICAL SCALE: 1"=100'



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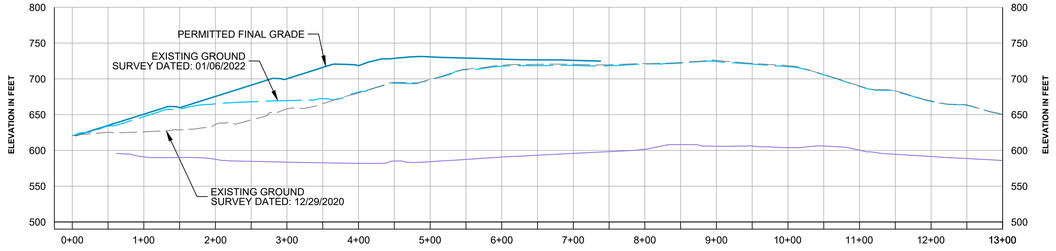
VERTICAL SCALE: 1"=100'



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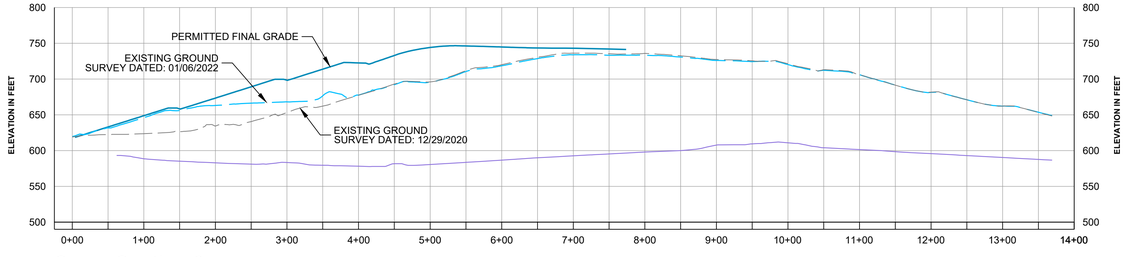

Cross Section 9
HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=100'

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078676

ARM Group LLC
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No.	Revision	Date	By

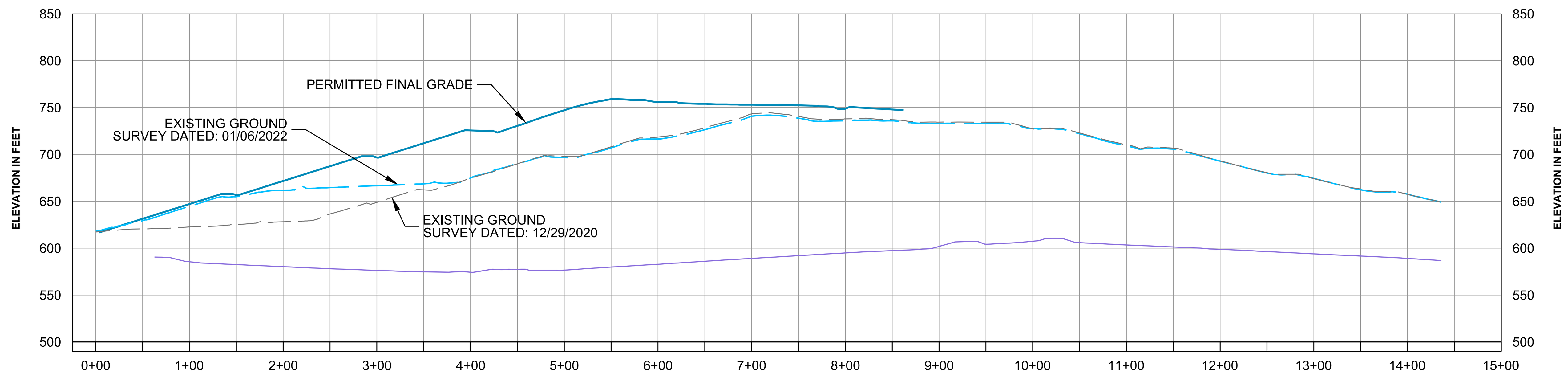
designed ARM
checked DNF
drawn BAA
graphic scale
scale AS NOTED
date 05/20/2022
project no. 22010663

drawing title
CROSS SECTIONS (SHEET 1 OF 6)
2021 ANNUAL OPERATIONS REPORT

project title
LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY

MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

Sheet 4



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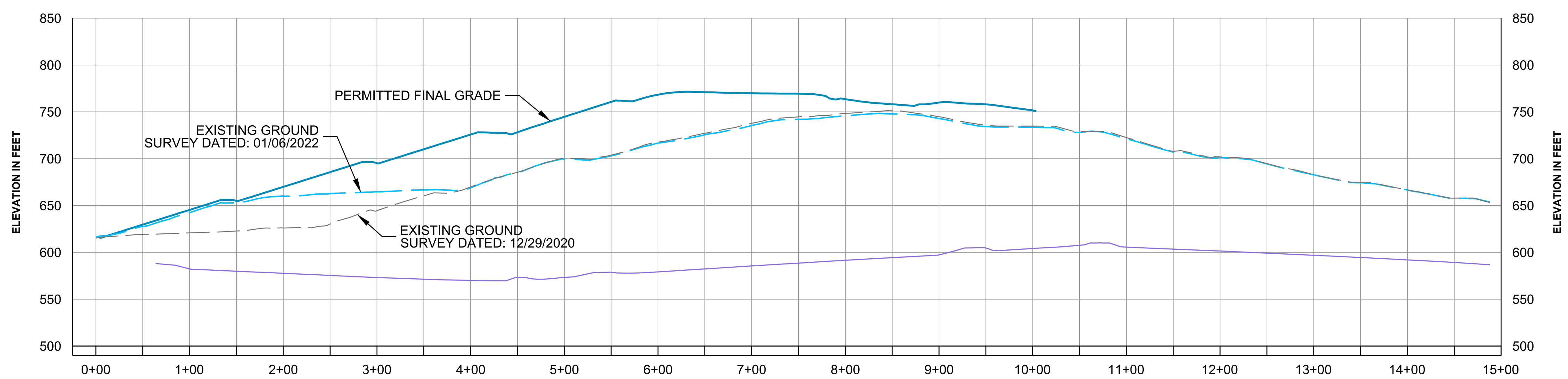

Cross Section 11
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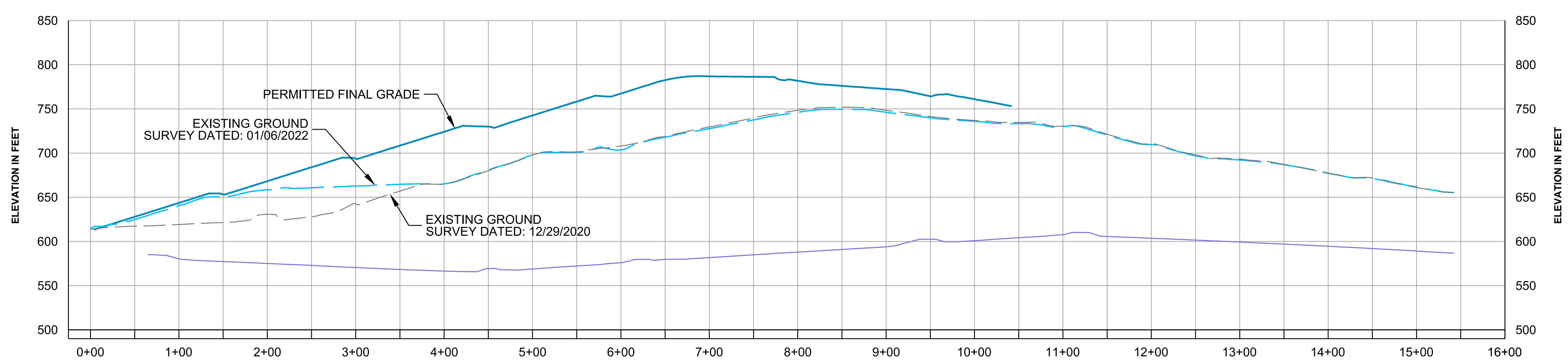

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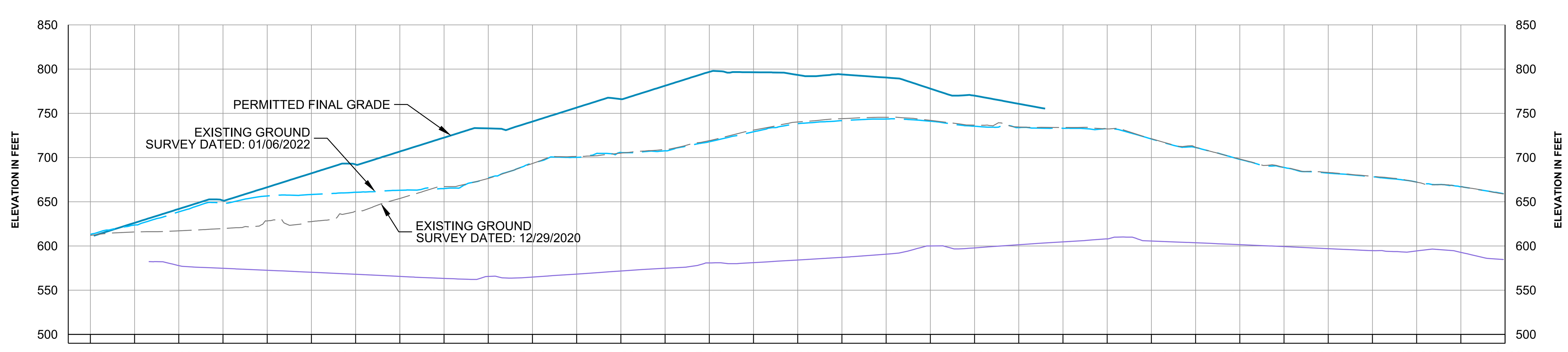

Cross Section 13
HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=100'

LEGEND

- – – – – 2020 AERIAL SURVEY GRADE
- — — — 2021 AERIAL SURVEY GRADE
- ——— PERMITTED FINAL GRADE
- ——— EXISTING LINED SUBGRADE

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No.	Revision	Date	By

designed	ARM	scale	AS NOTED
checked	DNF	date	05/20/2022
drawn	BAA	project no.	22010663
graphic scale			

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078678

[illegible]

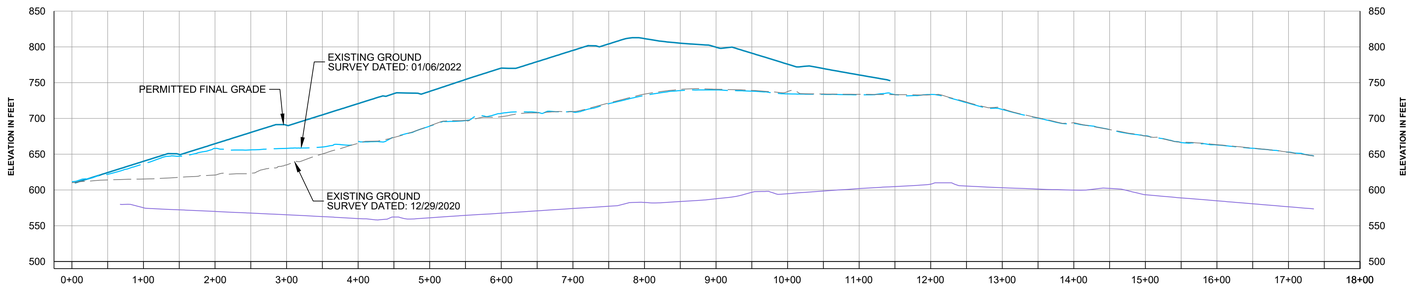
drawing title
CROSS SECTIONS (SHEET 2 OF 6)
2021 ANNUAL OPERATIONS REPORT

project title
LANCASTER COUNTY SOLID WASTE
MANAGEMENT AUTHORITY

MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

Sheet
5

P:\LCSWMA\22010663 FFLF 2021 AOR\Drwg\Production_AOR-Drawing Set\22010663-Sh04_Cross Sections.dwg Plotted: June 15, 2022



LEGEND

- 2020 AERIAL SURVEY GRADE
- 2021 AERIAL SURVEY GRADE
- PERMITTED FINAL GRADE
- EXISTING LINED SUBGRADE

Cross Section 14

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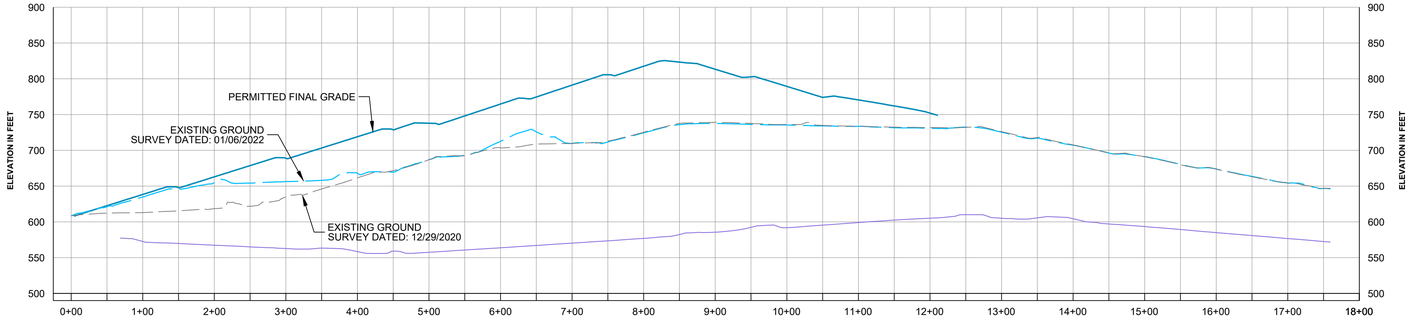
VERTICAL SCALE: 1"=100'



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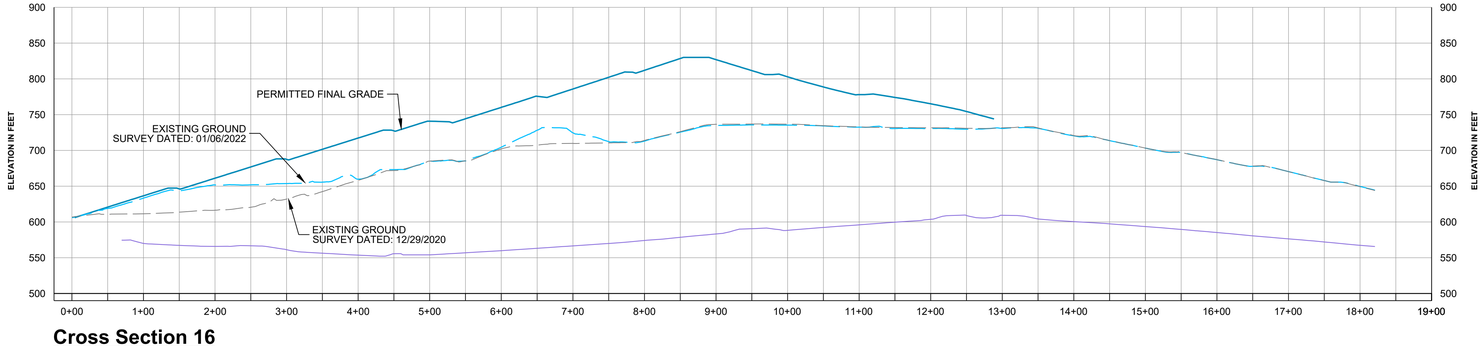

