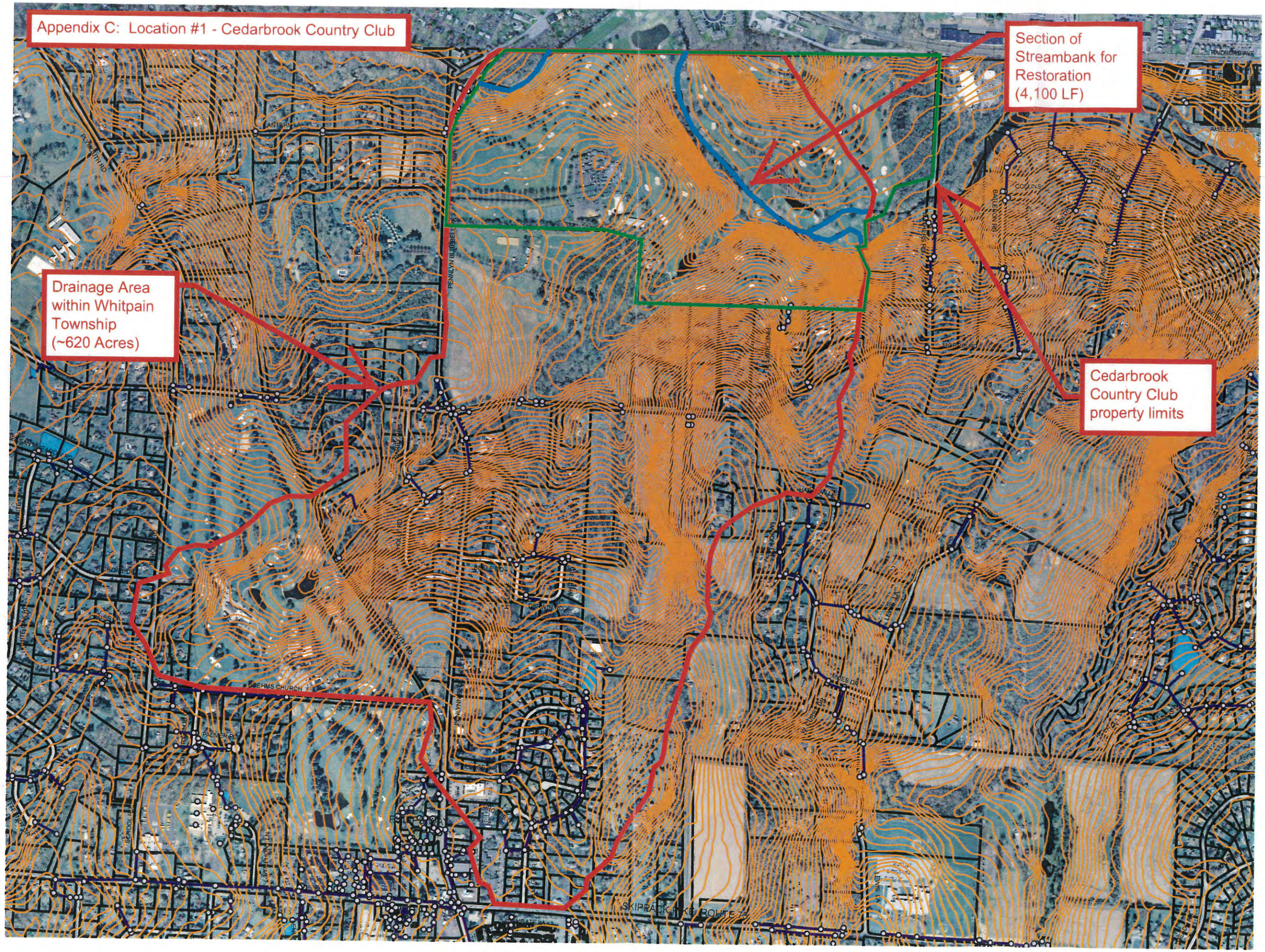
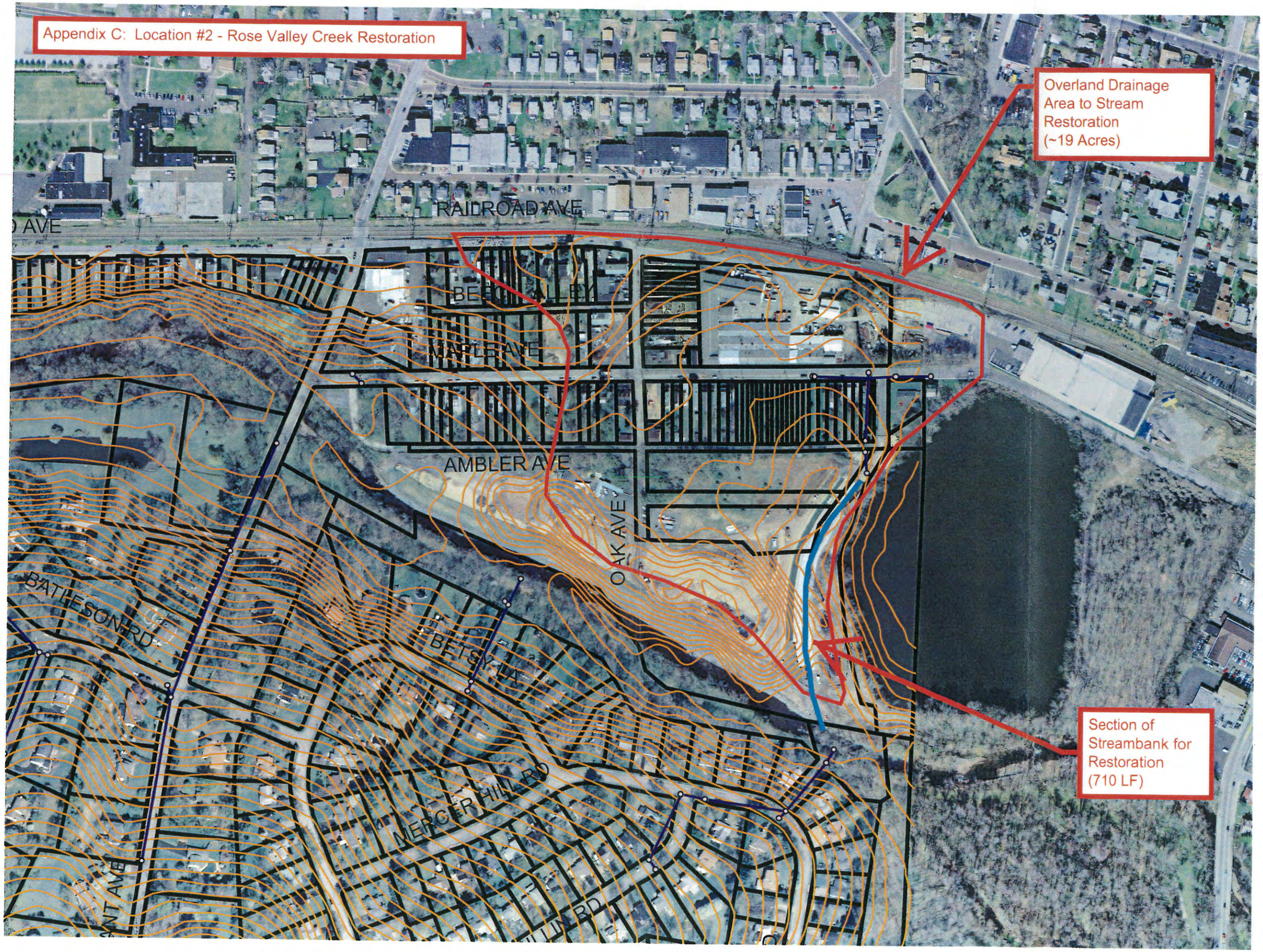
APPENDIX C

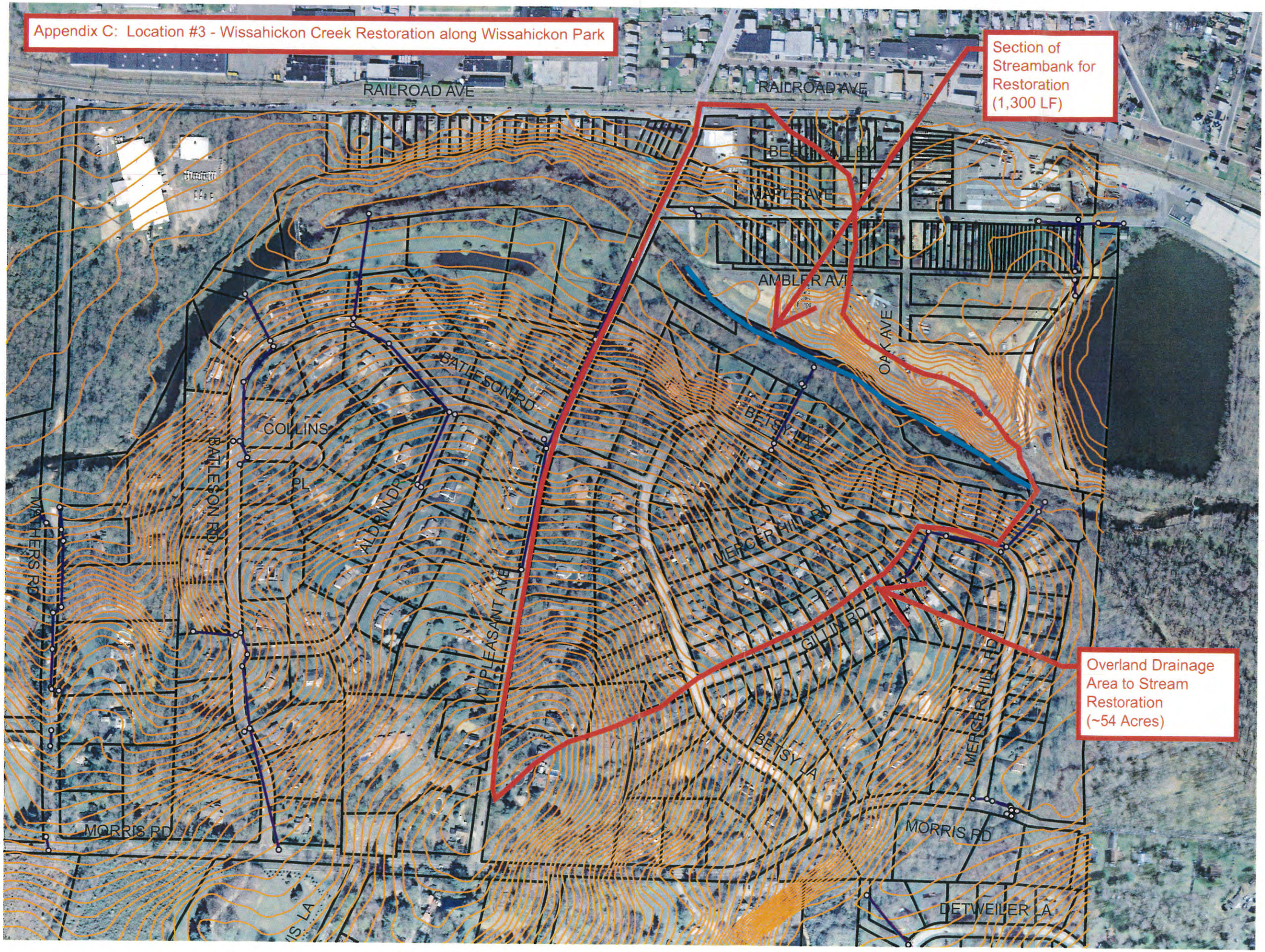
Appendix C: Location #1 - Cedarbrook Country Club



Appendix C: Location #2 - Rose Valley Creek Restoration



Appendix C: Location #3 - Wissahickon Creek Restoration along Wissahickon Park



TMDL Strategy – Stream Restoration and Stabilization

Location #1:
Cedarbrook Country Club
180 Penllyn-Blue Bell Pike
Blue Bell, PA 19422

Property Size:
202.74 Acres

Length of stream to be Restored/Stabilized:
4,100 linear feet within Whitpain Township (5,500 LF total)

Overall Drainage Area within Whitpain Township that drains to this section of the stream:
Approximately 620 acres

Project Timeline:
The estimated start date for this stream restoration project would be in 2018. Project is estimated to be completed in 2021.

Project Description:
Through restoration and stabilization of the streambank, the work to be carried out on this property would mitigate erosion, flooding and nonpoint source pollution in the project location as well as downstream in West Ambler.

As this project centers on the streambank restoration and stabilization for the primary purpose of reducing flooding locally and downstream, outcomes will be self-evident as flooding in the references areas will be mitigated.

The stabilization methods that will be used are known to reduce suspended solids in the stream by up to 61%. Similar results are expected under this project. Additionally, by reducing sediment, there will be less deposition and resultant flooding along downstream properties.

TMDL Calculations:
Utilize the revised interim removal rate for Edge of Field sediment removal for the calculation of the TSS removed as part of this stream restoration project (248 lb/ft). As per the PaDEP TMDL training seminar in March, 2015.

(4,100 linear feet of stream bank) * (248 lb/ft) = 1,016,800 lb/yr of sediment removed

Location #2:
Terminus of Rose Valley Creek, where it intersects with the Wissahickon Creek

Length of stream to be Restored/Stabilized:
710 linear feet

Overall Drainage Area within Whitpain Township that drains to this section of the stream:
Approximately 19 acres of overland flow (Does not include flows down Rose Valley Creek)

Project Description:
As part of the USEPA's Superfund project within Whitpain Township, the portion of the Rose Valley Creek that splits the Wissahickon Park and neighboring reservoir has undergone a streambank restoration and stabilization. The channel bottom and embankments have been lined with concrete cable mats (CCM), rip-rap and erosion stabilization matting to reduce the amount of suspended solids being washed into the Wissahickon Creek during rain events.

Project Timeline:
This project has been constructed and the installed BMP Control Measure was completed in 2011.

TMDL Calculations:
Utilize the revised interim removal rate for Edge of Field sediment removal for the calculation of the TSS removed as part of this stream restoration project (248 lb/ft). As per the PaDEP TMDL training seminar in March, 2015.

(710 linear feet of stream bank) * (248 lb/ft) = 176,080 lb/yr of sediment removed

Location #3:
Section of the Wissahickon Creek along the former Wissahickon Park property. Property is currently part of the BoRIT Superfund site that is being stabilized by the USEPA.