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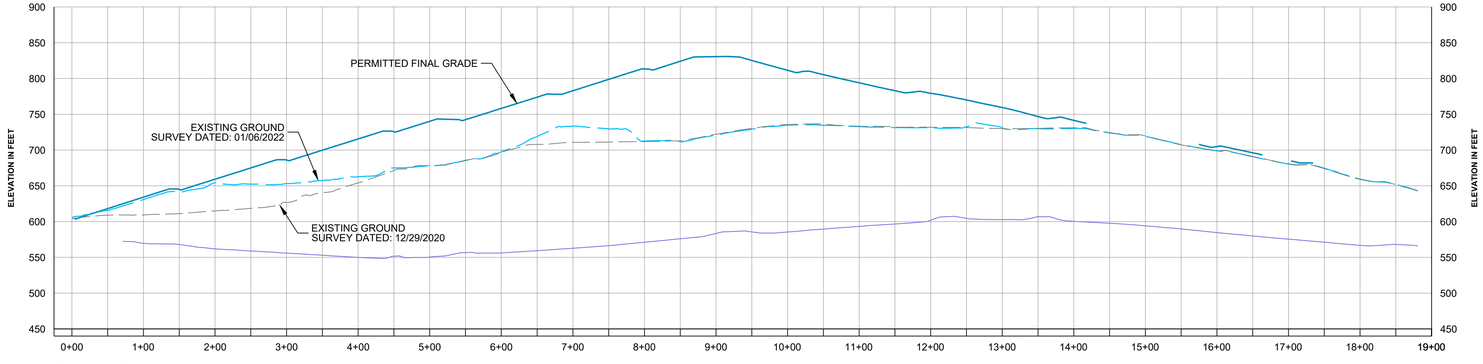
VERTICAL SCALE: 1"=100'



Cross Section 17

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=100'

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No.	Revision	Date	By

designed ARM
checked DNF
drawn BAA
graphic scale
scale AS NOTED
date 05/20/2022
project no. 22010663

CROSS SECTIONS (SHEET 3 OF 6)
2021 ANNUAL OPERATIONS REPORT

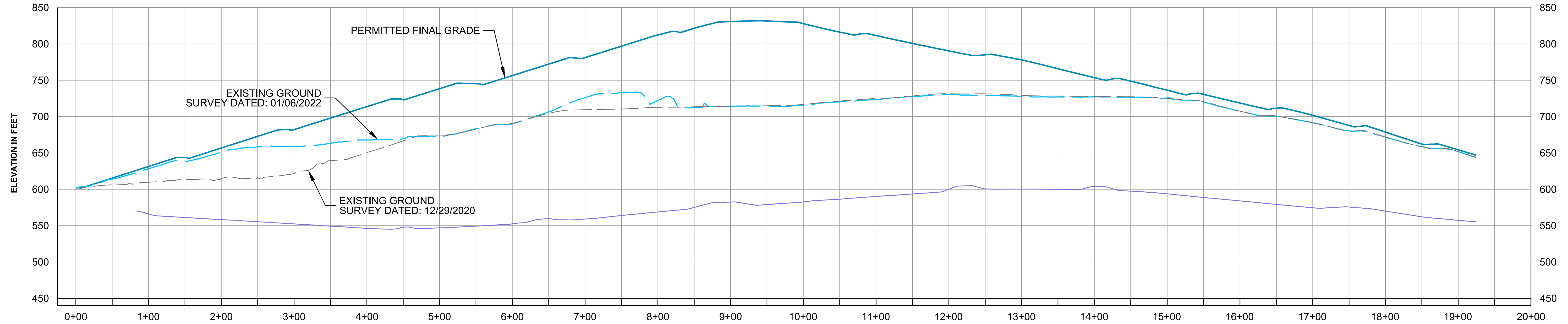
MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

project title
LANCASTER COUNTY SOLID WASTE
MANAGEMENT AUTHORITY

drawing title

Sheet 6

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078676


PERMITTED FINAL GRADE
EXISTING GROUND
SURVEY DATED: 01/06/2022
EXISTING GROUND
SURVEY DATED: 12/29/2020
ELEVATION IN FEET
850 800 750 700 650 600 550 500 450
0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

<u>Cross Section 18</u>
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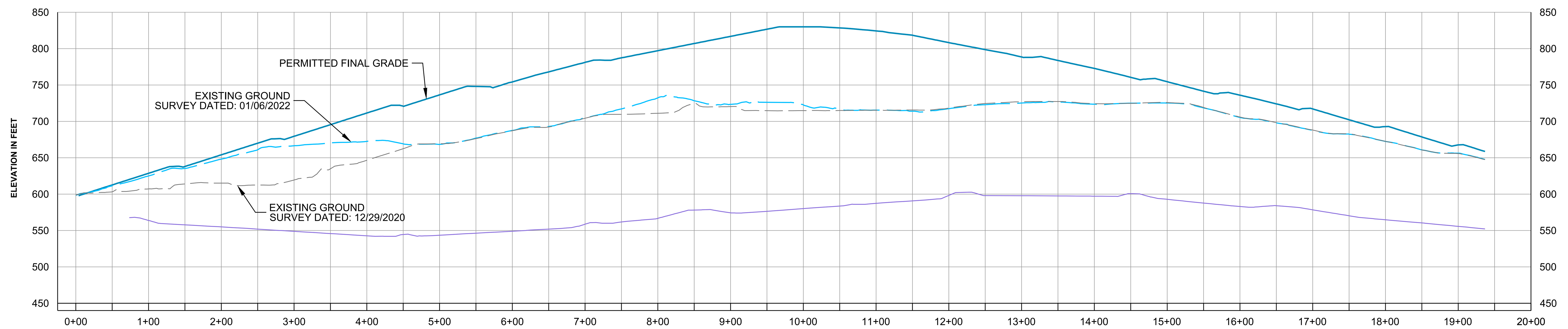
PERMITTED FINAL GRADE
EXISTING GROUND
SURVEY DATED: 01/06/2022
EXISTING GROUND
SURVEY DATED: 12/29/2020
ELEVATION IN FEET
850 800 750 700 650 600 550 500 450
0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

<u>Cross Section 19</u>
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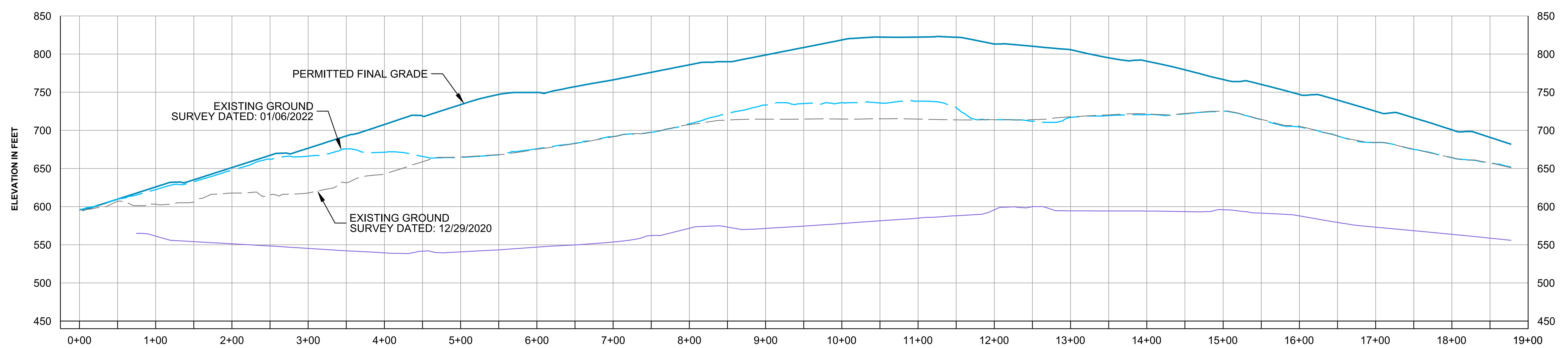
VERTICAL SCALE: 1"=100'



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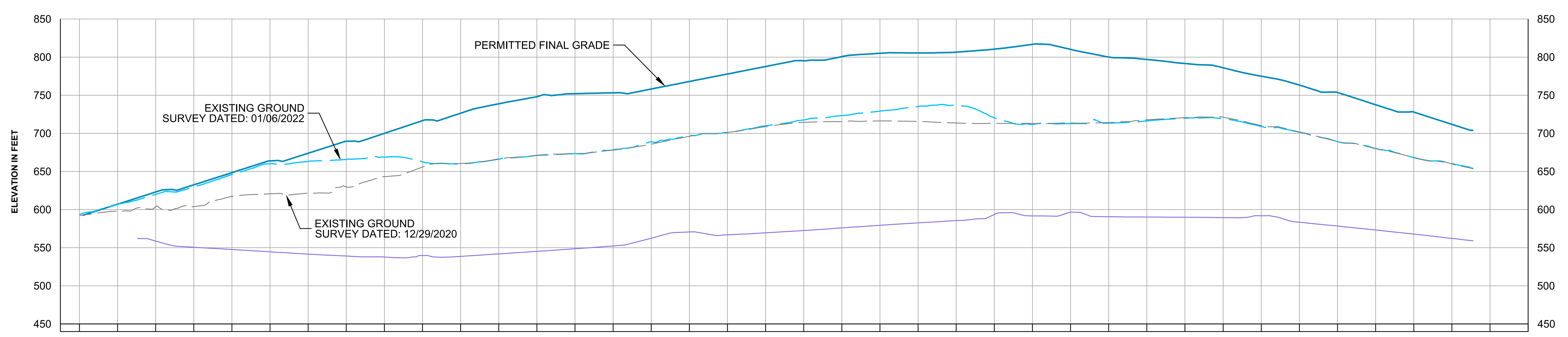
VERTICAL SCALE: 1"=100'



<u>Cross Section 21</u>
HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=100'

<u>LEGEND</u>

- — — — 2020 AERIAL SURVEY GRADE
- — — — 2021 AERIAL SURVEY GRADE
- —— PERMITTED FINAL GRADE
- —— EXISTING LINED SUBGRADE

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No.	Revision	Date	By

scale	AS NOTED	designed	ARM
date	05/20/2022	checked	DNF
project no.	22010663	drawn	BAA
		graphic scale	

drawing title
CROSS SECTIONS (SHEET 4 OF 6)
2021 ANNUAL OPERATIONS REPORT

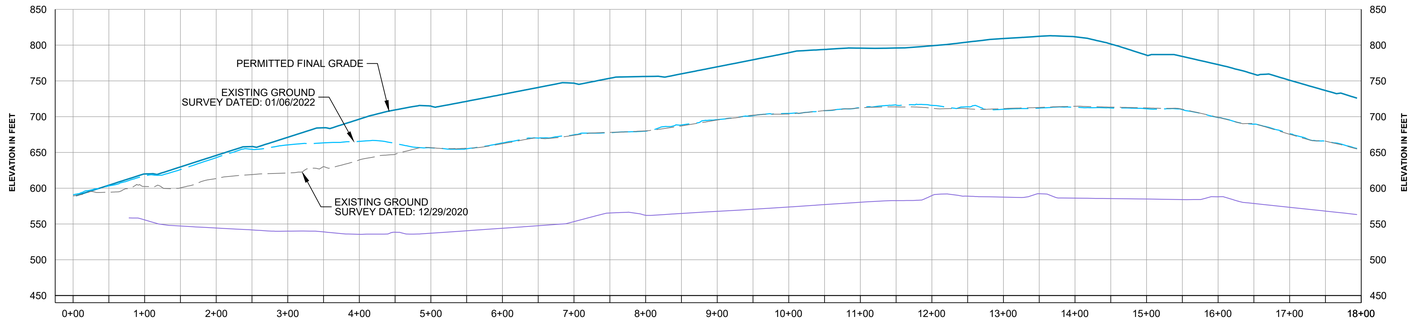
project title
LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY
MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078678

[illegible]

Sheet 7

P:\LCSWMA\22010663 FFLF 2021 AOR\Drwg\Production_AOR-Drawing Set\22010663-Sh04_Cross Sections.dwg Plotted: June 15, 2022



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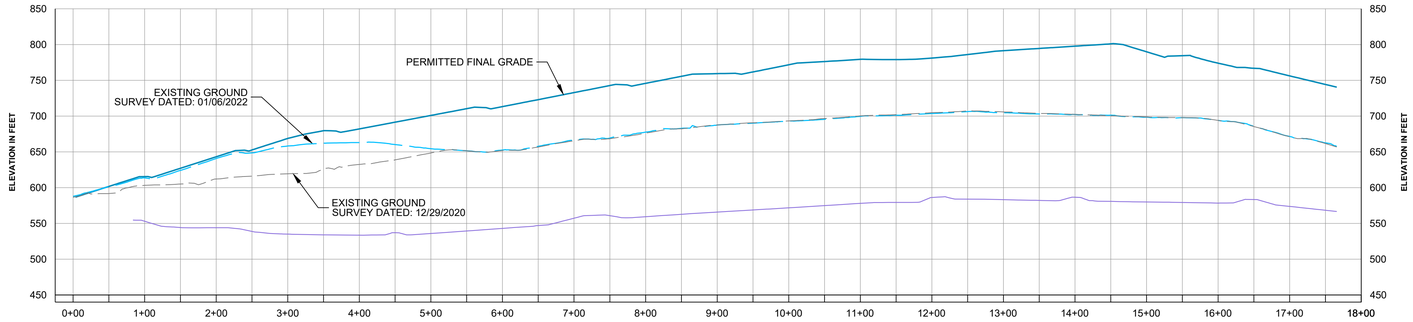
VERTICAL SCALE: 1"=100'



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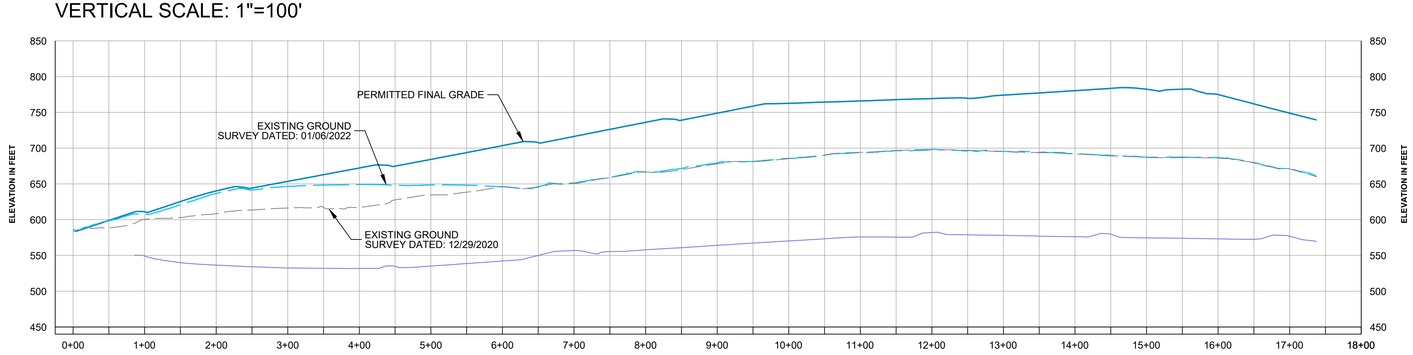