Length of stream to be Restored/Stabilized:
1,300 linear feet

Overall Drainage Area within Whitpain Township that drains to this section of the stream:
Approximately 54 acres of overland flow (Does not include flows down Wissahickon Creek)

Project Description:
As part of the USEPA's Superfund project within Whitpain Township, the portion of the Wissahickon Creek that traverses along the edge of the Wissahickon Park property has undergone a streambank restoration and stabilization. The channel embankment along the side of the Park property has been stabilized with matting, rip-rap and HDPE geocells to improve flood control and to reduce the amount of suspended solids being washed into the Wissahickon Creek during rain events.

Project Timeline:
This project has been constructed and the installed BMP Control Measure was completed in 2009.

TMDL Calculations:
Utilize the revised interim removal rate for Edge of Field sediment removal for the calculation of the TSS removed as part of this stream restoration project (248 lb/ft). As per the PaDEP TMDL training seminar in March, 2015.

(1,300 linear feet of stream bank) * (248 lb/ft) = 322,400 lb/yr of sediment removed

Total Sediment Removed from three project sites = 1,515,280 lb/yr

Stream Restoration & Stabilization

Table 3. Edge-of-Stream 2011 Interim Approved Removal Rates per Linear Foot of Qualifying Stream Restoration (lb/ft/yr)			
Source	**TN**	**TP**	**TSS***
Interim CBP Rate	0.20	0.068	310 (54.25)*
Revised Interim Rate	0.075	0.068	248 (43.4)*

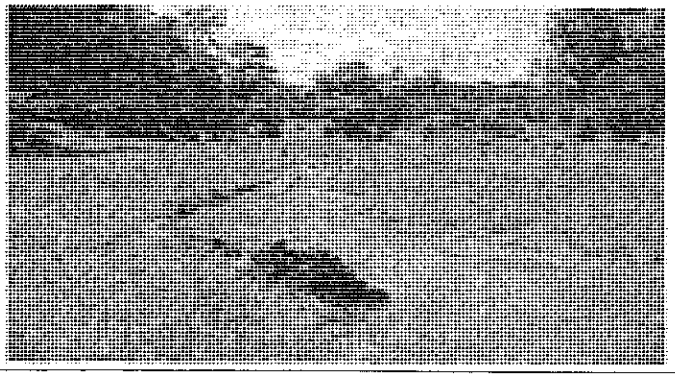
- Edge of Field (EOF) and Sediment Delivery Rate (SDR) to the Chesapeake Bay;
- These are Revised Interim Rates that are used for planning purposes (SDR) and/or Progress Reporting (EOF);
- May not always be obvious, but in-stream sediment load reductions based on the Protocol 1 field assessments may be significantly higher.

CENTER FOR WATERSHED PROTECTION

Stream Restoration & Stabilization

- For workshop exercises, we'll use the revised interim removal rate for Edge of Field: 248 lb/ft;
- **Reduction:** 1,000 lf of stream restoration

  = 1,000 ft * 248lb/ft = 248,000 lb/yr



CENTER FOR WATERSHED PROTECTION

Stream Restoration and Stabilization at Rose Valley Creek and Wissahickon Creek as part of the BoRIT Superfund site (2008 – 2015)

All the pictues below are for the Wissahickon Creek (WC) Bank adjacent to the Park Property

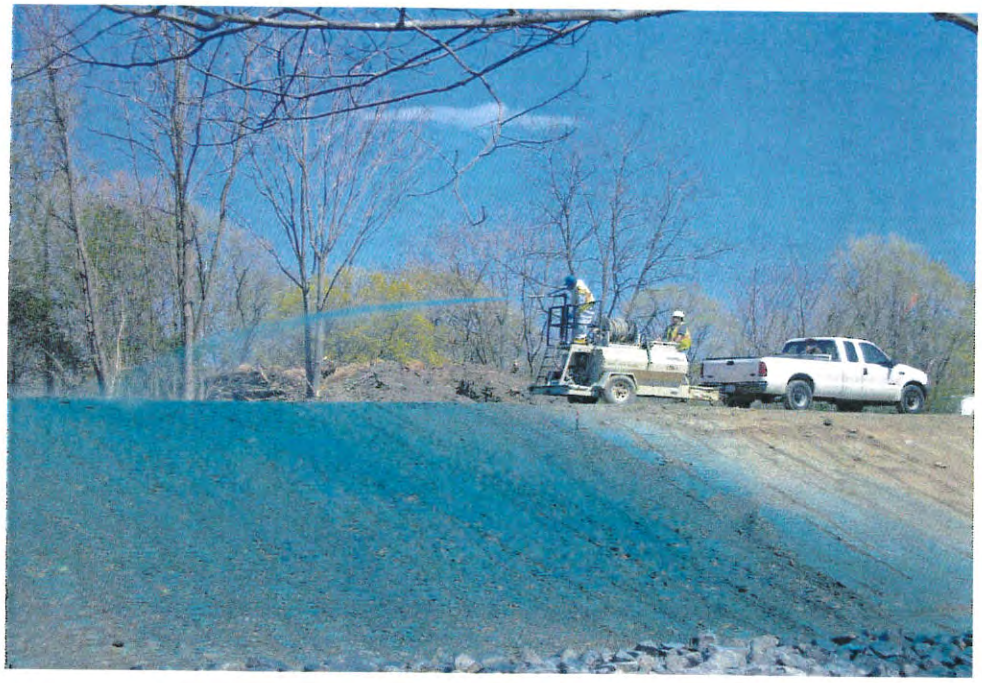
The picture above shows asbestos-containing material (ACM) along the WC bank adjacent to the park property. All the big pieces were picked up and put in roll-offs, which were sent out for proper off-site disposal.

Same as the picture above.

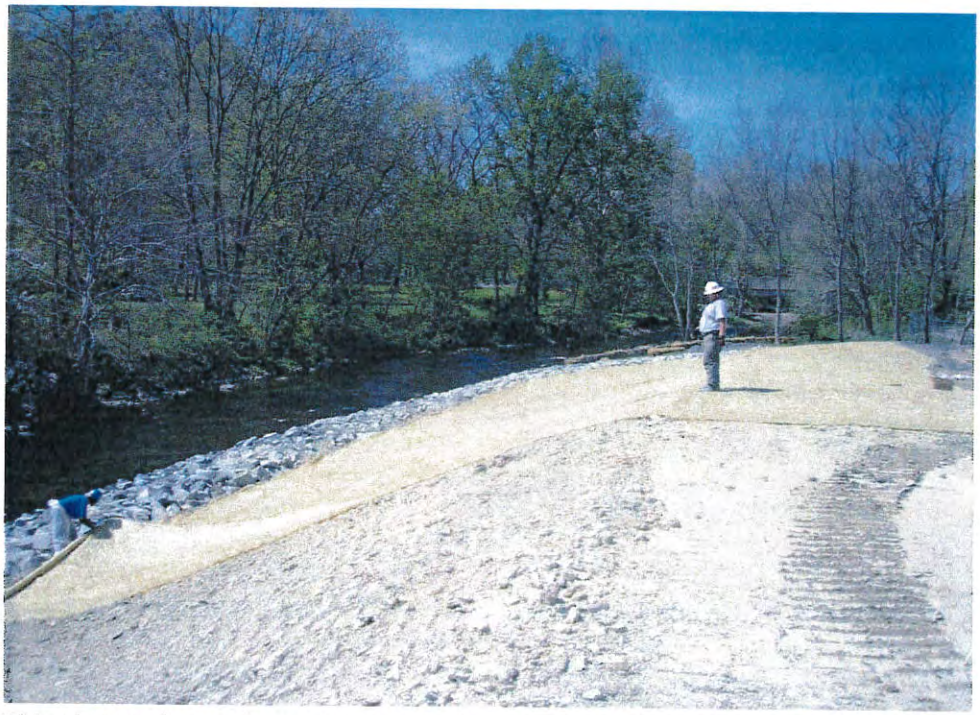
This picture shows the geocells on the slope and how the first few feet from the water's edge were filled with stone and then riprap (boulders) over the area to protect that section from strong flow during heavy rain events.

This picture shows the layer of geotextile fabric (where the guys are) used to cover the slope prior to installing the geocells.

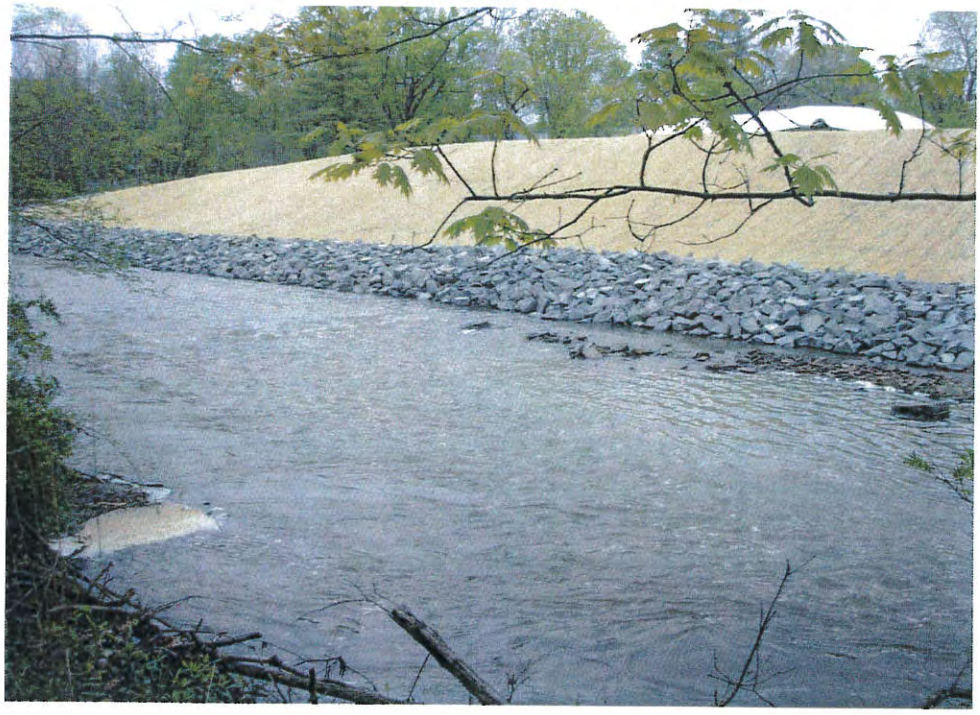
This picture shows how the geocells were filled with topsoil. It also show the tendons (yellow strings) which were used to anchor the geocells at the top of the slope.



This picture show the contractors hydro-seeding (green stuff) the slope (topsoil). The mix was recommended by Bruce Pluta (BTAG).



This picture shows the contractors installing the erosion mats on the already hydro-seeded slope.



This picture show a profile of the completed stream bank.

This picture shows how well the vegetation took.

Same as above.

All the pictues below are for Rose Valley Creek, between the Park and the Pond Properties

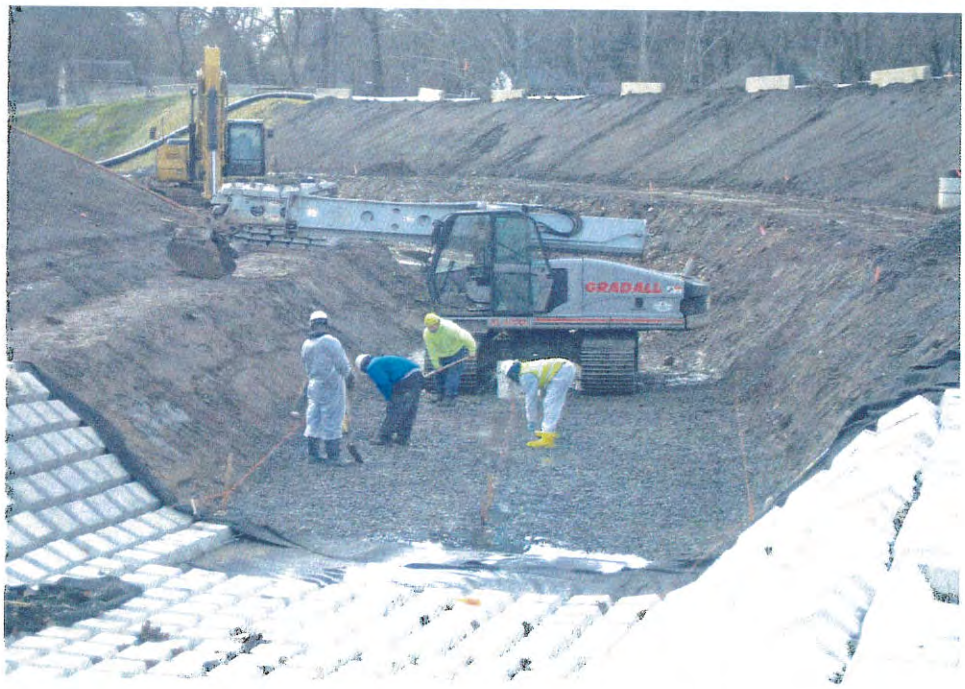
The picture above shows asbestos-containing material (ACM) in Rose Valley Creek. All the big pieces were picked up and put in roll-offs, which were sent out for proper off-site disposal.

Same as above.

The picture above shows asbestos-containing material (ACM) along the slope by Rose Valley Creek. All the big pieces were picked up and put in roll-offs, which were sent out for proper off-site disposal.

This picture shows the retaining wall that was built to protect the Rose Valley Creek bank/slope, which is also the berm of the pond along that section.

To be able to "work dry," we bypassed Rose Valley Creek through the pipe shown above.



This picture shows how the channel was widened, the floor was leveled with stone, the geotextile fabric was installed and then the cable concrete mats (CCMs) were installed from one side, across and then over to the other side.