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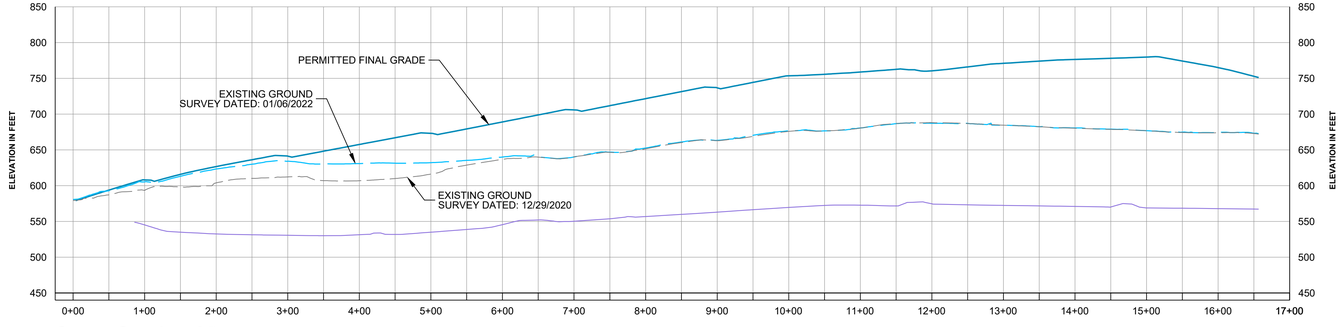

Cross Section 25
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VERTICAL SCALE: 1"=100'

LEGEND

- 2020 AERIAL SURVEY GRADE
- 2021 AERIAL SURVEY GRADE
- PERMITTED FINAL GRADE
- EXISTING LINED SUBGRADE

ARM Group LLC
Engineers and Scientists
www.armgroup.net

No.	Revision	Date	By

designed ARM
checked DNF
drawn BAA
scale AS NOTED
date 05/20/2022
project no. 22010663

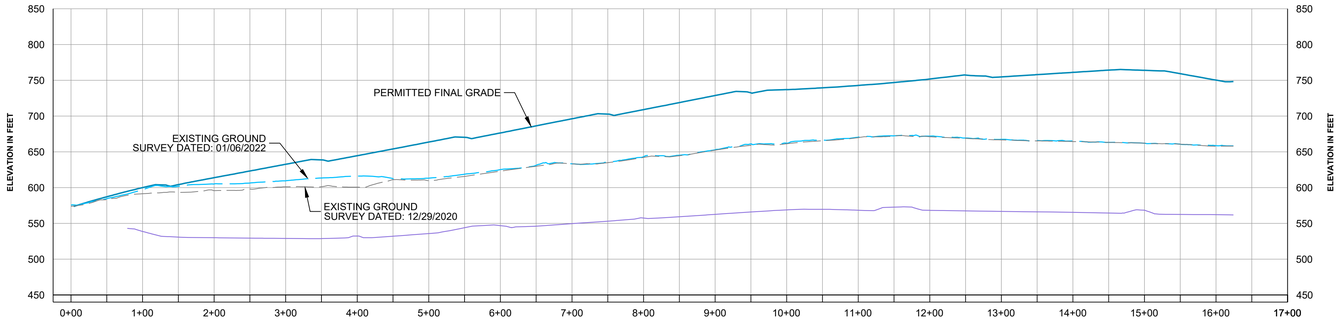
CROSS SECTIONS (SHEET 5 OF 6)
2021 ANNUAL OPERATIONS REPORT
MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

project title
LANCASTER COUNTY SOLID WASTE
MANAGEMENT AUTHORITY

drawing title

Sheet 8

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078276



Cross Section 26
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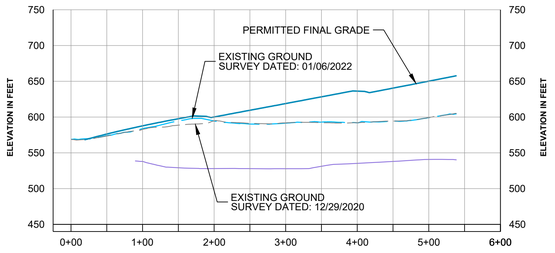
VERTICAL SCALE: 1"=100'



Cross Section 27
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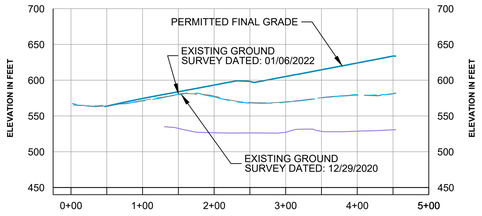
VERTICAL SCALE: 1"=100'



Cross Section 28
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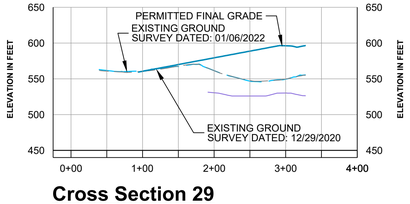
VERTICAL SCALE: 1"=100'



Cross Section 29
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VERTICAL SCALE: 1"=100'

LEGEND

- 2020 AERIAL SURVEY GRADE
- 2021 AERIAL SURVEY GRADE
- PERMITTED FINAL GRADE
- EXISTING LINED SUBGRADE

ARM Group LLC
Engineers and Scientists
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No.	Revision	Date	By

designed	ARM
checked	DNF
drawn	BAA
graphic scale	
scale	AS NOTED
date	05/20/2022
project no.	22010663

CROSS SECTIONS (SHEET 6 OF 6)
2021 ANNUAL OPERATIONS REPORT
drawing title

MANOR TOWNSHIP
LANCASTER COUNTY, PENNSYLVANIA

project title
LANCASTER COUNTY SOLID WASTE
MANAGEMENT AUTHORITY

Sheet 9

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL NICHOLAS FELLON
ENGINEER
No. PE078275

I:\LCSWMA\22010663\1113 2021 AOR\Dwg\Production_AOR.dwg Set:22010663-XSbld_Cross Sections.dwg Plotted: June 13, 2022

Attachment 6

Annual MSE Berm Inspection Report

2021 ANNUAL MSE BERM REPORT

FREY FARM LANDFILL

Prepared for:

Lancaster County Solid Waste Management Authority
1299 Harrisburg Pike
Lancaster, PA 17603

Prepared By:

ARM Group LLC
1129 West Governor Road
P.O. Box 797
Hershey, PA 17033-0797

June 2022

ARM Project 22010663

Respectfully submitted:

ARM Group LLC

Benjamin S. Allen, P.E.
Senior Engineer

INTRODUCTION

On July 26, 2017 the Pennsylvania Department of Environmental Protection (PADEP) issued an approval of the Lancaster County Solid Waste Management Authority's (LCSWMA's) Major Permit Modification for the Vertical Expansion of the Frey Farm Landfill (i.e., the FFVE). As part of the approved FFVE, a mechanically stabilized earth (MSE) berm is to be constructed around the northern, eastern, and southern perimeter of the existing Frey Farm Landfill (FFLF). Per the PADEP Permit, Permit Condition 5 requires an annual inspection report of the MSE berm to be completed by a Pennsylvania-licensed Professional Engineer and submitted with the Annual Operations Report. This report satisfies Permit Condition 5.

In addition to Permit Condition 5, the FFLF Operation Plan (i.e., Form 14) outlines the inspection and monitoring requirements for the MSE berm. The inspection and monitoring requirements include the following items:

- Annual inspection by a Professional Engineer meeting the minimum experience requirements;
- Completion of the approved MSE Berm Inspection Form;
- Photographic documentation of the annual inspection; and
- Evaluation of survey control point data to determine displacement.

The report included herein satisfies all of the inspection and monitoring requirements outlined within the PADEP Permit and the FFLF Operations Plan.

In 2017-2018, LCSWMA constructed the FFVE Stage 1 MSE berm. The FFVE Stage 1 MSE berm consisted of 2,188 linear feet of MSE berm, primarily located along the northern perimeter of the existing FFLF. During this stage of construction, the maximum height of the berm (at the face of the berm) was approximately 35 feet. The information included herein is related to the FFVE Stage 1 MSE berm, which was the only portion of MSE berm constructed at the end of 2021.

INSPECTION

On December 16, 2021, Benjamin S. Allen, P.E. of ARM Group LLC (ARM) completed the annual inspection of the FFVE Stage 1 MSE berm. Mr. Allen is a Professional Engineer licensed in the Commonwealth of Pennsylvania who specializes in geotechnical engineering and the design and construction of MSE berms. Mr. Allen has over 11 years of experience in the field of geotechnical engineering and with MSE berms. Additionally, Mr. Allen was one of the Engineers-of-Record for the FFVE Major Permit Modification that was submitted to and approved by PADEP.

During the inspection, Mr. Allen walked along the top of the MSE berm and along the toe of the MSE berm to evaluate the performance of the berm and determine if maintenance is required. In particular, the inspection assessed/evaluated the following items:

- Stormwater management controls
- Erosion
- Vegetation
- Biaxial geogrid
- MSE Berm penetrations (posts)
- Road surface
- Safety fence and guiderail

In addition to assessing/evaluating the items listed above, the inspection also looked for the presence of the following items, which could require remedial action if discovered:

- Tension cracks
- Toe heaving
- Bulging/sagging
- Animal damage
- Vandalism

While conducting the inspection, the MSE Berm Inspection Form was completed and photographs were taken. The completed form is included in Attachment A. A photo log documenting the condition of the MSE berm at the time of the inspection is included in Attachment B. Overall, the FFVE Stage 1 MSE berm is in good condition. The vegetation on the face of the berm was dormant during the time of the inspection; however, the vegetation appears to provide adequate shading for the biaxial geogrid. The biaxial geogrid appears to be intact with no damage or degradation. No signs of instability or any items requiring remedial action were observed during the inspection.

MONITORING DATA

Several survey monitoring points have been installed along the FFVE Stage 1 MSE berm. A series of survey monitoring points are generally installed every 200 feet along the length of the berm. At each location, the control monuments are typically installed at the toe of the MSE berm, the top outside edge of the MSE berm, and at the top of the berm along the stormwater channel. Additionally, at one location where the berm height exceeds 30 feet, a survey monitoring point was installed within the face of the MSE berm, between the top outside edge and toe monitoring points. In total, the FFVE Stage 1 MSE berm has 37 monitoring points. A plan view showing the location of the monitoring points is included in Attachment C.

The monitoring points are surveyed on an annual basis. To date, three survey events have been completed by David Miller/Associates, Inc. (DMA). The initial survey was completed on May 5, 2019. The survey has been conducted on an annual basis with the latest survey completed on January 6, 2022. ARM has reviewed the monitoring point surveys and has calculated the change in elevation at each point and the magnitude of total lateral displacement between the surveys.

In general, the lateral displacement displayed by the monitoring points is generally very minimal. The average lateral displacement observed during the reporting period (i.e., between the December 22, 2020 survey and the January 6, 2022 survey) is 0.49 inches and the average total lateral displacement observed (i.e., between the May 5, 2019 and January 6, 2022 survey) is 0.80 inches. Based on the survey data, the lateral displacement observed at the monitoring points is minimal and is not indicative of any type of instability. The magnitude of total lateral displacement at each monitoring point is provided in Table 1 and the magnitude of lateral displacement between the two most recent surveys (i.e., December 22, 2020 and January 6, 2022) is provided in Table 2, below. Additionally, the plan view included in Attachment C provides vectors showing the direction of lateral displacement for any point that observed more than 0.50 inches of movement during the reporting period (i.e., see Table 2).

It should be noted that the reported lateral displacement at STA 24+00, MSE berm face (i.e., survey monument embedded in the face of the MSE berm) was 2.47 inches during the reporting period. Construction activities for the FFVE Stage 2 construction were on-going in this vicinity during the reporting period and may have inadvertently impacted the monitoring point in this area. This area will continue to be monitored, but there is no evidence of instability in this area.

Table 1: FFVE Stage 1 Monitoring Point Displacement Summary Table
TOTAL MOVEMENT

STA	Location	Original Elevation	Elevation Change (in)	Magnitude of Plan View Movement (in)
06+02	toe	618.16	0.24	0.84
06+68	toe	615.44	-0.12	1.20
06+68	top, outside	631.70	-0.22	0.87
06+90	top, inside	630.66	0.20	1.26
08+00	top, inside	625.94	-0.94	0.41
08+00	toe	613.18	-0.04	2.79
08+00	top, outside	627.22	-0.52	0.54
10+00	toe	607.21	0.05	0.65
10+00	top, outside	619.75	-0.10	0.50
10+00	top, inside	618.33	-0.88	0.99
12+00	toe	601.54	0.10	1.03

12+00	top, outside	613.66	-0.16	0.98
12+00	top, inside	612.09	-0.64	0.25
14+00	toe	593.01	-0.14	1.46
14+00	top, outside	607.05	-0.13	0.62
14+00	top, inside	605.62	-0.55	0.53
16+00	toe	584.09	-0.26	0.37
16+00	top, outside	597.17	0.28	0.38
16+00	top, inside	595.88	0.10	0.70
18+00	toe	575.21	-0.10	0.50
18+00	top, outside	587.09	-0.29	0.44
18+00	top, inside	585.68	0.05	0.20
20+00	top, outside	573.18	-0.23	0.87
20+00	toe	563.22	-5.76	0.58
20+00	top, inside	571.63	-2.06	0.29
22+00	top, outside	559.07	-1.06	0.76
22+00	toe	546.59	-11.18	0.68
22+00	top, inside	558.19	-2.96	0.54
23+75	top, inside	553.95	-0.28	0.44
24+00	toe	524.11	0.02	0.05
24+00	top, outside	554.68	5.72	1.22
24+00	MSE face	539.13	-0.05	2.79
26+00	toe	516.78	-0.10	0.53
26+00	top, outside	539.80	**	**
26+00	top, inside	537.45	**	**
27+50	toe	512.49	-0.17	0.99
27+50	top, outside	523.68	**	**
27+80	top, outside	511.51	**	**
		Maximum	**5.72**	**2.79**
		Minimum	**-11.18**	**0.05**
		Average	**-0.65**	**0.80**

** = *Control Point removed during FFVE Stage 2 construction.*

Table 2: FFVE Stage 1 Monitoring Point Displacement Summary Table
MOVEMENT DURING REPORTING PERIOD

STA	Location	Original Elevation	Elevation Change (in)	Magnitude of Plan View Movement (in)
06+02	toe	618.16	0.08	0.20
06+68	toe	615.44	-0.02	0.13
06+68	top, outside	631.70	-0.05	0.30