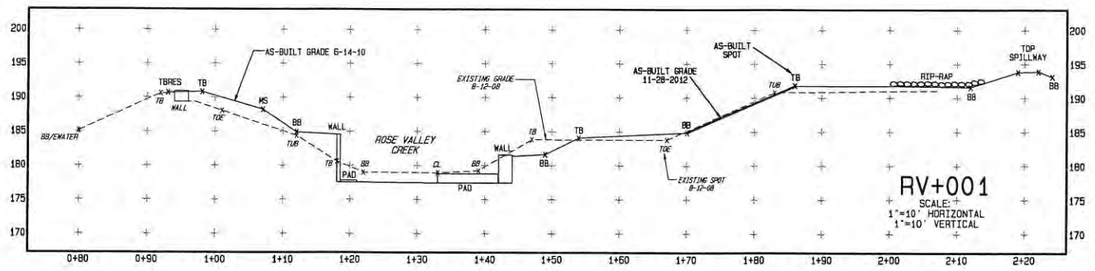
This picture shows the CCMs and the heavy erosion mat that was used on the "upper slope," adjacent to the Park property.

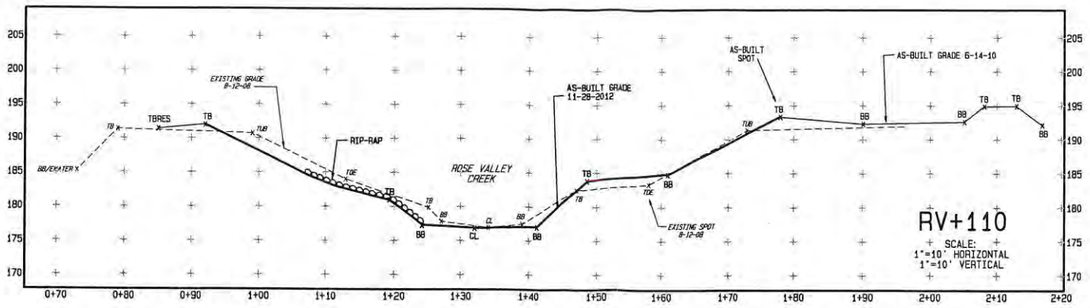
The gaps of the CCMs were filled with topsoil, as well as the erosion mat on the "upper slope." Both areas were then hydro-seeded to promote vegetation.

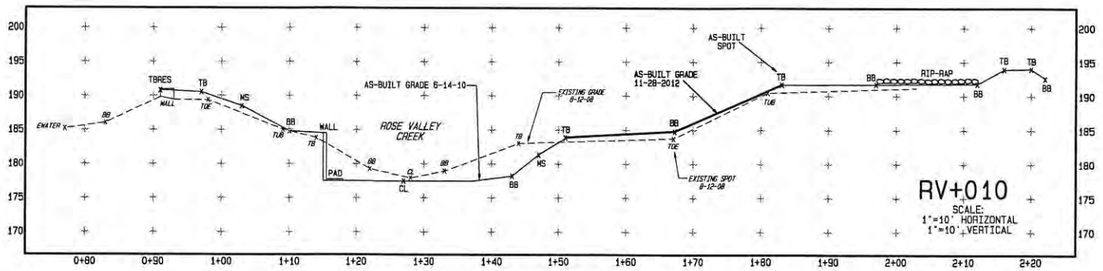
Riprap was added along the toe of the stream banks to help keep everything in place, especially during big storm events.

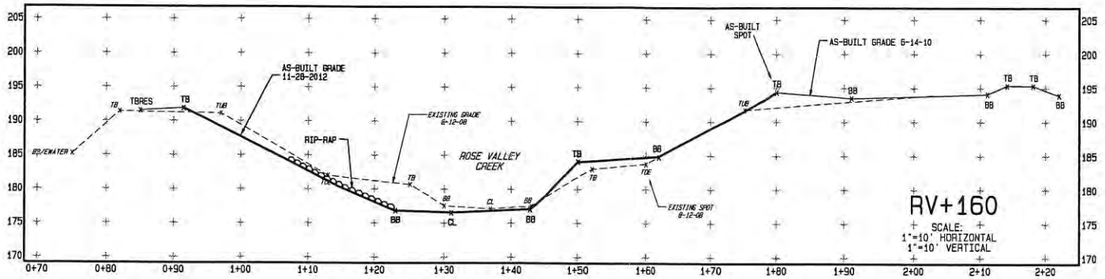
This picture shows the outside section of the pond's berm closest to Rose Valley Creek ready for hydro-seeding and the erosion mats.

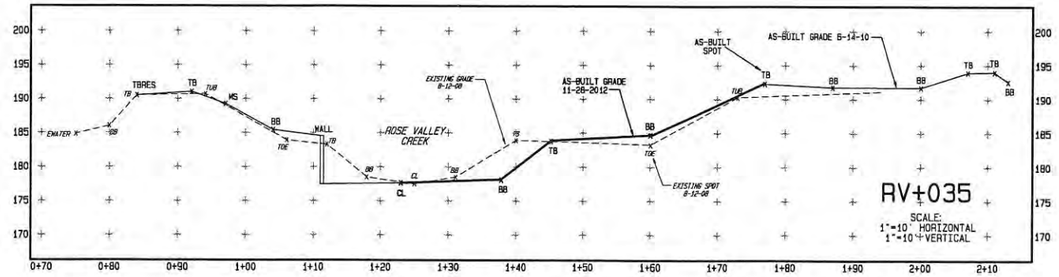
As-Built Cross-Section Plans of the Rose Valley Creek – Stream Restoration and Stabilization