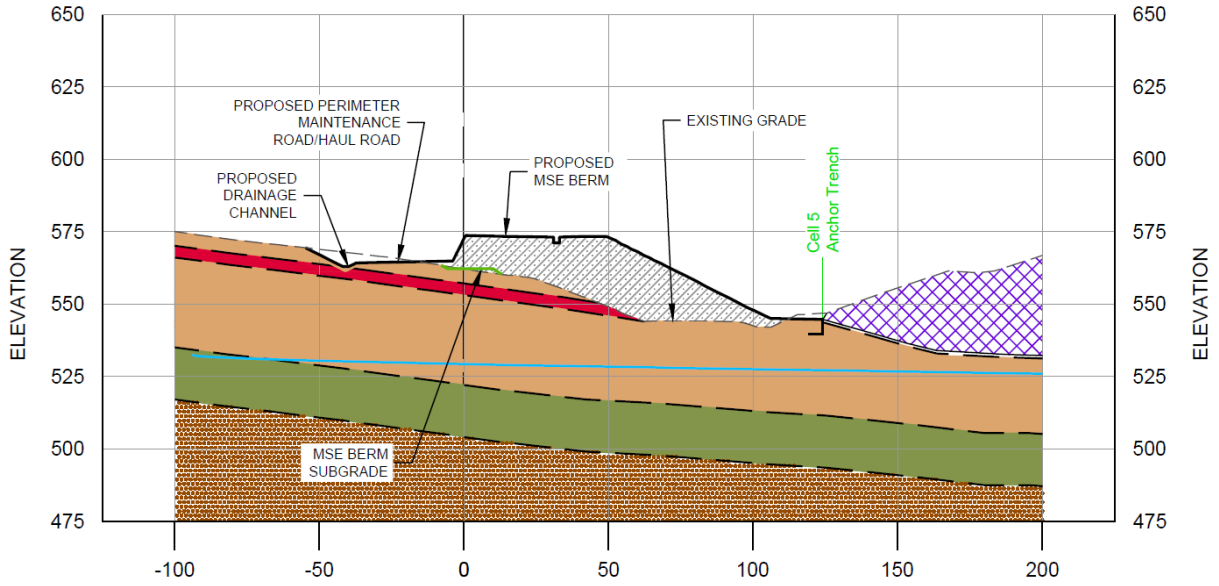
06+90	top, inside	630.66	-0.01	0.62
08+00	top, inside	625.94	-0.20	0.59
08+00	toe	613.18	-0.01	0.90
08+00	top, outside	627.22	-0.40	0.22
10+00	toe	607.21	0.17	0.24
10+00	top, outside	619.75	0.06	0.11
10+00	top, inside	618.33	-0.18	0.66
12+00	toe	601.54	0.14	0.08
12+00	top, outside	613.66	0.06	0.09
12+00	top, inside	612.09	0.18	0.64
14+00	toe	593.01	0.00	0.41
14+00	top, outside	607.05	0.04	0.35
14+00	top, inside	605.62	-0.16	0.65
16+00	toe	584.09	-0.14	0.60
16+00	top, outside	597.17	0.10	0.40
16+00	top, inside	595.88	-0.06	0.55
18+00	toe	575.21	-0.10	0.52
18+00	top, outside	587.09	-0.07	0.34
18+00	top, inside	585.68	0.14	0.40
20+00	top, outside	573.18	0.10	0.51
20+00	toe	563.22	-5.77	0.03
20+00	top, inside	571.63	-0.26	0.36
22+00	top, outside	559.07	-0.07	0.79
22+00	toe	546.59	-6.16	0.76
22+00	top, inside	558.19	-0.29	0.42
23+75	top, inside	553.95	-0.13	0.39
24+00	toe	524.11	-0.04	0.43
24+00	top, outside	554.68	6.02	0.38
24+00	MSE face	539.13	0.00	2.47
26+00	toe	516.78	-0.26	0.49
26+00	top, outside	539.80	**	**
26+00	top, inside	537.45	**	**
27+50	toe	512.49	-0.36	0.53
27+50	top, outside	523.68	**	**
27+80	top, outside	511.51	**	**
		Maximum	**6.02**	**2.47**
		Minimum	**-6.16**	**0.03**
		Average	**-0.23**	**0.49**

** = *Control Point removed during FFVE Stage 2 construction.*

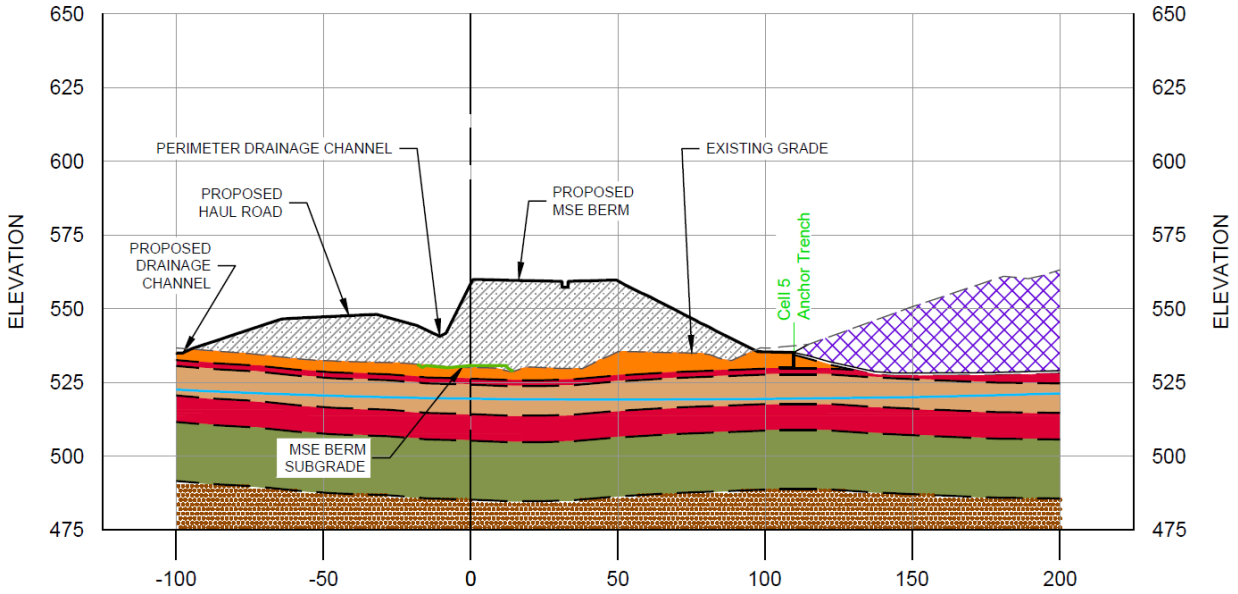
Additionally, the change in elevation observed at each monitoring point is generally minimal. The average change in elevation over the life of the monitoring points was 0.65 inches of settlement. During the reporting period, the average change in elevation was 0.23 inches of

settlement. To date, the observed changes in elevation are relatively minor and are not indicative of any type of instability. The total change in elevation at each monitoring point is provided in Table 1 and the elevation change during the reporting period is provided in Table 2.

It should be noted that the changes in elevation at STA 20+00 and 22+00 along the toe of the berm do show more significant settlement than the rest of the monitoring points. The settlement is likely due to the phasing and sequencing of construction. After the MSE berm was constructed, additional structural fill was placed along the face of the MSE berm in this area to construct the new landfill haul road. Therefore, the control monuments were installed within the additional structural fill, which is more prone to settlement than the MSE berm, especially at the interface of the MSE berm and structural fill, where compaction of the subsequently placed structural fill would be more difficult due to the presence of the MSE berm welded wire forms. Below are two cross-sections at STA 20+00 and 22+00 showing the bottom of the MSE berm and the structural fill placed along the outside of the MSE berm.



SECTION 21 (STA. 20+00.00)



SECTION 23 (STA. 22+00.00)

Additionally, STA 24+00, toe of berm shows an increase in elevation of 6.02 inches during the reporting period. Construction activities for the FFVE Stage 2 construction were on-going in this vicinity during the reporting period and may have inadvertently impacted the monitoring point in this area. This area will continue to be monitored, but there is no evidence of instability in this area.

CONCLUSIONS

After completing the annual inspection and reviewing the available monitoring point survey data on the FFVE Stage 1 MSE berm, ARM has not observed any current data or trends indicative of instability. The MSE berm appears to be in good condition and does not require any remedial or maintenance actions at this time.

ATTACHMENT A

MSE Berm Inspection Form

ARM Group LLC

Engineers and Scientists

P.O. Box 797, 1129 West Governor Road, Hershey, PA 17033-0797
Phone (717) 533-8600 Fax (717) 533-8605 www.armgroup.net

MSE Berm Inspection Form

Site Location: *Frey Farm Landfill* Inspector: *Benjamin S. Allen, P.E.*
Berm Segment: *FFVE Stage 1* Inspection Date: *12/16/2021*

Stormwater Management Evaluation

1. Is stormwater overtopping the face of the MSE berm?
   ☐ YES ☒ NO
   If YES, immediately notify the Engineer-of-Record.

2. Are all inlets and/or drains unclogged and functioning properly?
   ☒ YES ☐ NO
   If NO, immediately notify Maintenance for immediate corrective action.
   Please note which inlets and/or drains are not functioning properly:

   _____

   _____

   _____

3. Evaluate the condition of stormwater channels on top of the MSE berm.
   a) Is there damage to the channel lining?
      ☐ YES ☒ NO

   b) Can water enter into either the reinforced or unreinforced zone of the MSE berm?
      ☐ YES ☒ NO

   c) Is there deposition of material along the length of the channels or changes in the channel profile due to erosion, subsoil migration, and depositional features?
      ☐ YES ☒ NO

   d) Is there evidence of degraded or dysfunctional stormwater channels?
      ☐ YES ☒ NO
      If YES, immediately notify the Engineer-of-Record.

If any questions under Part 3 of this section were answered with YES, please describe the deficiencies and note the location of the deficiencies: *Not applicable.*

Erosion Assessment

1. Is there evidence of erosion on the exterior or interim (if applicable) face of the MSE berm?

   ☐ YES ☒ NO

   If YES, immediately notify the Engineer-of-Record.

   Please identify the areas where erosion appears to be occurring:

2. Is there excessive erosion at pipe or utility penetrations?

   ☐ YES ☒ NO

   If YES, notify the Engineer-of-Record.

   Please identify the areas where erosion appears to be occurring:

3. Is there evidence of soil migration and/or deposition at the toe or on the horizontal shelves of the MSE berm?

   ☐ YES ☒ NO

   If YES, notify the Engineer-of-Record.

   Please identify the areas of soil migration and/or deposition:

Vegetation Inspection

1. Is vegetation on the face of the MSE berm lacking after two (2) growing seasons?

   ☐ YES ☒ NO

   If YES, notify the Engineer-of-Record.

Locations/
Comments: *Vegetation along the northern portion of the berm is very good, with thick grass, limited weeds, and no woody vegetation. Eastern portion of the berm is acceptable, but the vegetation is not as thick and more weeds are present compared to the northern portion of the berm.*

2. Has any of the vegetation grown to a size that poses a threat to collapse under wind, ice, or snow loading or does any vegetation exhibit woody bark or complex root systems?

☐ YES ☒ NO

If YES, notify Maintenance for removal.

3. On portions of the MSE berm facing comprised of aggregate (if applicable):

Is the biaxial geogrid facing wrap intact and retaining the aggregate?

a) ☐ YES ☐ NO

If NO, please note the locations: *Not applicable.*

b) Are the geogrid apertures distorted or otherwise incompatible with the size of the retained aggregate?

☐ YES ☐ NO

If YES, please note the locations: *Not applicable.*

c) Are there sizeable void spaces behind the geogrid or signs of aggregate loss?

☐ YES ☐ NO

If YES, please note the locations: *Not applicable.*

If NO to question 3a or YES to questions 3b or 3c under Part 3 of this section, notify the Engineer-of-Record.

Tension Crack Evaluation

1. Is there any evidence of tension cracks along the top of the berm?

☐ YES ☒ NO

If YES, immediately notify the Engineer-of-Record.

2. Are there tension cracks within the paved access road on top of the MSE berm?

☐ YES ☒ NO

If YES, immediately notify the Engineer-of-Record.

Please note the location of any evidence of tension cracks:

Not applicable.

Toe Heaving Inspection

1. Is there any evidence of toe heaving?

☐ YES ☒ NO

If YES, immediately notify the Engineer-of-Record.

Please note the location of any evidence of toe heaving:

Not applicable.

Geogrid Assessment

1. To the extent possible, evaluate the condition of the biaxial geogrid at the face of the MSE berm.

The biaxial geogrid is intact and in good condition. Vegetation is providing adequate shading to prevent UV degradation of the biaxial geogrid.

2. Note the location of any severe degradation or extensive damage to the biaxial geogrid.

None.

Bulging/Sagging Evaluation

1. Is there evidence of excessive bulging or sagging (i.e., greater than 2 inches) at any point along the outer face of the MSE berm?

☐ YES ☒ NO

If YES, immediately notify the Engineer-of-Record.

Please note the location of any excessive bulging or sagging:

Not applicable.

Top Surface Penetration Inspection

1. Is there evidence of gaps opening around penetrations (e.g., guiderail posts, fence posts, etc.) or tilting or settlement of such features?

   ☐ YES ☒ NO

   If YES, notify the Engineer-of-Record.

   Please note the locations:

Road Surface Inspection

1. Is there any deterioration of the road surface at the top of the MSE berm (i.e., cracking, erosion, settlement, undulations, exposure of geogrid, etc.)?

   ☐ YES ☒ NO

   If YES, notify the Engineer-of-Record.

   Please note the locations:

Some very minor pavement damage on the earthen berm ramp at the beginning of the berm, likely due to equipment working in this area during waste placement. Minor aggregate washout between the road and channel near STA 21+00.

Guide Rail and Safety Fence Assessment

1. Are the guide rail and safety fence intact, undamaged, fully functional, and continuous throughout the originally installed length?

   ☒ YES ☐ NO

   If NO, notify Maintenance for repair.

   Please note the locations:

Note: Any obvious changes to the profile of the horizontal components of the fencing or guide railing shall be reported to the Engineer-of-Record.

Animal Damage and Vandalism

1. Is there evidence of animal damage such as burrowing or other forms of animal damage (e.g. rodent) holes within the MSE berm backfill or at the toe of the berm)?
   [ ] YES [X] NO

2. Is there any form of damage due to vandalism?
   [ ] YES [X] NO

Any damage should be reported to Maintenance and the Engineer-of-Record.

Additional Notes/Comments

Overall, the FFVE Stage 1 MSE berm is in good condition. No evidence of instability has been observed to date. The vegetation at the face of the berm is adequate and the biaxial geogrid is intact and properly shaded.

ARM did note that some pavement damage was observed at the beginning of the earthen berm ramp onto the start of the Stage 1 MSE berm. The very minor pavement damage was likely due to equipment working in this area during filling operations for FFVE Stage 1. The damage does not create any concerns, but was noted.

A small area of aggregate between the paved roadway and the concrete channel on top of the MSE berm, in the vicinity of STA 21+00, showed some evidence of a minor washout. This area should continue to be inspected and repaired if needed. This is viewed as a maintenance activity and does not have an impact on the performance of the MSE berm at this time.