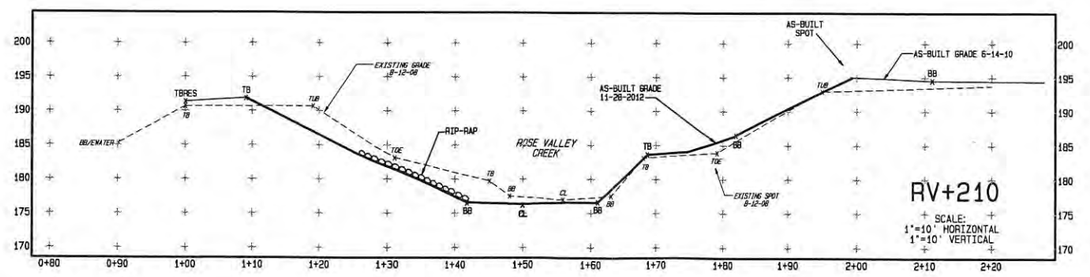


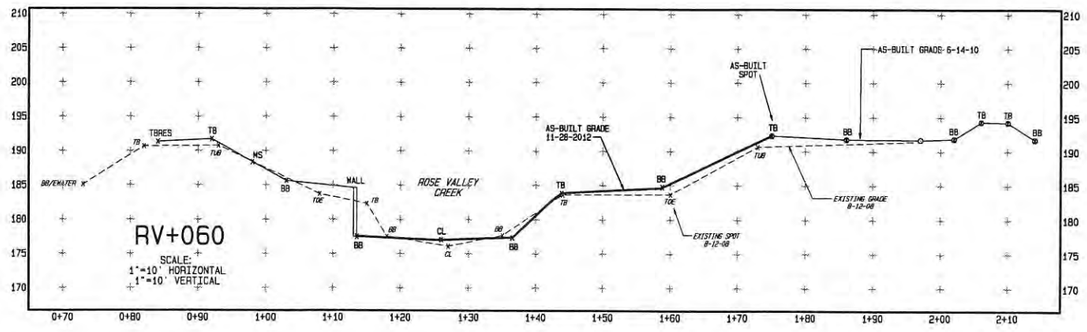












ROSE VALLEY RECONSTRUCTION
AS-BUILT 11-28-2012
CROSS SECTION PROFILES

SITUATE IN:
WHITPAIN TOWNSHIP
MONTGOMERY COUNTY,
PENNSYLVANIA

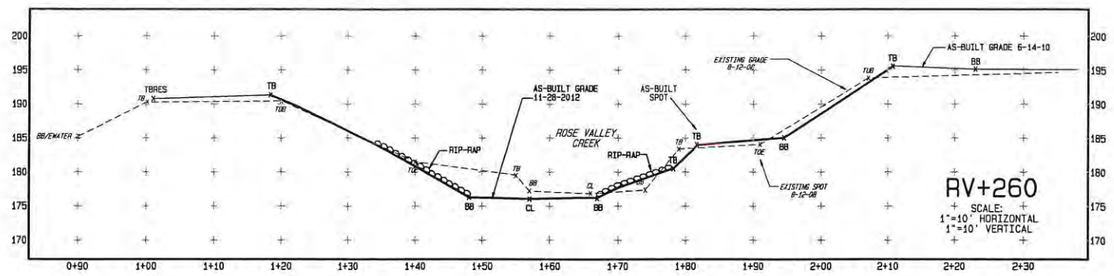
BORIT ASBESTOS PILE

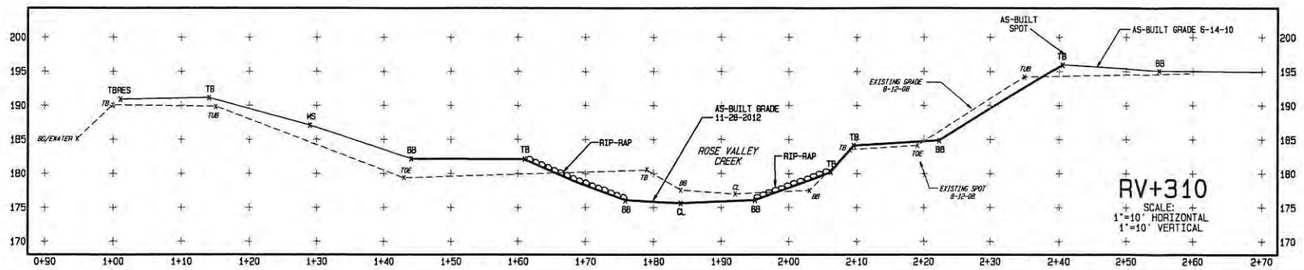
REVISION	DATE	DESCRIPTION

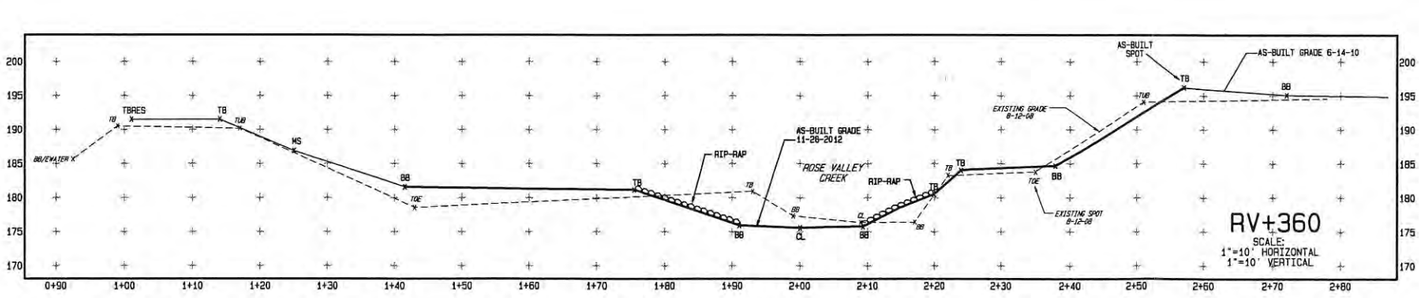
Ludgate Engineering Corporation
ENGINEERS SURVEYORS PLANNERS
ENVIRONMENTAL SCIENTISTS
© 2010

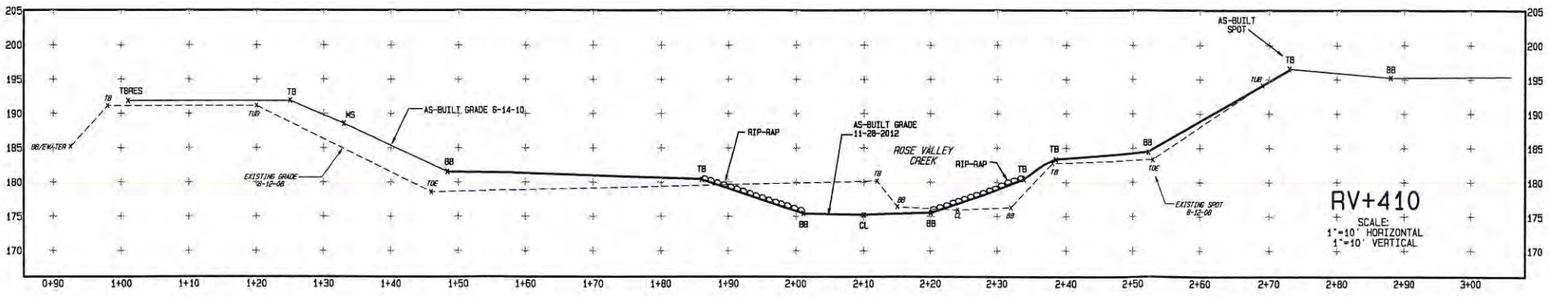
LINCOLN CORPORATE CENTER
10 VANGUARD DRIVE, SUITE 90
READING, PA 19606
PHONE 610-404-7330
FAX 610-404-7371

DRAWN	COMP (END)#	COMP (LOT)#	PA ONE CALL DATE	COMPUTER FILE
PSR				P:7801508-PWSEIII-11-AB.PRD
12-10-12				
SCALE	TAX MAP PARCEL			DRAWING NUMBER
AS NOTED	SEE ABOVE			D-7801508-AB SHEET 4









ROSE VALLEY RECONSTRUCTION
AS-BUILT 11-28-2012
CROSS SECTION PROFILES

SITUATE IN:
WHITPAIN TOWNSHIP
MONTGOMERY COUNTY,
PENNSYLVANIA

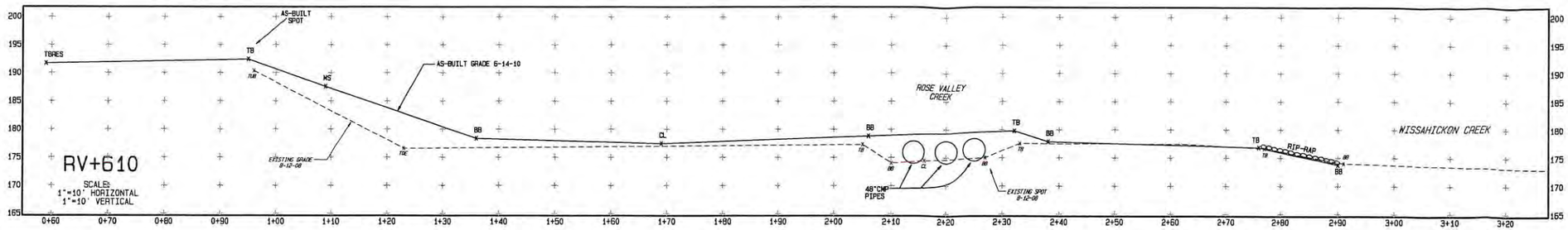
BORIT ASBESTOS PILE

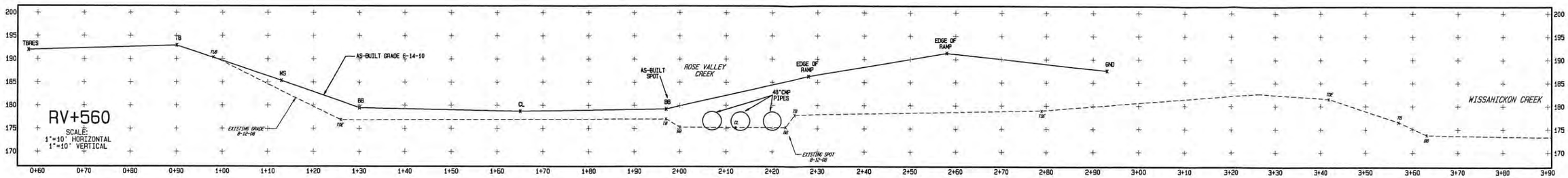
Ludgate Engineering Corporation
ENGINEERS SURVEYORS PLANNERS
ENVIRONMENTAL SCIENTISTS
© 2010

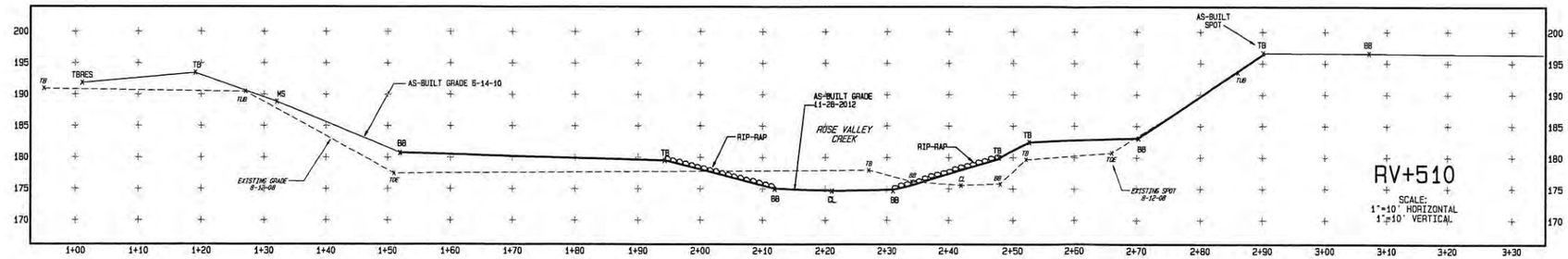
LINCOLN CORPORATE CENTER
10 VANGUARD DRIVE, SUITE 90
READING, PA 19606
PHONE 610-404-7330
FAX 610-404-7371

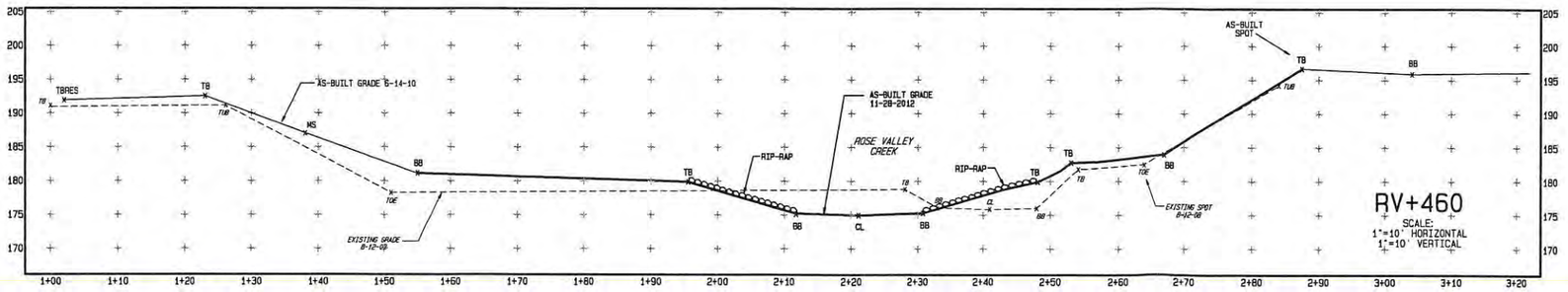
DRAWN	COMP (BNDY)	COMP (LOTS)	PA ONE CALL DATE	COMPUTER FILE
PSR				P:\7801508-PHASEIII-II-AB.PRO
12-10-12				
SCALE	TAX MAP PARCEL		DRAWING NUMBER	
AS NOTED	SEE ABOVE		D-7801508-AB SHEET 5	