ATTACHMENT B

Photo Log

PHOTO 1

PHOTO 2

PHOTO 3

PHOTO 4

PHOTO 5

PHOTO 6

PHOTO 7

PHOTO 8

PHOTO 9

PHOTO 10

PHOTO 11

PHOTO 12

PHOTO 13

PHOTO 14

PHOTO 15

PHOTO 16

PHOTO 17

PHOTO 18

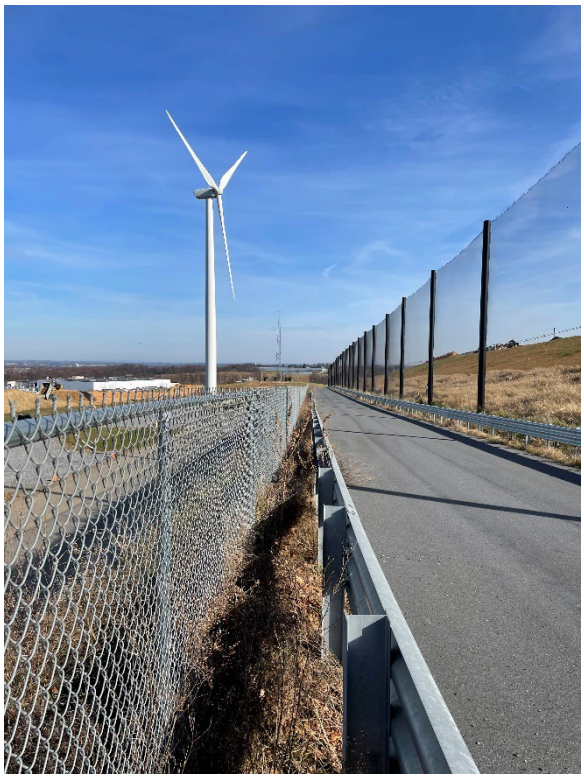


PHOTO 19

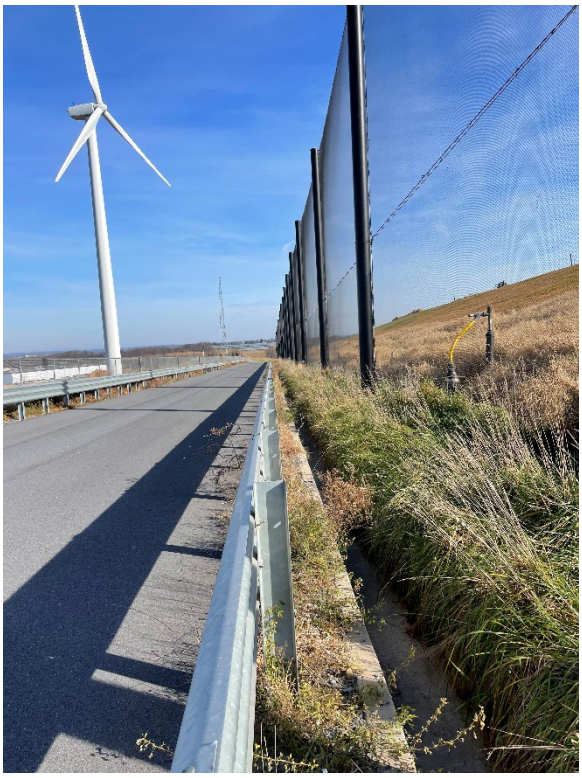


PHOTO 20

PHOTO 21

PHOTO 22

PHOTO 23

PHOTO 24

PHOTO 25

PHOTO 26

PHOTO 27

PHOTO 28

PHOTO 29

PHOTO 30

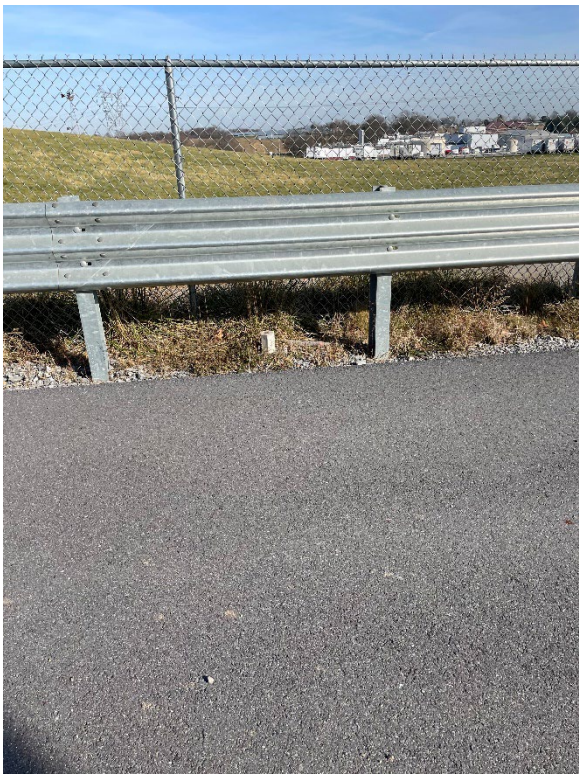


PHOTO 31

PHOTO 32

PHOTO 33

PHOTO 34

PHOTO 35

PHOTO 36

PHOTO 37

PHOTO 38

PHOTO 37

ATTACHMENT C

MSE Berm Control Points

NOTES:

1. EXISTING TOPOGRAPHY HAS BEEN CREATED FROM AN AERIAL SURVEY PROVIDED BY DAVID MILLER/ASSOCIATES, INC., FLIGHT DATED: 01/06/2022; SUPPLEMENTED OUTSIDE OF THE LIMITS OF THI SURVEY WITH AERIAL SURVEY PROVIDED BY LAND GRANT SURVEYORS DATED: 09/21/2021.

2. BASE MAP BEYOND LANDFILL PERIMETER ROADWAY PROVIDED BY LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY BASED ON TOPOGRAPHY FROM ADR EASTERN, DECEMBER 2008. LANDFILL FOOTPRINT TOPOGRAPHY WITHIN LANDFILL PERIMETER ROADWAY BOUNDARIES PROVIDED BY LANCASTER COUNTY SOLID WASTE MANAGEMENT AUTHORITY ON MARCH 1, 2017.

3. ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL DATUM. (NOTE: "MEAN SEA LEVEL DATUM" REFERS TO THE NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929). A SITE SPECIFIC COORDINATE SYSTEM IS USED FOR THE HORIZONTAL DATUM.

WIND TURBINE A

WIND TURBINE B

CELL TOWER

CELL 5

CELL 4

CELL 6

ARM Group LLC
Engineers and Scientists
www.armgroup.net

No.	Revision	Date	By

scale	1" = 70'
date	JUNE 2022
project no.	22010663
designed	ARM
checked	BSA
drawn	TMR
graphic scale	0 70 140 210 SCALE IN FEET

Sheet 1

drawing title: MSE BERM MONITORING POINTS 2021 ANNUAL MSE BERM REPORT

project title: VERTICAL EXPANSION FREY FARM LANDFILL

MANOR TOWNSHIP
LANCASTER COUNTY, PA

Attachment 7

Visual Landscape Synthesis Plan Annual Report

May 19, 2022

Frey Farm Landfill

Stage 1 Visual Landscape Synthesis Plan

Annual Status Update

Manor Township Lancaster County, Pennsylvania

Introduction

The Frey Farm Landfill (FFLF) is a Municipal Solid Waste (MSW) disposal facility operated by Lancaster County Solid Waste Management Authority (LCSWMA), located along River Road in Manor Township, Lancaster County, Pennsylvania.

Construction of the Frey Farm Landfill (FFLF) Visual Landscape Synthesis Plan (VLSP) Stage 1 began in 2019 and consisted of planting a combination of 158 native-species trees and shrubs, and natural succession seed mix over approximately 30.2 acres of final cap. Stage 1 was the only stage completed in 2019. Since that time an additional planting area has nearly been completed. Approximately 94% of the planned Stage 2 area has been completed.

Map exhibits have been included for reference.

The VLSP is designed to achieve the following core objectives:

1. Achieve an enhanced and more natural appearance that blends into the surrounding landscape, over time, of the Frey Farm Landfill (FFLF) from neighboring viewpoints by mitigating potential visual impacts associated with the FFVE and improving the long- term appearance of the FFLF when compared to the mowed vegetative cover that is traditionally used post-closure at landfills;

2. Achieve a sustainable vegetative ecosystem for the long-term success that also reduces the need for traditional maintenance activities to support vegetation (fertilization, lime application, mowing, etc.); and

3. Minimize interference from landscaping with ongoing landfilling operations, and promote the continued safe operation of the FFLF in compliance with PADEP regulations.

Summary of 2021 Implementation Activities

Initial implementation efforts began in the fall of 2019 and continued through 2020 and 2021. During the Fall of 2021 384 pieces of plant material were planted in "Stage 2" planting zone (an area covering approximately 11.8 acres) 94% of "Stage 2" planting area has been completed. There is a small portion of the

landfill, approximately 0.53 acres (within Stage 2) that was not complete with final slopes. This zone will be planted in the future as landfill sequencing is completed. An additional 26 pieces of plant material will be planted within this .53 acre zone.

2021 Maintenance

2021 efforts were mainly related to weed suppression around maturing plant material and the installation of more robust deer guard protection. In a few instances, once again, support stakes were set to protect immature plant material from wind stress. No fertilizers or irrigation efforts were used in 2021.

Monitoring

LCSWMA is continuing a bi-weekly monitoring of Stage 1 and Now Stage 2 (see attached monitoring reports). LCSWMA will continue its practice to conduct inspections of the plantings after significant weather events such as large storms where wind gusts above 50 mph may have occurred. Action items will be taken on an as needed basis following the discovery or observation of a potential issue. LCSWMA will continue onsite observations of the soil and plants along with past photographic records will continue to be used to monitor this aspect of the study.

There were a few trees that did receive insect damage, during 2021, likely from spider mites and possibly the spotted lanternfly. The honey locust population once again seemed to be the most susceptible to this condition. We will monitor repeat occurrences / susceptibility during the course of the 2021 growing season.

The population of plant material did not sustain the deer damage we had observed in the past. The addition of more robust deer guards around the base of select plant material has thwarted the "buck rub" damage we had observed in the past. We have still observed deer damage, however we believe we are on a better path with the more robust guards.

Weed growth has become more of a maintenance item as the mulch layer begins to break down into a soil blanket. This condition is normal and was expected to occur. Weed growth will be monitored and where needed cut back or "weed whacked" to thwart excessive competition with the tree and shrub population.

Proposed Modifications or Revisions to the Plan

Currently there are no plans to modify any portion of the plan. Overall the first stage is meeting performance expectations. Some plant material in Stage 1 was replaced in the Fall of 2021. Mainly this was plant material that had sustained mortal deer damage back in 2019 and had not thrived. This damage had mainly occurred before the more robust deer guards were used.

Approximately 94% of Stage 2 was planted in the Fall of 2021. There are no plans to modify or revise any section Stage 2.

The natural succession area continues to perform well and continues to "soften" the engineered appearance of the landfill (benching). The visual softening and textural diversity observed in 2020 seems to be increasing over time. The result is a more natural appearance to the landfill slopes that blends into the surrounding landscape. No additional modifications or revisions are planned for this zone.

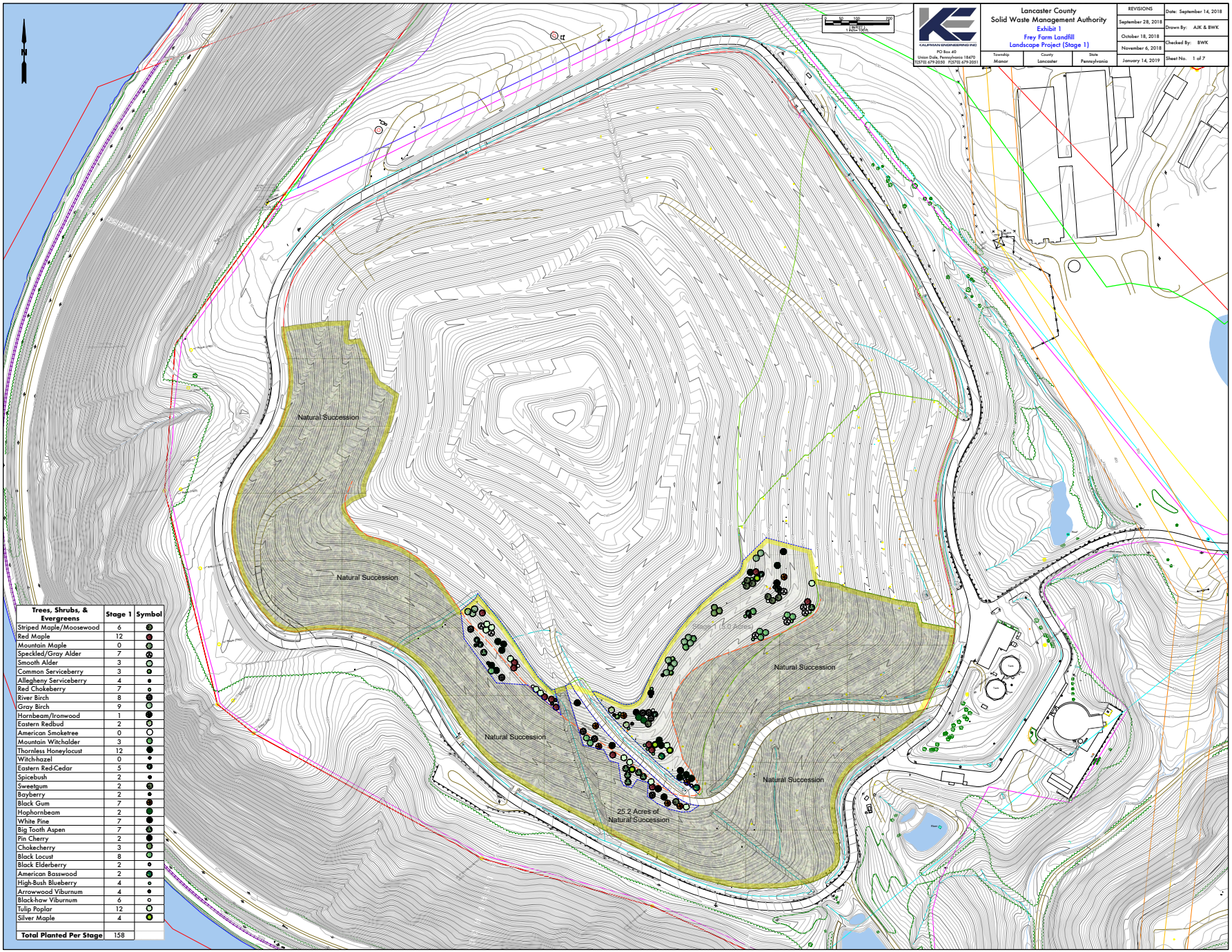
Planned 2021 Activities

Monitoring will be performed bi-weekly by (FFLF) staff and seasonally by Kaufman Engineering, Inc. or as needed.

2021 will likely not have any additional tree or shrub planting. Additional portions of the landfill will need to be completed before additional tree and shrub implementation can occur.

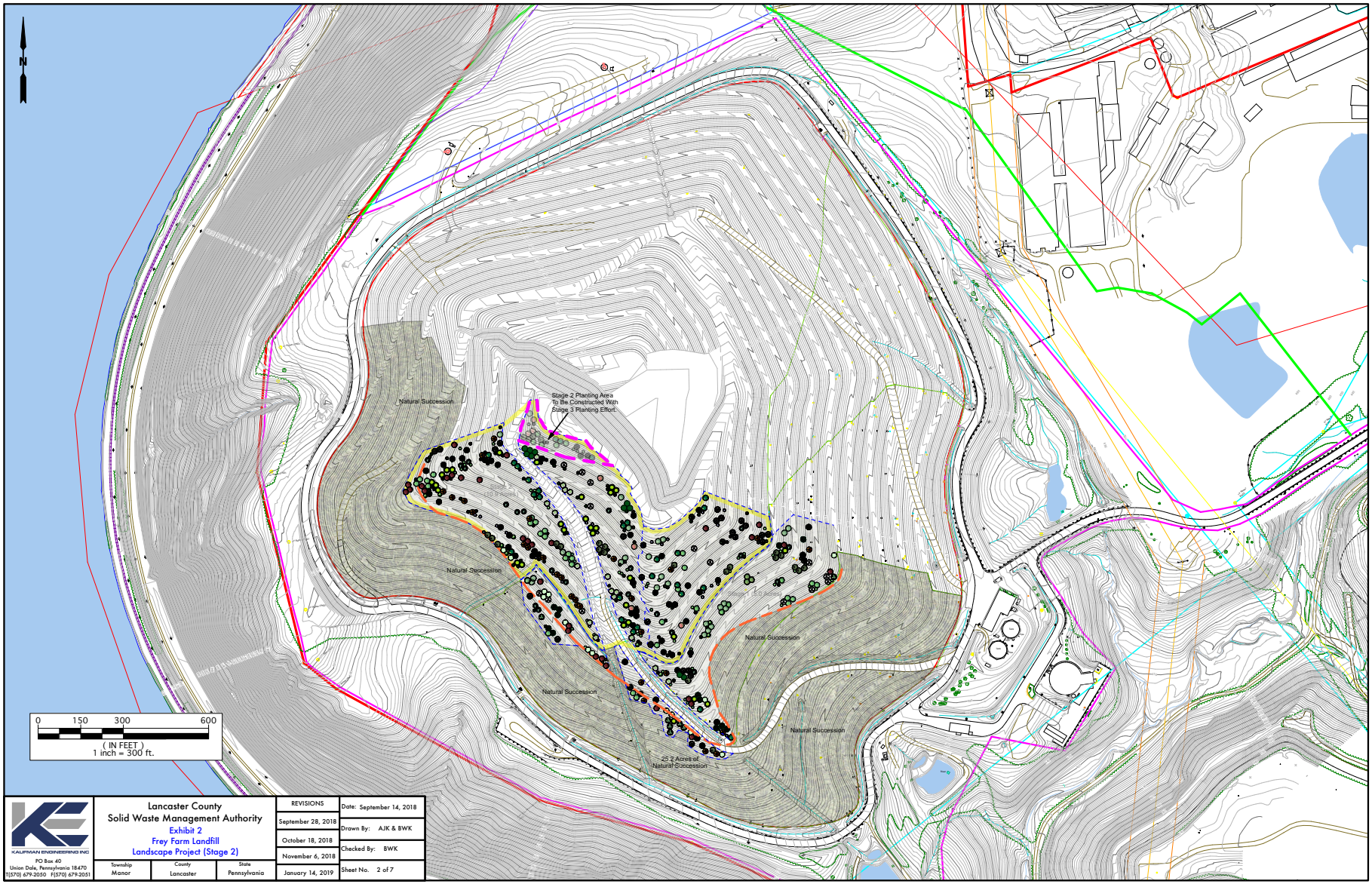
Other Meetings / Notes:
A Spring Inspection and walk through was completed on 5/11/2021 by Kaufman Engineering, Inc.
Attendees:
Michelle Marsh, LCSWMA
Jeff Musser, LCSWMA
Ashley Gichuki, LCSWMA
Ted Evgeniadis, Lower Susquehanna Riverkeeper Association
Mary Glazier
Brian Kaufman of Kaufman Engineering, Inc.

A Fall inspection and walk through was completed on 11/1/2021 by Kaufman Engineering, Inc.
Attendees:
Michelle Marsh, LCSWMA
Jeff Musser, LCSWMA
Ashley Gichuki, LCSWMA
Ted Evgeniadis, Lower Susquehanna Riverkeeper Association
Brian Kaufman of Kaufman Engineering, Inc.

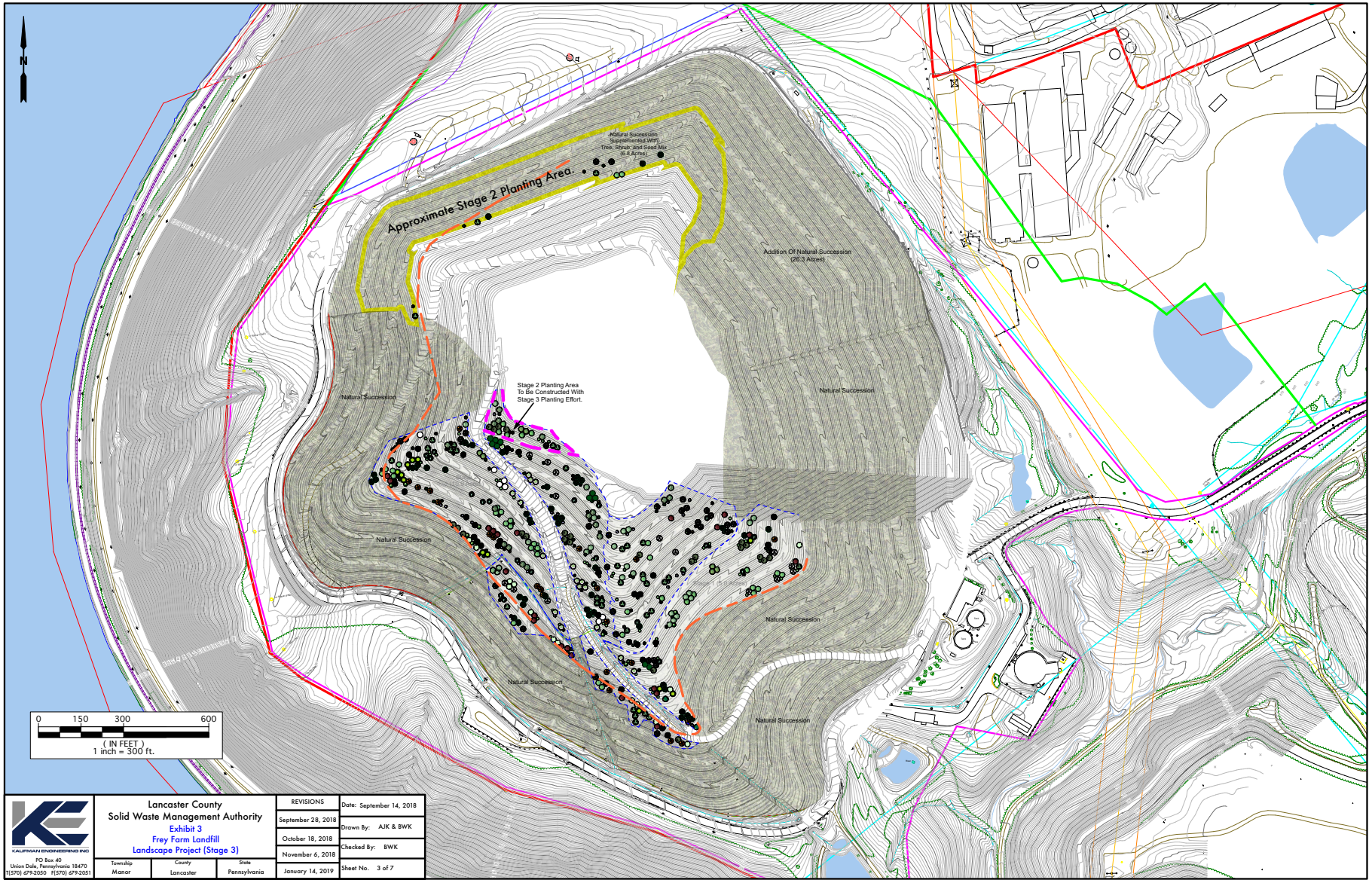


Trees, Shrubs, & Evergreens	Stage 1	Symbol
Striped Maple/Moosewood	6	
Red Maple	12	
Mountain Maple	0	
Speckled/Gray Alder	7	
Smooth Alder	3	
Common Serviceberry	3	
Allegheny Serviceberry	4	
Red Chokeberry	7	
River Birch	8	
Gray Birch	9	
Hornbeam/Ironwood	1	
Eastern Redbud	2	
American Smoketree	0	
Mountain Witchalder	3	
Thornless Honeylocust	12	
Witch-hazel	0	
Eastern Red-Cedar	5	
Spicebush	2	
Sweetgum	2	
Bayberry	2	
Black Gum	7	
Hophornbeam	2	
White Pine	7	
Big Tooth Aspen	7	
Pin Cherry	2	
Chokecherry	3	
Black Locust	8	
Black Elderberry	2	
American Basswood	2	
High-Bush Blueberry	4	
Arrowwood Viburnum	4	
Black-haw Viburnum	6	
Tulip Poplar	12	
Silver Maple	4	
Total Planted Per Stage	158	

Stage One Overview Map



Overview Map of Stage Two Planting Completed in 2021 (Inside Yellow). Remaining Stage Two Planting is Highlighted (In Pink)



Stage Three (Planned) Overview Map - For Future Reference

Inspection Reports

May 11, 2021
(By: Kaufman Engineering, Inc.)

Novembe1 1, 2021
(By: Kaufman Engineering, Inc.)

Multiple Inspection Reports
(By: Site Management)

Frey Farm Landfill -Visual Landscape Synthesis Plan Bi-Weekly/Post Weather Event Inspection Stage 1

Date: 5/11/21

Name of Inspector: Brian W. Kaufman - Kaufman Engineering, Inc.

Weather Conditions: Sunny 66°

Water

		Yes	No	Comments
1	Are there any test plots with areas of saturation or pockets of water.		*	Slopes moisture appeared even and uniform
2	Are there any test plots with erosion damage (including toe of test plots).		*	
3	Do benches have sedimentation or unusual conditions?		*	
4	Is there water flowing onto bench that is unusual or a potential issue?		*	
5	Does there appear to be any slumping of the test plots?		*	
6	Are there any areas that are overly dry and in need of water?		*	Ideal Spring Conditions
7	Other - Explain		*	

Animals

		Yes	No	Comments
1	Is there damage to plant material from animals (deer, birds, etc.)?	*		Deer (buck rubs mainly from 2020 rut)
2	Is there damage to mulch beds from animals?		*	Minor groundhog digging around plant #140
3	Are there nests of bees or other insects which could be harmful to humans / other animals?		*	
4	Are there any holes or burrows in mulch beds and soil from burrowing animals?		*	Minor groundhog digging around plant #140
5	Other - Explain			Multiple Bird boxes added - new wildlife habitat (boxes are in use)

Vegetation

		Yes	No	Comments
1	Is there damage to plant material?	*		Deer browse and buck rubs noted.
2	Is there insect damage to plant material?	*	*	Potential, minor spider mite damage to plant #31
3	Is there animal damage to plant material?		*	Yes, deer browse and buck rub damage observed.
4	Is there storm damage to plant material?		*	Several river birch have had wind stress. All root balls appear to be in good position.
5	Is there wind blow to plant material?		*	Root balls are all secure and properly placed. Some plants leaning (curved) due to prevailing wind pressures - continue monitor for potential staking
6	Is there noticeable fatigue to any plant material?	*		Honey Locust population is noticeably week. Buck rubs are visible on many trees. Additional buck rub protection is planned before the 2021 rut / season per Jeff Musser of LCSWMA.
7	Is there damage to plant material from landscape crew?		*	N/A at this time
8	Is there damage to plant material from other workers (LF staff or Contractors)?		*	
9	Any plant material missing "identification stakes"?		*	Stakes are holding up. A few were reset during this inspection. Recommended painting tops for easier visability on future inspections and marking numbers that have faded in sun.
10	Other - Explain		*	Weed growth is aggressive around the base of many trees and shrubs. Recommend weed controll around base of plants to allow plants to thrive. Care should be given to not damage bark around base of any plant material during weeding.

Photos

		Yes	No	Comments
1	Did you take photos today?	*		The majority of plants have been photographed. Natural sucession and contex photos taken as well.

Additional Notes or Comments:

Third inspection and walk through was completed with Jeff Musser, Michelle Marsh and Ashley Gichuki of LCSWMA. In addition, Ted Evgeniadis and Mary Glazier joined this inspection. Most plant material continues to do well. It is my belief that most plants continue to spend energy establishing to the site. Subsurface root development and establishment to the windy site are likely nearing completion. Expecting to see additional vertical growth in near future.

Deer (buck) damage was once again observed on many trees. More robust deer guards are planned for 2021. It is LCSWMA's goal to add additional guards or wraps during or prior to Stage 2 planting effort (currently being planned for this fall). It will be likely be difficult to mitigate all deer damage. Most decidious planting that have experienced heavy deer damage are still growing from suckers. In this case most plant material will survive and mature in a shrub form.

Natural succession zone ranges 18" - 40" in height (will be > by fall) . Slopes appear full with grasses thriving. Visual softening of benching and greater visual appeal continue to be extremely successful when contrasted with traditional mowed slope aesthetic. Some natural succession of locust, cherry and multiflora rose was observed in natural secession area. I believe we will continue to see the "natural sucession" area do well. Continued, seasonal, visual interest and texture, matching surrounding "buffer" landscapes will continue.

Other notes: Several birds were observed in trees (mainly blue birds and hawks). Several vultures were also sunning along road passing through Stage One planting area.

Recommend replacing plants #48, 62, 77-86, 88, 90, 106 (A separate list and recommended replacements will be prepared and likely installed prior to or concurrent with Stage 2 planting efforts).

Replacement plant material that was replanted in the fall of 2020 appears to be doing well with a few exceptions (Mainly deer damage / scarring).

Frey Farm Landfill -Visual Landscape Synthesis Plan Bi-Weekly/Post Weather Event Inspection Re Stage 1 and Stage 2

Date: 11/1/21

Name of Inspector: Brian W. Kaufman - Kaufman Engineering, Inc.

Weather Conditions: Sunny, windy 58°

Water

		Yes	No	Comments
1	Are there any test plots with areas of saturation or pockets of water.		*	Slopes moisture appeared even and uniform
2	Are there any test plots with erosion damage (including toe of test plots).		*	
3	Do benches have sedimentation or unusual conditions?		*	
4	Is there water flowing onto bench that is unusual or a potential issue?		*	
5	Does there appear to be any slumping of the test plots?		*	
6	Are there any areas that are overly dry and in need of water?		*	
7	Other - Explain		*	

Animals

		Yes	No	Comments
1	Is there damage to plant material from animals (deer, birds, etc.)?	*		Deer (buck rubs mainly from 2020 rut). New 4' guards were installed concurrently (same day) as new Stage 2 plant material was installed. In addition, where applicable, guards were reset on trees in Stage 1
2	Is there damage to mulch beds from animals?		*	
3	Are there nests of bees or other insects which could be harmful to humans / other animals?		*	No, however several spotted lanternflies were seen during the inspection. This could be an action item in the future. However, the population is now widespread in the region. Primary damage has been to fruit trees and vineyards.
4	Are there any holes or burrows in mulch beds and soil from burrowing animals?		*	
5	Other - Explain			Multiple Bird boxes added - new wildlife habitat (boxes are in use), Jeff Musser of LCSWMA has recently added a game camera to track wildlife onsite.

Vegetation

		Yes	No	Comments
1	Is there damage to plant material?	*		Deer browse and buck rubs noted from 2020 rut, no damage to Stage 2 plantings that were installed in October 2021.
2	Is there insect damage to plant material?	*	*	Several spotted lanternflies observeed. Also likely spider mite damage on remaining honey locust in Stage 1 area.
3	Is there animal damage to plant material?		*	Prior years buck rub damage observed. Also deer have damaged plants in natural sucession in Stage 1. Main damage to American Pokeweed bushes that have started to grow within portions of the site. No action needed as these have grown on their own and are quite resiliant.
4	Is there storm damage to plant material?		*	Several river birch have had wind stress. All root balls appear to be in good position (Stage 1 comment only).
5	Is there wind blow to plant material?		*	Root balls are all secure and properly placed. Some plants leaning within Stage 1(curved) due to prevailing wind pressures - continue monitor for potential staking.
6	Is there noticeable fatigue to any plant material?	*		Honey Locust population is noticeably week within Stage 1. Buck rubs are visible on many trees. Additional buck rub protection is planned before the 2021 rut / season per Jeff Musser of LCSWMA.
7	Is there damage to plant material from landscape crew?		*	N/A at this time for Stage 1. Stage 2 planting has just recently been completed and site clean-up post implementation looks good.
8	Is there damage to plant material from other workers (LF staff or Contractors)?		*	
9	Any plant material missing "identification stakes"?		*	Stakes are holding up. A few were reset during this inspection. Recommended painting tops for easier visability on future inspections and marking numbers that have faded in sun. Tempoary Stage 2 markers are present. Longer term markers are in progress.
10	Other - Explain		*	Weed growth is aggressive around the base of many trees and shrubs. Recommend weed controll around base of plants withing Stage 1 to allow plants to thrive. Care should be given to not damage bark around base of any plant material during weeding. Stage 2 - This is NA at the moment but will moniter in 2022.

Photos

		Yes	No	Comments
1	Did you take photos today?	*		Select photos attached - Additional photos taken exist in computer files.

Additional Notes or Comments:

Fourth inspection and walk through was completed with Jeff Musser, Michelle Marsh and Ashley Gichuki of LCSWMA. In addition, Ted Evgeniadis joined this inspection. Most plant material continues to do well. It is my belief that most plants continue to spend energy establishing to the site. Subsurface root development and establishment to the windy site are likely nearing completion. Starting to see additional vertical growth in Stage 1 plantings.

Deer (buck) damage was once again observed on many trees. Larger deer guards were added to try and create additional protection. Deer guards were added to all Stage 2 plants concurrent with the October implementation. Still it will be likely be difficult to mitigate all deer damage. Jeff Musser is attempting to catch the deer (buck) population on a game camera that has been placed onsite.

Natural succession zone ranges 18" - 72" in height. Slopes appear full with grasses thriving. Visual softening of benching and greater visual appeal continue to be extremely successful when contrasted with traditional mowed slope aesthetic. Some natural succession of locust, cherry and multiflora rose, american pokeweed was observed in natural secession area. I believe we will continue to see the "natural sucession" area do well. Continued, seasonal, visual interest and texture, matching surrounding "buffer" landscapes will continue.

Other notes: Several birds were observed in trees (a bald eagle, blue birds, hawks and other song birds). Several vultures were also once again sunning along road passing through Stage One planting area.

Not recommending replacing plants within Stage 1 planting. (Note: concurrent with Stage 2 planting, 26 plants were replaced within Stage 1 - These were additional plants that were not scheduled to be planted within Stage 2 at this point of the landfill sequencing / construction. The decision was made (during Stage 2 planting in October 2021) to place the 26 plants within the Stage 1 planting area where needed (thus enhancing Stage 1 plantings).

Replacement plant material that was replanted in the fall of 2020 appears to be doing well with a few exceptions (Once again mainly deer damage / scarring).

Stage One

Photos Taken During
November 2021 Inspection

Stage Two

Photos Taken During November 2021 Inspection Initial Staking, Staging and Implementation

During the Fall of 2021
384 Trees and Shrubs were
planted in Stage 2 and
26 within Stage 1.

Natural Succession

Stage 2 Planting Area
To Be Constructed With
Stage 3 Planting Effort.

Stage 2
(10.9 Acres)

Natural Succession

Stage 1 (5.0 Acres)

Natural Succession

Witch-hazel	Red Maple	Tulip poplar	Chokecherry
Eastern Red Cedar	Speckled/Gray Alder	Silver Maple	Black Locust
Spicebush	Smooth Alder	Buckeye	Black Elderberry
Sweetgum	Common Serviceberry	High Bush Blueberry	Pin Oak
Bayberry	Allegheny Serviceberry	Arrowwood viburnum	Eastern Redbud
Black Gum	Red Chokeberry	Black Haw Viburnum	Mountain Witchalder
	River Birch	American Hornbeam	Black Cherry
	Gray Birch	Eastern White Pine	Hophornbeam

N

0 50 100 200
(IN FEET)
1 inch = 100 ft.

Approximate Stage 2
Project Area Implemented
Fall 2021

KAUFMAN ENGINEERING INC
PO Box 40
Union Dale, Pennsylvania 18470
T(570) 679-2050 F(570) 679-2051

Lancaster County
Solid Waste Management Authority
Exhibit 1
Frey Farm Landfill
Landscape Project (Stage 2)

Township	County	State
Manor	Lancaster	Pennsylvania

REVISIONS
December 2021

Date: July 17, 2020
Drawn By: AJK & BWK
Checked By: BWK
Sheet No. 1 of 1

Natural Succession

Stage 2 Planting Area
To Be Constructed With
Stage 3 Planting Effort.

Stage 2
(10.9 Acres)

Natural Succession

N

0 50 100 200
(IN FEET)
1 inch = 100 ft.

Approximate Stage 2
Project Area Implemented
Fall 2021

KAUFMAN ENGINEERING INC
PO Box 40
Union Dale, Pennsylvania 18470
T(570) 679-2050 F(570) 679-2051

Lancaster County
Solid Waste Management Authority
Exhibit 2
Frey Farm Landfill
Landscape Project (Stage 2)

Township	County	State
Manor	Lancaster	Pennsylvania

REVISIONS
December 2021

Date: July 17, 2020
Drawn By: AJK & BWK
Checked By: BWK
Sheet No. 1 of 1

Stage 2 Plantings Fall 2021

Number	Plants	Size	Northing	Easting
1	Red Maple	.75 - 6′	229273.0	2330843.0
2	Pin Oak		229281.3	2330857.3
3	Red Maple	.75 - 6′	229298.2	2330851.8
4	Black Locust		229301.9	2330880.4
5	Black Locust		229317.2	2330892.8
6	Bayberry		229316.2	2330877.8
7	Red Maple	.75 - 6′	229293.5	2330899.2
8	Red Maple	1.5 - 10′	229276.9	2330909.0
9	Common Serviceberry		229259.9	2330911.0
10	Black Cherry		229266.2	2330925.5
11	Bayberry		229279.0	2330925.6
12	Black Locust		229293.2	2330921.0
13	Black Locust		229312.2	2330917.8
14	Silver Maple		229307.0	2330934.0
15	Bayberry		229290.6	2330933.6
16	Silver Maple		229296.6	2330948.2
17	Bayberry		229282.2	2330942.0
18	Silver Maple		229279.3	2330955.5
19	Common Serviceberry		229264.9	2330962.5
20	Black Gum	6′	229274.5	2330973.8
21	Black Cherry		229238.2	2330959.1
22	Black Gum	6′	229254.0	2331005.3
23	Bayberry		229249.2	2331035.0
24	Black Gum	6′	229241.5	2331048.3
25	Bayberry		229203.8	2331061.6
26	Black Gum	6′	229202.0	2331076.8
27	Bayberry		229206.2	2331089.4
28	American Black Elderberry		229192.0	2331086.1
29	American Black Elderberry		229186.5	2331104.1
30	Eastern White Pine	4′	229347.3	2330913.8
31	Black Locust		229333.7	2330940.0
32	Eastern Red Cedar		229384.4	2330920.2
33	Bayberry		229395.0	2330926.9
34	Bayberry		229405.5	2330933.0
35	River Birch	6′	229415.9	2330944.6
36	River Birch	6′	229422.2	2330962.6
37	Arrowwood Viburnum		229391.0	2330987.5
38	Black Cherry		229388.4	2331006.1
39	Black Cherry		229368.0	2330975.0
40	Silver Maple		229333.0	2330969.5
41	Silver Maple		229349.6	2330986.5
42	Silver Maple		229351.0	2331005.9
43	Allegheny Serviceberry		229318.9	2330973.1
44	Red Maple	.75 - 6′	229322.5	2330987.1
45	Allegheny Serviceberry		229318.9	2331001.1
46	Red Maple	.75 - 6′	229332.3	2331005.0
47	Black-haw Viburnum		229341.1	2331016.0
48	Red Maple	1.5 - 10′	229322.8	2331037.0
49	Red Maple	1.5 - 10′	229315.3	2331101.9
50	Pin Oak		229438.0	2331013.2
51	Black-haw Viburnum		229425.5	2331033.3
52	Spicebush		229442.0	2331069.5
53	Eastern White Pine	4′	229419.4	2331056.2
54	Eastern White Pine	4′	229390.7	2331040.8
55	Black-haw Viburnum		229377.6	2331046.5
56	Eastern Red Cedar		229377.5	2331063.6
57	Black-haw Viburnum		229368.1	2331070.5
58	Black-haw Viburnum		229368.3	2331049.4
59	Eastern Red Cedar		229354.8	2331051.0
60	Eastern Red Cedar		229364.8	2331036.0
61	Black-haw Viburnum		229352.6	2331037.5
62	Black Gum	6′	229401.8	2331110.0
63	Allegheny Serviceberry		229410.5	2331121.1
64	Pin Oak		229402.5	2331132.8
65	Allegheny Serviceberry		229387.5	2331106.6
66	Eastern White Pine	4′	229384.8	2331120.8
67	Allegheny Serviceberry		229372.0	2331130.6
68	Eastern White Pine	4′	229382.4	2331141.5
69	Black Cherry		229368.0	2331165.0

Stage 2 Plantings Fall 2021

Number	Plants	Size	Northing	Easting
70	Arrowwood Viburnum		229499.0	2331174.0
71	Gray Birch		229474.0	2331173.0
72	Black Gum	10′	229459.5	2331152.1
73	Red Chokeberry		229441.7	2331150.1
74	River Birch	10′	229443.6	2331173.1
75	River Birch	10′	229421.9	2331155.9
76	Allegheny Serviceberry		229408.5	2331158.1
77	Silver Maple		229410.3	2331171.5
78	Allegheny Serviceberry		229400.5	2331183.1
79	Red Maple	1.5 - 10′	229401.8	2331197.0
80	Pin Oak		229374.5	2331222.7
81	Pin Oak		229363.2	2331234.6
82	Bayberry		229350.7	2331243.4
83	Bayberry		229319.1	2331255.8
84	Pin Oak		229315.0	2331273.2
85	Red Chokeberry		229279.0	2331281.4
86	Red Chokeberry		229278.2	2331294.4
87	Pin Oak		229277.0	2331308.7
88	Pin Oak		229264.0	2331291.9
89	Pin Oak		229255.5	2331311.7
90	Red Chokeberry		229250.0	2331297.0
91	Eastern Redbud		229232.5	2331337.5
92	Red Chokeberry		229218.4	2331342.8
93	Eastern Redbud		229199.7	2331365.4
94	Bayberry		229187.1	2331370.4
95	Silver Maple		229160.3	2331386.5
96	Silver Maple		229139.8	2331397.6
97	Bayberry		229126.0	2331399.4
98	Bayberry		229129.0	2331408.2
99	Eastern Red Cedar		229228.3	2331194.8
100	Eastern Red Cedar		229201.7	2331233.7
101	Eastern Red Cedar		229203.5	2331257.0
102	Black Gum	10′	229179.2	2331276.2
103	Black Locust		229182.5	2331284.5
104	Black Locust		229163.9	2331279.8
105	Witch Hazel		229154.6	2331290.4
106	Black Locust		229167.2	2331298.4
107	Black Locust		229136.7	2331330.9
108	Black Locust		229126.7	2331314.9
109	Black Locust		229116.7	2331330.9
110	Witch Hazel		229127.2	2331340.0
111	Red Maple	.75 - 6′	229094.1	2331354.0
112	Sweetgum		229091.6	2331371.2
113	Spicebush		229078.8	2331373.4
114	Sweetgum		229081.6	2331386.2
115	Smooth Alder		229061.4	2331393.1
116	Black Locust		229041.2	2331402.9
117	Black Locust		229055.2	2331413.4
118	High-Bush Blueberry		229054.4	2331426.0
119	Black Locust		229040.2	2331425.9
120	High-Bush Blueberry		229030.2	2331435.3
121	Eastern Redbud		229013.3	2331443.7
122	Black Locust		229019.2	2331424.9
123	High-Bush Blueberry		229031.2	2331416.5
124	Spicebush		228753.3	2331516.5
125	Eastern Redbud		228762.7	2331508.4
126	Red Chokeberry		228772.0	2331502.8
127	American Black Elderberry		228803.1	2331487.1
128	Eastern Redbud		228815.2	2331486.9
129	Red Chokeberry		228822.2	2331478.3
130	Speckled/Gray Alder		228855.7	2331461.0
131	Black Gum	10′	228872.4	2331452.8
132	Black Gum	10′	228876.4	2331443.9
133	Black Gum	10′	228895.5	2331437.3
134	Black Gum	10′	228907.0	2331423.8
135	Eastern Red Cedar		228956.3	2331404.5
136	American Black Elderberry		228958.3	2331390.9
137	Black Gum	10′	228973.0	2331388.5
138	Black Gum	10′	228983.5	2331373.0

Stage 2 Plantings Fall 2021

Number	Plants	Size	Northing	Easting	
139	American Black Elderberry		228986.4	2331360.2	
140	Eastern Red Cedar		228996.8	2331355.0	
141	Witch Hazel		229028.7	2331328.3	
142	Black Gum	10′	229042.3	2331324.5	
143	Witch Hazel		229036.7	2331309.3	
144	Eastern Red Cedar		229053.8	2331308.0	
145	American Black Elderberry		229042.8	2331298.6	
146	Eastern White Pine	4′	229048.8	2331287.2	
147	Eastern White Pine	6′	229065.2	2331294.0	
148	Black Gum	10′	229078.2	2331271.3	
149	Red Maple	.75 - 6′	229088.1	2331285.0	
150	Black Gum	6′	229088.7	2331257.3	
151	Red Maple	.75 - 6′	229100.1	2331270.5	
152	Red Maple	.75 - 6′	229110.1	2331254.0	
153	Common Serviceberry		229115.4	2331220.5	
154	Eastern White Pine	4′	229121.2	2331206.0	
155	American Black Elderberry		229130.5	2331196.0	
156	Black Cherry		229149.0	2331175.5	
157	American Black Elderberry		229154.5	2331162.0	
158	American Black Elderberry		229132.5	2331116.5	
159	Sweetgum		229122.6	2331130.3	
160	Sweetgum		229110.6	2331145.2	
161	Sweetgum		229089.6	2331164.7	
162	Common Serviceberry		229085.4	2331178.5	
163	Tulip Poplar	6 - 7′	229068.8	2331185.4	
164	Eastern White Pine	4′	229079.0	2331202.3	
165	Common Serviceberry		229057.9	2331196.0	
166	Pin Oak		229063.6	2331213.0	
167	Tulip Poplar	8 - 9′	229042.2	2331210.8	
168	Eastern White Pine	4′	229049.0	2331226.4	
169	Bayberry		229016.8	2331219.8	
170	Silver Maple		229024.8	2331233.2	
171	Bayberry		229032.3	2331245.8	
172	Bayberry		229011.8	2331236.8	
173	Silver Maple		229017.9	2331249.7	
174	Gray Birch		229547.4	2331277.2	Will Be Planted In Stage 3
175	American Black Elderberry		229510.0	2331274.0	Will Be Planted In Stage 3
176	Buckeye		229526.0	2331291.5	Will Be Planted In Stage 3
177	Arrowwood Viburnum		229510.9	2331291.8	Will Be Planted In Stage 3
178	Buckeye		229487.4	2331288.6	Will Be Planted In Stage 3
179	Buckeye		229477.1	2331272.9	Will Be Planted In Stage 3
180	Red Maple	1.5 - 10′	229464.8	2331256.0	Will Be Planted In Stage 3
181	Red Maple	1.5 - 10′	229456.5	2331273.8	Will Be Planted In Stage 3
182	Red Maple	1.5 - 10′	229466.5	2331288.8	Will Be Planted In Stage 3
183	Mountain Witchalder		229476.3	2331304.8	Will Be Planted In Stage 3
184	Mountain Witchalder		229449.1	2331289.6	Will Be Planted In Stage 3
185	Red Maple	1.5 - 10′	229456.0	2331316.3	Will Be Planted In Stage 3
186	Mountain Witchalder		229437.9	2331318.6	Will Be Planted In Stage 3
187	Spicebush		229447.3	2331328.5	Will Be Planted In Stage 3
188	Spicebush		229445.8	2331338.0	Will Be Planted In Stage 3
189	Hophornbeam		229425.2	2331259.5	
190	Hophornbeam		229419.5	2331277.4	
191	Hophornbeam		229406.2	2331266.5	
192	Hophornbeam		229398.7	2331283.0	
193	Hophornbeam		229412.4	2331295.2	
194	Eastern Redbud		229395.2	2331301.4	
195	Silver Maple		229376.8	2331302.0	
196	Spicebush		229374.3	2331316.5	
197	Eastern White Pine	6′	229389.4	2331320.2	
198	Spicebush		229384.8	2331335.5	
199	Eastern White Pine	6′	229377.7	2331359.5	
200	Bayberry		229364.3	2331363.5	
201	Speckled/Gray Alder		229367.0	2331397.5	
202	Bayberry		229354.3	2331400.0	
203	Bayberry		229339.6	2331446.5	
204	Speckled/Gray Alder		229342.0	2331461.5	
205	Pin Oak		229458.3	2331368.0	Will Be Planted In Stage 3
206	Mountain Witchalder		229437.2	2331370.3	Will Be Planted In Stage 3
207	Pin Oak		229450.8	2331385.0	Will Be Planted In Stage 3

Stage 2 Plantings Fall 2021

Number	Plants	Size	Northing	Easting	
208	Mountain Witchalder		229443.9	2331404.1	Will Be Planted In Stage 3
209	Black Cherry		229430.8	2331442.0	Will Be Planted In Stage 3
210	Black-haw Viburnum		229422.6	2331430.0	Will Be Planted In Stage 3
211	Black-haw Viburnum		229416.1	2331444.0	Will Be Planted In Stage 3
212	Black-haw Viburnum		229414.1	2331465.5	Will Be Planted In Stage 3
213	River Birch	6′	229399.9	2331455.9	Will Be Planted In Stage 3
214	Eastern White Pine	4′	229400.0	2331480.0	Will Be Planted In Stage 3
215	Pin Oak		229393.2	2331494.8	Will Be Planted In Stage 3
216	Buckeye		229321.0	2331525.0	
217	Speckled/Gray Alder		229306.0	2331490.5	
218	Bayberry		229302.8	2331379.0	
219	Eastern Redbud		229296.2	2331394.0	
220	Eastern Redbud		229280.2	2331400.5	
221	Eastern Redbud		229272.7	2331418.6	
222	Bayberry		229253.8	2331444.6	
223	Silver Maple		229255.3	2331459.0	
224	Bayberry		229223.3	2331474.6	
225	Speckled/Gray Alder		229223.0	2331490.5	
226	Spicebush		229294.3	2331550.0	
227	Spicebush		229282.8	2331550.5	
228	Silver Maple		229289.3	2331565.5	
229	Silver Maple		229278.8	2331580.5	
230	Silver Maple		229270.8	2331561.0	
231	Spicebush		229262.8	2331576.0	
232	Gray Birch		229254.0	2331597.5	
233	Eastern Red Cedar		229207.3	2331555.0	
234	Silver Maple		229178.8	2331473.5	
235	American Black Elderberry		229165.3	2331476.5	
236	American Black Elderberry		229160.3	2331496.9	
237	Silver Maple		229147.8	2331491.5	
238	Silver Maple		229146.3	2331510.0	
239	Silver Maple		229128.3	2331498.5	
240	American Black Elderberry		229130.7	2331514.9	
241	Hophornbeam		229216.8	2331607.3	
242	Hophornbeam		229232.8	2331618.4	
243	Hophornbeam		229216.6	2331628.0	
244	Bayberry		229205.0	2331617.1	
245	Spicebush		229202.6	2331640.5	
246	Black Cherry		229190.1	2331641.4	
247	Arrowwood Viburnum		229167.9	2331601.2	
248	Pin Oak		229165.4	2331619.7	
249	Pin Oak		229154.5	2331605.5	
250	Arrowwood Viburnum		229138.4	2331609.0	
251	Gray Birch		229146.6	2331623.8	
252	Arrowwood Viburnum		229149.0	2331640.0	
253	River Birch	6′	229116.9	2331605.9	
254	Black Cherry		229122.3	2331630.0	
255	Arrowwood Viburnum		229096.5	2331644.0	
256	Buckeye		229081.5	2331644.0	
257	Red Maple	1.5 - 10′	229093.0	2331521.3	
258	Red Maple	1.5 - 10′	229081.0	2331540.8	
259	Red Maple	1.5 - 10′	229071.0	2331520.3	
260	Bayberry		229056.3	2331523.5	
261	Red Maple	1.5 - 10′	229060.6	2331539.4	
262	Bayberry		229070.3	2331551.5	
263	Bayberry		229048.3	2331554.5	
264	Black Gum	10′	229038.4	2331571.9	
265	Gray Birch		229041.5	2331612.0	
266	Arrowwood Viburnum		229028.0	2331611.0	
267	Gray Birch		229026.5	2331597.3	
268	Arrowwood Viburnum		229017.5	2331593.3	
269	Eastern Red Cedar		229004.9	2331631.3	
270	Red Chokeberry		229000.5	2331619.0	
271	Red Chokeberry		228990.9	2331591.0	
272	Red Chokeberry		228987.1	2331599.6	
273	Arrowwood Viburnum		228979.0	2331607.0	
274	Silver Maple		228971.5	2331629.0	
275	Arrowwood Viburnum		228968.5	2331639.5	
276	Eastern White Pine	6′	228954.3	2331639.6	

Stage 2 Plantings Fall 2021

Number	Plants	Size	Northing	Easting
277	Arrowwood Viburnum		228942.2	2331643.1
278	Eastern Redbud		228976.2	2331550.4
279	Witch Hazel		228944.0	2331555.8
280	Eastern Redbud		228925.7	2331563.4
281	Eastern Redbud		228921.2	2331580.9
282	Eastern Redbud		228905.7	2331572.4
283	Witch Hazel		228917.0	2331596.8
284	Pin Oak		228902.2	2331592.4
285	Witch Hazel		228892.0	2331580.3
286	Eastern Redbud		228913.5	2331623.5
287	Black Gum	10′	228899.5	2331634.5
288	Silver Maple		228876.3	2331615.0
289	Buckeye		228865.0	2331634.0
290	Black Cherry		228847.0	2331633.5
291	Spicebush		228868.0	2331651.5
292	Eastern White Pine	4′	228856.0	2331651.0
293	Black Cherry		228838.5	2331651.0
294	Pin Oak		228824.8	2331599.0
295	High-Bush Blueberry		228822.7	2331611.4
296	Silver Maple		228815.3	2331623.5
297	Silver Maple		228805.8	2331606.5
298	High-Bush Blueberry		228803.2	2331620.4
299	Black Cherry		228805.3	2331638.8
300	Pin Oak		228798.0	2331654.0
301	Pin Oak		228783.0	2331640.5
302	Black Gum	10′	228782.5	2331668.3
303	Red Chokeberry		228769.2	2331666.8
304	Red Chokeberry		228775.9	2331656.6
305	Eastern Redbud		228762.1	2331633.9
306	High-Bush Blueberry		228753.0	2331640.9
307	Allegheny Serviceberry		228748.0	2331658.0
308	Common Serviceberry		228737.9	2331655.0
309	Spicebush		228741.8	2331664.5
310	River Birch	10′	228737.7	2331701.0
311	Black Locust		228736.1	2331723.7
312	Black Cherry		228711.0	2331746.5
313	Arrowwood Viburnum		228699.9	2331760.5
314	Arrowwood Viburnum		228710.9	2331768.3
315	Black Cherry		228701.5	2331776.5
316	Spicebush		228706.3	2331800.5
317	Red Chokeberry		228750.6	2331784.1
318	Silver Maple		228765.8	2331782.5
319	Eastern Red Cedar		228779.8	2331776.0
320	Eastern White Pine	6′	228751.4	2331739.4
321	Arrowwood Viburnum		228763.9	2331729.5
322	River Birch	10′	228817.6	2331689.8
323	Black Locust		228817.2	2331741.3
324	Spicebush		228822.1	2331753.7
325	Eastern Red Cedar		228844.3	2331723.5
326	Black-haw Viburnum		228860.0	2331704.0
327	Eastern White Pine	4′	228878.7	2331766.0
328	Bayberry		228866.8	2331776.5
329	Eastern White Pine	4′	228878.2	2331786.0
330	Buckeye		228805.1	2331808.9
331	Black Cherry		228819.5	2331825.5
332	Spicebush		228850.6	2331858.2
333	Mountain Witchalder		228864.6	2331861.6
334	Red Chokeberry		228868.7	2331847.3
335	American Black Elderberry		228904.1	2331883.6
336	Black Cherry		228921.0	2331872.0
337	American Black Elderberry		228922.4	2331885.4
338	Pin Oak		228936.5	2331886.5
339	Eastern White Pine	4′	228944.7	2331831.5
340	Pin Oak		228915.9	2331809.0
341	Black Locust		228931.9	2331797.5
342	Pin Oak		228946.9	2331795.0
343	Arrowwood Viburnum		228938.3	2331760.6
344	Gray Birch		228951.0	2331761.3
345	Arrowwood Viburnum		228942.5	2331751.0

Stage 2 Plantings Fall 2021

Number	Plants	Size	Northing	Easting
346	Gray Birch		228937.0	2331722.9
347	Black Cherry		228919.5	2331717.5
348	Black-haw Viburnum		228942.0	2331686.5
349	Black-haw Viburnum		228951.8	2331691.4
350	River Birch	10′	228973.7	2331669.8
351	Pin Oak		228977.9	2331706.0
352	Black-haw Viburnum		228964.0	2331731.0
353	Gray Birch		228975.8	2331738.9
354	Black Gum	6′	229001.0	2331771.8
355	Sweetgum		229016.7	2331783.8
356	Black Locust		229007.2	2331820.3
357	Black Locust		229058.1	2331813.9
358	Pin Oak		229058.9	2331796.0
359	Black Cherry		229048.0	2331740.2
360	Pin Oak		229036.9	2331723.0
361	Gray Birch		229046.0	2331694.5
362	River Birch	6′	229086.1	2331675.3
363	American Black Elderberry		229097.5	2331705.1
364	Gray Birch		229099.4	2331727.2
365	American Black Elderberry		229089.5	2331740.6
366	Gray Birch		229105.6	2331745.0
367	American Black Elderberry		229107.0	2331761.1
368	Bayberry		229169.4	2331842.6
369	American Hornbeam		229185.1	2331844.7
370	Bayberry		229193.2	2331870.4
371	Black Cherry		229209.0	2331870.2
372	American Black Elderberry		229202.0	2331883.6
373	Pin Oak		229216.8	2331889.0
374	Pin Oak		229252.3	2331893.5
375	River Birch	6′	229211.1	2331935.4
376	American Black Elderberry		229209.0	2331959.5
377	River Birch	6′	229181.4	2331948.9
378	River Birch	6′	229171.9	2331931.4
379	American Black Elderberry		229157.0	2331937.1
380	Red Maple	1.5 - 10′	229145.4	2331894.5
381	Speckled/Gray Alder		229074.9	2331853.5
382	Black-haw Viburnum		229026.0	2331910.0
383	American Black Elderberry		228944.1	2331914.6
384	American Black Elderberry		228950.6	2331937.1
385	Black Cherry		228963.2	2331937.2
386	Sweetgum		228993.6	2331966.5
387	Red Chokeberry		228995.0	2331979.0
388	Sweetgum		229009.6	2331979.5
389	Black-haw Viburnum		229041.6	2332008.7
390	Eastern Red Cedar		229049.3	2332018.0
391	Spicebush		229045.8	2332029.0
392	Red Chokeberry		229056.2	2332028.7
393	American Hornbeam		229098.0	2331953.0
394	Spicebush		229097.1	2331968.7
395	Spicebush		229116.4	2331981.3
396	River Birch	10′	229114.9	2331997.9
397	River Birch	10′	229130.9	2331988.4
398	Eastern Red Cedar		229144.8	2332020.8
399	River Birch	6′	229154.4	2332033.9
400	River Birch	6′	229172.1	2332019.1
401	Spicebush		229198.0	2332038.5
402	Red Maple	1.5 - 10′	229157.8	2332081.9
403	Red Chokeberry		229145.0	2332101.0
404	River Birch	10′	229124.1	2332112.9
405	River Birch	10′	229121.5	2332091.6
406	Arrowwood Viburnum		229100.1	2332106.4
407	River Birch	10′	229097.9	2332093.0
408	Arrowwood Viburnum		229096.3	2332078.8
409	Black Gum	6′	229110.8	2332075.0
410	Red Maple	1.5 - 10′	229113.8	2332056.2