REVISION	DATE	DESCRIPTION









ROSE VALLEY RECONSTRUCTION
AS-BUILT 11-28-2012
CROSS SECTION PROFILES

SITUATE IN:
WHITPAIN TOWNSHIP
MONTGOMERY COUNTY,
PENNSYLVANIA

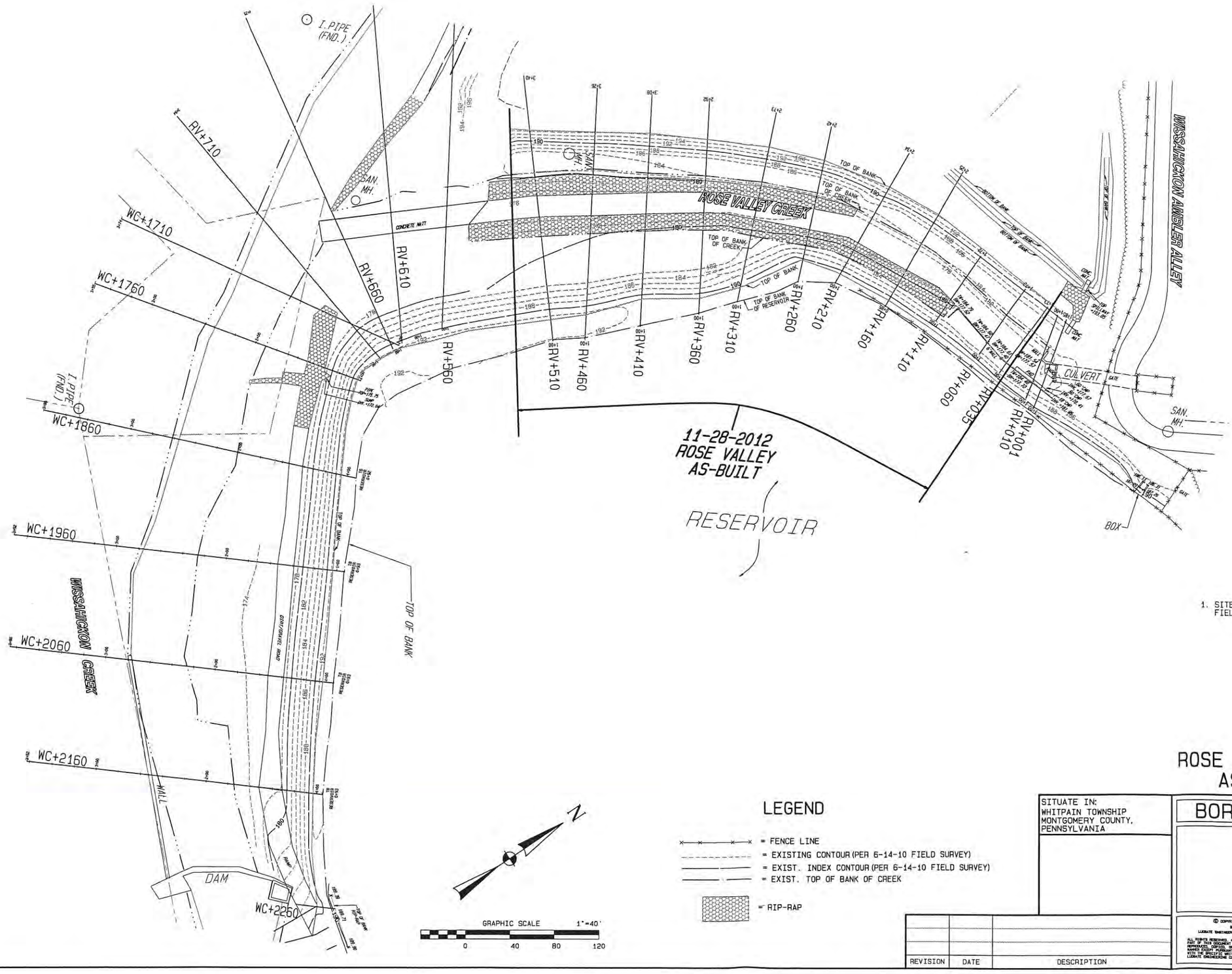
REVISION	DATE	DESCRIPTION

BORIT ASBESTOS PILE

Ludgate Engineering Corporation
ENGINEERS SURVEYORS PLANNERS
ENVIRONMENTAL SCIENTISTS
© 2010

LINCOLN CORPORATE CENTER
10 VANGUARD DRIVE, SUITE 90
READING, PA 19606
PHONE 610-404-7330
FAX 610-404-7371

DRAWN	COMP (ENGR)	COMP (LOTS)	PA ONE CALL DATE	COMPUTER FILE
PSR				P:7801508-PHASEIII-11-AB.PRO
12-10-12				
SCALE	TAX MAP PARCEL		DRAWING NUMBER	
AS NOTED	SEE ABOVE		D-7801508-AB SHEET 6	



NOTES

1. SITE FEATURES PER LUDGATE ENGINEERING CORPORATION FIELD SURVEY OF 11-28-2012.

LEGEND

= FENCE LINE
= EXISTING CONTOUR (PER 6-14-10 FIELD SURVEY)
= EXIST. INDEX CONTOUR (PER 6-14-10 FIELD SURVEY)
= EXIST. TOP OF BANK OF CREEK
= RIP-RAP

ROSE VALLEY RECONSTRUCTION
AS-BUILT 11/28/2012

SITUATE IN:
WHITPAIN TOWNSHIP
MONTGOMERY COUNTY,
PENNSYLVANIA

BORIT ASBESTOS PILE

REVISION	DATE	DESCRIPTION

Ludgate Engineering Corporation
ENGINEERS SURVEYORS PLANNERS
ENVIRONMENTAL SCIENTISTS
© 2010
LINCOLN CORPORATE CENTER
10 VANGUARD DRIVE, SUITE 90
READING, PA 19606
PHONE 610-404-7330
FAX 610-404-7371

DRAWN	COMP (BNDY)	COMP (LOT#)	PA ONE CALL DATE	COMPUTER FILE
PSR				P:\7801508-PHASEIII-II-AB.PRO
12-10-12				
SCALE	TAX MAP PARCEL		DRAWING NUMBER	
1"=40'	SEE ABOVE		D-7801508-AB	SHEET 1

we grow communities

TRIAD ASSOCIATES

June 29, 2015

PA Department of Community and Economic Development
Office of Innovation and Investment – CFA Programs Division
Flood Protection Program
Commonwealth Keystone Building
400 North Street, 4th Floor
Harrisburg, PA 17120-0025

RE: Application for Commonwealth Finance Authority's (CFA) Flood Mitigation Program – Whitpain Township/Cedarbrook Country Club

Dear Sir or Madam,

At the request of Roman Pronczak, Township Manager for Whitpain Township I am enclosing three copies of Whitpain Township's application for Flood Mitigation Program Funding. Included in this package is the Standard Application, Exhibits and Attachments documenting the need for flood mitigation funding. A check in the amount of $100.00 from the Township is also enclosed.

An electronic copy of the Standard Application was forwarded to your office on June 29, 2015.

If in your review of the enclosed application package you have any questions or require additional information please feel free to contact me or Township Manager, Roman Pronczak.

Sincerely,

Michael L. Zumpino
Chairman/CEO

Cc: Roman Pronczak, Township Manager, Whitpain Township
Dennis Miranda, Executive Director Wissahickon Valley Watershed Association
Michael Keller, President, Board of Governors, Cedarbrook Country Club
Thomas Duffy, Board of Governors, Cedarbrook Country Club
Todd Noon, Associate, Triad Associates

Single Application for Assistance

Web Application Id: 8065830 **Single Application Id: 201506298786**
Applicant: Whitpain Township
Program Selected: Flood Mitigation Program

Applicant Information

Applicant Entity Type: Government
Applicant Name: Whitpain Township
NAICS Code 9211
FEIN/SSN Number XXXXXXXXX

CEO: Roman M. Pronczak
CEO Title: Township Manager
SAP Vendor #: XXXXXX

Contact Name: Todd Noon
Contact Title: Associate
Phone: (856)-690-9590 Ext. 112
Fax: (856)-690-5622
E-mail: tnoon@triadincorporated.com
Mailing Address: 1301 W. Forest Grove Rd.
City: Vineland
State: NJ
Zip Code: 08360

Single Application for Assistance

Web Application Id: 8065830 **Single Application Id:** 201506298786
Applicant: Whitpain Township
Program Selected: Flood Mitigation Program

EnterpriseType

Government,

Single Application for Assistance

Web Application Id: 8065830 **Single Application Id:** 201506298786
Applicant: Whitpain Township
Program Selected: Flood Mitigation Program

Project Overview

Project Name:
Wissahickon Creek Streambank Restoration and Stabilization

Is this project related to another previously submitted project?
No

If yes, indicate previous project name:

Have you contacted anyone at DCED/Governor's Action Team about your project?
No

If yes, indicate who:

Single Application for Assistance

Web Application Id: 8065830 **Single Application Id: 201506298786**
Applicant: Whitpain Township
Program Selected: Flood Mitigation Program

Project Site Locations

Address: 180 Penllyn Pike
City: Blue Bell
State: PA
Zip Code: 19422
County: Montgomery
Municipality: Whitpain Township
PA House: Kate Harper (61)
PA Senate: Daylin Leach (17)
US House: Pat Meehan (7)
Current Employees:
Jobs To Be Created: 0
Designated Areas: