

POLLUTANT REDUCTION PLAN

WHITE OAK BOROUGH
ALLEGHENY COUNTY, PA

PREPARED BY



Senate Project No. 13220

March 2020
Revised November 2021

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SECTION 1: INTRODUCTION

White Oak Borough (Borough) is located in Allegheny County, PA. A Location Map showing the Borough municipal boundary is found in Appendix A. The Borough is an entirely urbanized area as defined and delineated by the U.S. Census Bureau, and these urbanized areas are subject to MS4 regulations. The Borough has identified stormwater discharges to local surface waters that are designated as impaired due to sediment and nutrients. As a result, MS4 regulations dictate that the Borough must prepare and submit a Pollutant Reduction Plan (PRP). The PRP must contain calculations that determine the existing loading of the pollutant(s) of concern in lbs/yr, the minimum reduction in loading in lbs/yr, select Best Management Practices (BMPs) to reduce loading, and demonstrate that the selected BMP(s) will achieve the minimum required reductions.

Long Run, Crooked Run, Jacks Run, Youghiogheny River, Stewartsville Run Road, McKee Run Road, and Monongahela River all accept stormwater discharges within the Borough; however, only Crooked Run, Long Run, and McKee Run Road are designated as impaired due to sediment/siltation. Long Run is impaired due to Road Runoff - Siltation; Road Runoff – Cause Unknown; and Atmospheric Deposition - pH. Crooked Run is impaired due to Bank Modifications – Siltation. McKee Run Road is impaired due to Road Runoff and Highway/Road/Bridge Runoff – Siltation. Note that McKee Run Road is in the Long Run watershed. The Monongahela River is impaired due to Unknown Source – PCBs and Unknown Source – Pathogens. Jacks Run, Youghiogheny River, Stewartsville Run Road, McKee Run Road have no impairments listed. The PRP will address the reduction of pollutants within the Long Run watershed.

SECTION 2: PUBLIC PARTICIPATION

1. The applicant shall make a complete copy of the PRP available for public review.

The Borough of White Oak had a complete copy of the PRP available for public review. The PRP was located within the Borough office.

No comments were received.

2. The applicant shall publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the plan, where it could be reviewed by the public, and the length of time the permittee will provide for the receipt of comments. The public notice must be published at least 45 days before the deadline for submission of the PRP to PA DEP.

The Borough of White Oak published an ad in the Mon Valley Independent on February 5, 2020. Refer to Appendix B for the Legal Ad as well as the Proof of Publication. No comments were received.

3. The applicant shall accept written comments for a minimum of 30 days from the date of public notice. Attach a copy of all written comments received from the public to the PRP.

No public comments were received.

4. The applicant shall accept comments from any interested member of the public at a public meeting or hearing, which may include a regularly scheduled meeting of the governing body of the municipality or municipal authority that is the permittee.

The applicant solicited comments from the public at two public meetings. These meetings were two regularly scheduled Council Agenda meetings (February 10, 2020, and March 9, 2020). No comments were received.

5. The applicant shall consider and make a record of the consideration of each timely comment received from the public during the public comment period concerning the plan, identifying any changes made to the plan in response to the comment. Attach a copy of the permittee's record of consideration of all timely comments received in the public comment period to the PRP.

No public comments were received.

SECTION 3: MAP

Maps that identify land uses, impervious/pervious surfaces, and the storm sewers associated with each MS4 outfall that discharges to impaired surface waters have been prepared. The area, in acres, of each urbanized area that is subject to *Appendix E* of the *PAG-13 Authorization to Discharge under the NPDES General Permit for stormwater discharges from MS4s* has been calculated and is shown on the map. In addition, a map has been prepared that identifies the proposed locations of structural BMPs that will be implemented to achieve the required pollutant reduction loads. As of March 2020, the Borough is working on updating its storm system map via a full inspection inventory of its storm system. The Borough plans to conduct cleaning and televising program of its entire storm system after the map is fully updated. The provided map is the most current map of the storm system. These maps are sufficiently detailed to identify the PRP Planning Area relevant to satisfying the requirements of *Appendix E* of the *PAG-13 Authorization to Discharge under the NPDES General Permit for stormwater discharges from MS4s* and to demonstrate that BMPs will be in the appropriate storm sewer sheds to meet the requirements. The following maps can be found in Appendix C:

- Borough of White Oak: Zoning Map - identifies land uses
- Borough of White Oak: Impaired Watershed and BMP Map

SECTION 4: POLLUTANTS OF CONCERN

According to the PA DEP's eMap, the pollutants of concern for the Long Run and Crooked Run watersheds are listed as Road Runoff – Siltation and Bank Modifications – Siltation, respectively.

SECTION 5: EXISTING LOADING FOR POLLUTANTS OF CONCERN

The calculations associated with the existing loading estimate were completed in January 2020. Calculations that determine the baseline loading for each watershed are included in Appendix D.

The existing pollutant loadings were calculated using the simplified method. Per simplified method, the Impervious and Pervious urban areas were multiplied by the land loading rates. Land loading rates for the Total Nitrogen (TN), Total Phosphorous (TP), and Total Suspended Solids or Sediments (TSS) are shown below.

CATEGORY	TN ¹ (lbs/acre/yr)	TP ¹ (lbs/acre/yr)	TSS/Sediments ¹ (lbs/acre/yr)
Impervious Developed	23.06	2.28	1839.00
Pervious Developed	20.72	0.84	264.96

(1 - PRP Instruction, Attachment B: Developed Land Loading Rates for PA Counties- included in Appendix D)

Impervious Area draining to Long Run	561.60 Acres
Pervious Area draining to Long Run	2558.40 Acres
Total Urban Area Draining to Long Run	3120.00 Acres

Impervious Area draining to Crooked Run	89.28 Acres
Pervious Area draining to Crooked Run	406.72 Acres
Total Urban Area Draining to Crooked Run	496.00 Acres

The existing total sediment loading using DEP's simplified method is calculated as follows:

$(561.60 \text{ Acres} \times 1,839.00 \text{ lbs/acre/yr}) + (2558.40 \text{ Acres} \times 264.96 \text{ lbs/acre/yr}) + (89.28 \text{ Acres} \times 1,839.00 \text{ lbs/acre/yr}) + (406.72 \text{ Acres} \times 264.96 \text{ lbs/acre/yr}) = \underline{\underline{1,982,606.52 \text{ lbs/yr}}}$

Required Reduction (10% of Total Sediment Loading) = 198,260.65 lbs/yr

The MS4 permittee is required to reduce the pollutant loadings of sediment and total phosphorus (TP) by 10%, and 5% respectively. PA DEP has stated that an MS4 permittee may use the presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% total phosphorus reduction.

SECTION 6: PROPOSED BMPs

The calculation indicates that the Borough contributes 1,982,606 lbs of sediment annually to Long Run and Crooked Run. The Borough is required to reduce the amount of sediment contributed annually by 10% or 198,261 lbs within 5 years of PA DEP's approval of the coverage under the MS4 permit. The 10% reduction in the sediment will meet the required 5% reduction in nutrients as well.

The Borough has selected the following BMP(s) to be constructed to meet the 10% sediment reduction:

- Approximately 2,900 linear feet of Streambank Restoration on Long Run along Lincoln Way – 44.88 lbs/ft/yr of sediment removal
- 2,300 linear feet of Streambank Restoration on Lower Heckman Run and UNT of Jack's Run - 44.88lbs/ft/yr of sediment removal

SECTION 7: BMP DESIGN

The streambank restoration will be completed on Long Run along Lincoln Way, a UNT running along Lower Heckman Road, and a UNT of Jack's Run running along McKee Road. Approximately 5,200 linear feet of streambank restoration will be completed to satisfy the requirements of the PRP.

A coir log streambank stabilization will be implemented for the 4,200 linear feet of the streambank and a boulder revetment with live fascines will be used along the 1,000 linear feet section of Long Run.

Sediment loading reduction calculations for streambank restoration can be found in Appendix E. According to the calculations, the total sediment removed by the planned BMP is 201,960.00 lbs/yr which satisfies the 10% reduction requirement. Construction detail of the proposed BMP can be found in Appendix F.

Please note that the proposed BMP project has not been fully designed. The project description is conceptual, and it is for planning purposes only. When designed, all proposed BMP projects will be per the DEP BMP manual and all the local ordinances and regulations. Proposed BMPs have been evaluated in terms of the feasibility and estimated pollutant load reductions to meet the goals of this plan. It is anticipated that the proposed BMP might be changed or replaced with the better and most feasible alternatives, as more information becomes available. Details for each BMP completion and change will be included in the annual status report.

SECTION 8: FUNDING MECHANISMS

A construction cost estimate for the proposed BMP can be found in Appendix E. The Borough plans to seek a grant opportunity to install the BMPs; however, if no grant monies are available, then the Borough proposes to use money from the Borough's General Funds to complete construction of the proposed BMPs.

The Borough plans to apply for the DCED's Watershed Restoration and Protection Program grant in Spring 2022 contingent upon PA DEP approval of its PRP and proposed streambank stabilization project. The Borough has also applied for the GEDTF funding.

SECTION 9: OPERATION AND MAINTENANCE OF PROPOSED BMPs

Once the above-mentioned BMPs get implemented, the Borough will be responsible for the operation and maintenance. The Borough public works department will have to make sure that the implemented BMPs continue to produce expected pollutant reductions. All the O &M activities will be reported in the Annual MS4 status report which is due on September 30th every year.

Operation and Maintenance Requirements for Streambank Stabilization include:

- Disturbed areas are kept free of foot and vehicle traffic until full stabilization occurs. (year-round)
- Site visits to ensure the plantings are healthy and sufficiently watered, manage weeds, placing sufficient mulch until the site is stabilized. (monthly)
- Site visits to make sure all areas are stabilized, and erosion of the streambank has not taken place. Any noticed streambank erosion shall be repaired immediately. (monthly)
- Site visit to inspect stabilized streambank and established plants. (biannual)
- Repair any gullies, rills, and streambank cutting, if noticed. (year-round)
- Remove weeds and invasive plant species during each growing season. (seasonal)
- Remove accumulated debris and trash. (year-round)

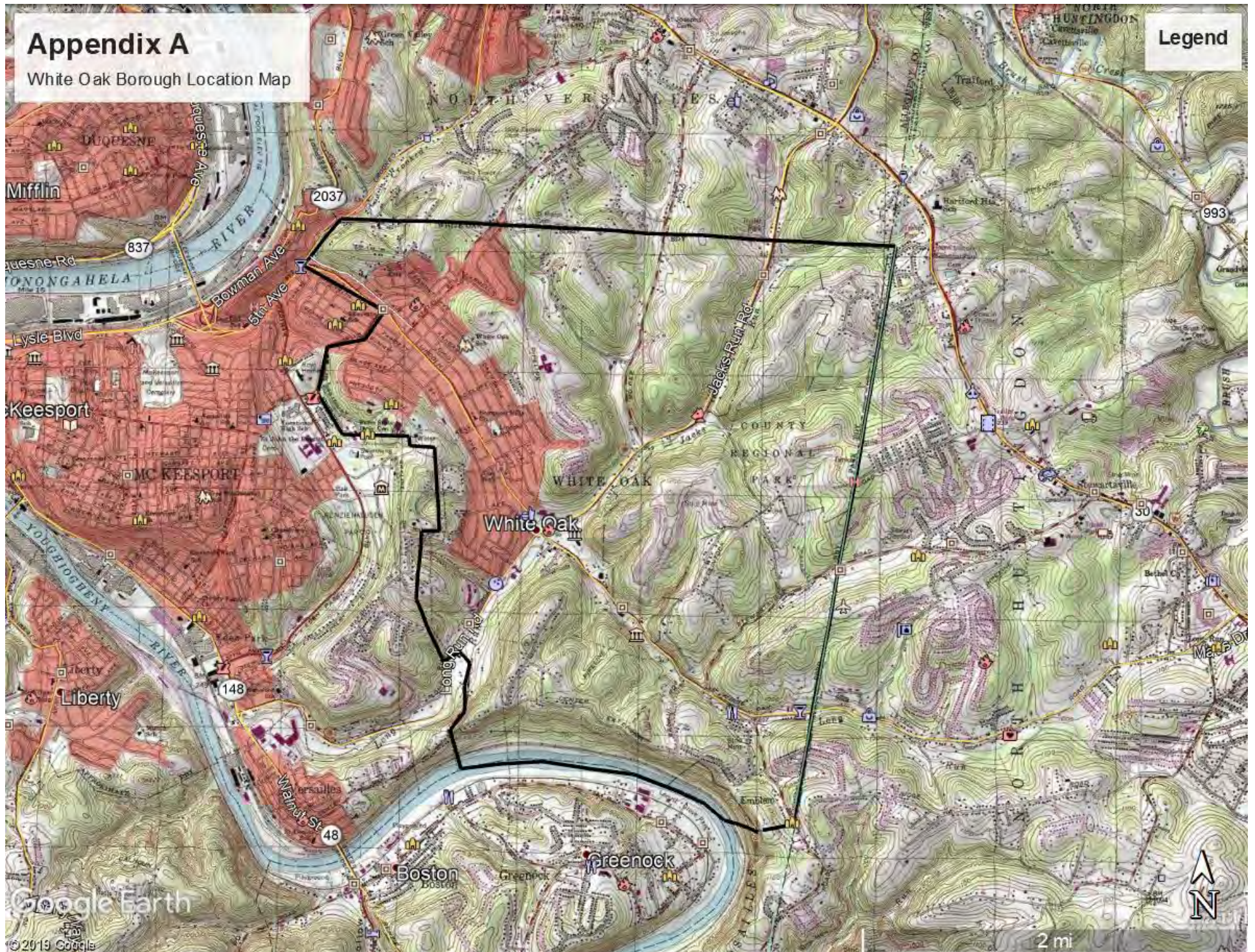
APPENDIX - A

LOCATION MAP

Appendix A

White Oak Borough Location Map

Legend



APPENDIX - B

PUBLIC PARTICIPATION
ADVERTISEMENT

PUBLIC NOTICE

The White Oak Borough Council, with the assistance of Senate Engineering Company, have prepared a Pollutant Reduction Plan (PRP) as required by the PA DEP under the MS4 Program. The goal of the PRP is to reduce sediment loading and total phosphorus flowing into streams in the Borough. The PRP proposes to install stormwater best management practices (BMPs) (i.e., streambank restoration, etc.) to reduce the loading as required. The PRP is located at the White Oak Borough Municipal building and is available for public review. Written comments will be received from the public for 45 days from the date of this notice. Comments may also be expressed during a public comment period at the Borough's upcoming February 10 and March 9, 2020 meetings.

ADVERTISE: Mon Valley Independent
February 5, 2020

AFFP

PRP Available

Affidavit of Publication

STATE OF PENNSYLVANIA } SS
COUNTY OF
WESTMORELAND }

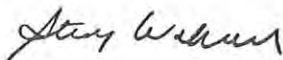
Stacy Wolford, being duly sworn, says:

That she is Managing Editor of the Mon Valley Independent, a daily newspaper of general circulation, printed and published in Monessen, Westmoreland County, Pennsylvania; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

February 05, 2020

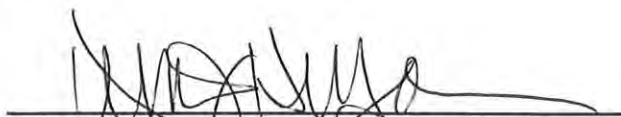
That said newspaper was regularly issued and circulated on those dates.

SIGNED:

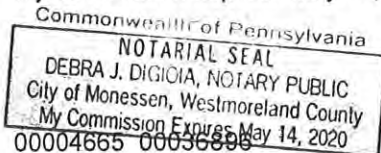


Managing Editor

Subscribed to and sworn to me this 5th day of February 2020.


Debra J. DiGioia, Notary Public, Westmoreland County, Pennsylvania

My commission expires: May 14, 2020

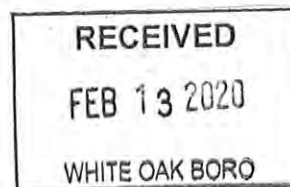
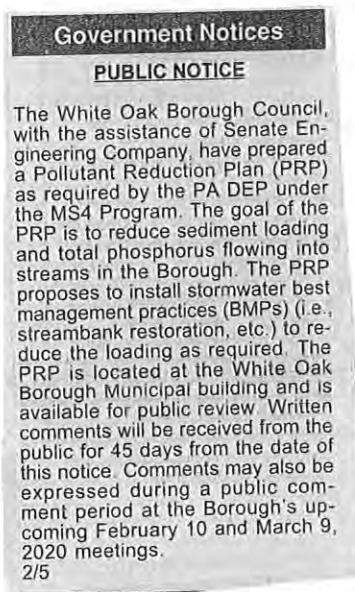


John Palyo
White Oak Borough
2280 Lincoln Way
White Oak, PA 15131

PUBLIC NOTICE

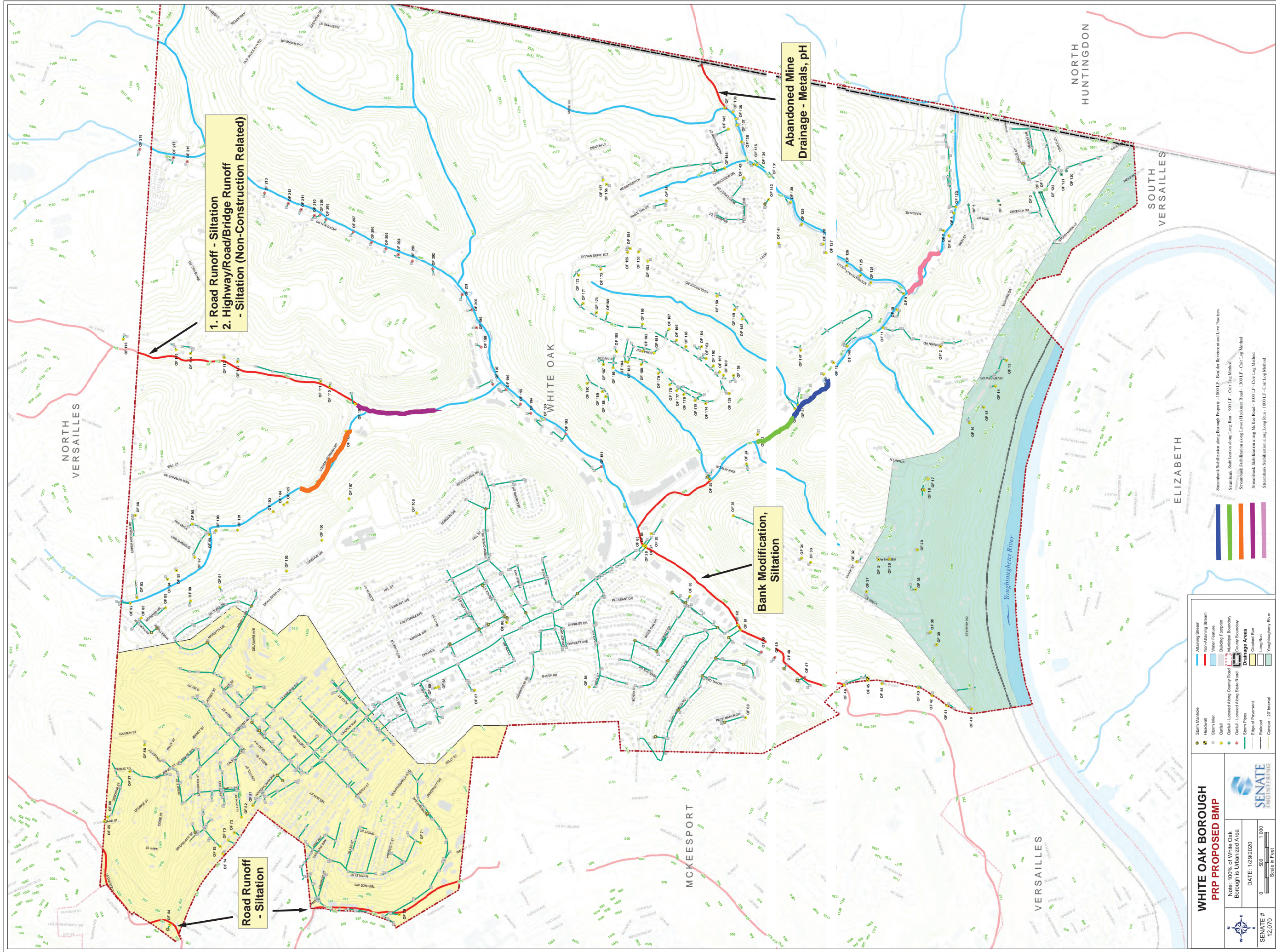
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2/5




APPENDIX - C

ZONING AND WATERSHED MAP



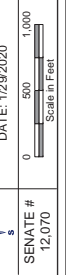
**WHITE OAK BOROUGH
PRP PROPOSED BMP**



SENATE #
12.070

Note: 100% of White Oak
Borough is Urbanized Area

DATE: 1/29/2020



Scale in Feet

- Storm Manhole
- Headwall
- Storm Inlet
- Outlet - Located Along County Road
- Outlet - Located Along State Road
- Storm Pipes
- Edge of Pavement
- Railroad
- Contour - 20' Interval
- Attaining Stream
- Non-Attaining Stream
- Water Features
- Building Footprint
- County Boundary
- County Boundary
- Drainage Areas
- Long Run
- Youghiogheny River

- Streambank Stabilization along Through Property - 1000 LF - Boulder Retention and Live Bioecies
- Streambank Stabilization along Long Run - 900 LF - Cut Log Method
- Streambank Stabilization along Lower Hickman Road - 1000 LF - Cut Log Method
- Streambank Stabilization along McKee Road - 1000 LF - Cut Log Method
- Streambank Stabilization along Long Run - 1000 LF - Cut Log Method

ZONING MAP REVISIONS:

1. McCLINTOCK ROAD, LOT BLOCK 649-P
179,229,073,241,295,367 BY ORDINANCE 3258, MAY 2002-ENACTED.
2. LONG RUN ROAD, LOT BLOCK 463-M 380 BY ORDINANCE
3229, AUGUST 2001 ENACTED.
3. ONEIL BLVD, LOT BLOCK 380-S 313 BY ORDINANCE 3267,
AUGUST 19, 2002.
4. UPDATED TO ELECTRONIC CAPABILITIES FEBRUARY 14, 2012.
DIGITAL MAPPING OBTAINED FROM ALLEGHENY COUNTY GIS SYSTEM.
ASSUMED NAD83 SOUTH ZONE.

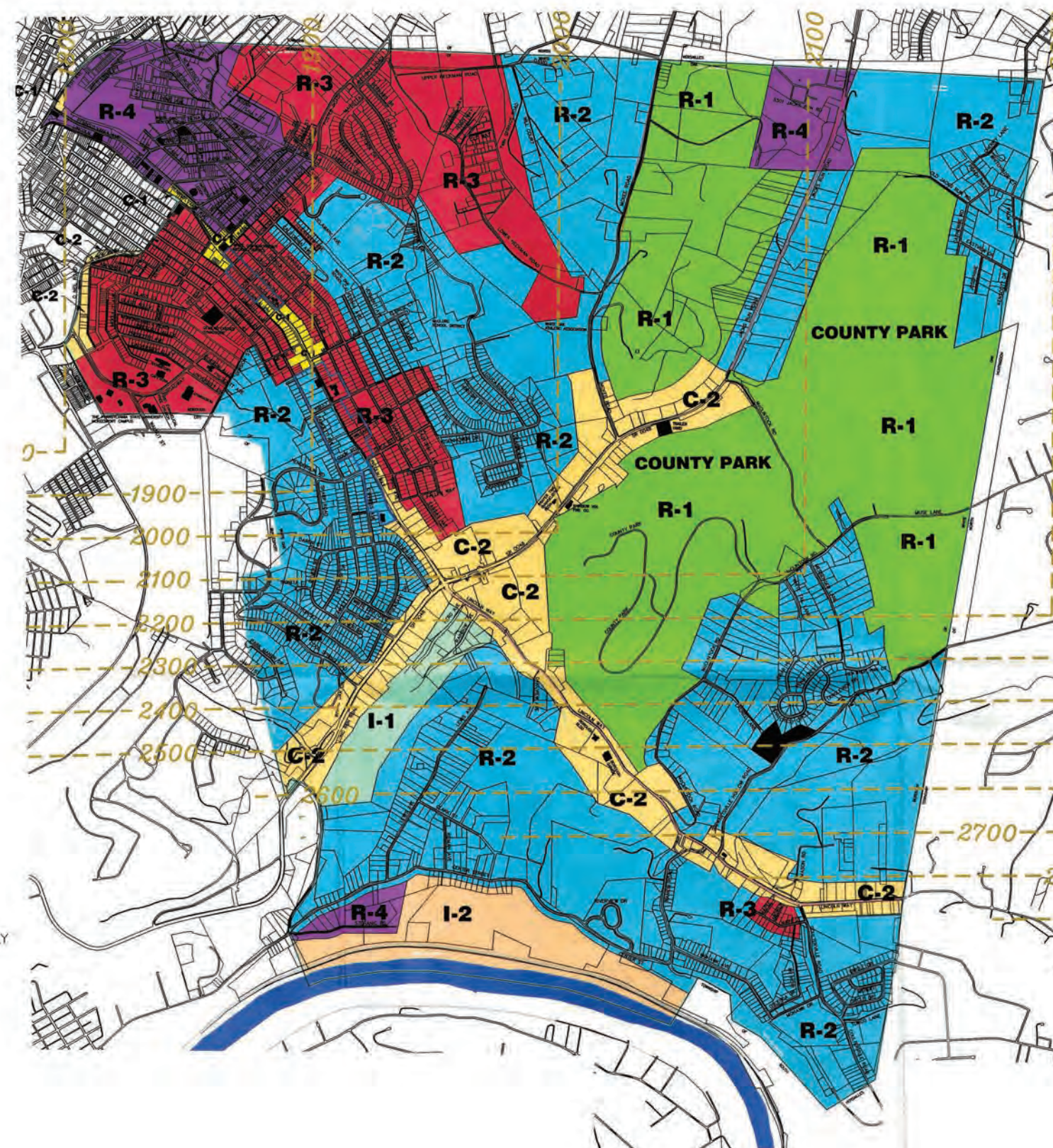
LEGEND

R-1 RESIDENCE	ONE FAMILY, LOT FRONT 90'-13,500 SQ. FT.
R-2 RESIDENCE	ONE FAMILY, LOT FRONT 60'-8,000 SQ. FT.
R-3 RESIDENCE	ONE FAMILY, LOT FRONT 50'-4,500 SQ. FT.
R-4 RESIDENCE	MIN. 4 FAMILY OR APT., LOT 35'-3,500 SQ. FT. PER FAMILY
C-1 COMMERCIAL	6,000 SQ. FT.
C-2 COMMERCIAL	15,000 SQ. FT.
I-1 LIGHT INDUSTRIAL	20,000 SQ. FT.
I-2 INDUSTRIAL	2 ACRES
NON-CONFORMING	

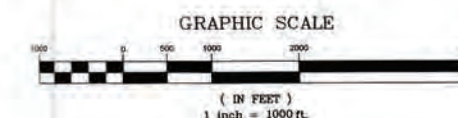
TRANSITIONAL ZONE
ZONING DISTRICT
BOUNDARIES

HEIGHT LIMITS PER
THE AIRPORT DISTRICT
OVERLAY ORDINANCE

NOTE: THE HEIGHT LIMITS (CONTOURS) SHOWN, HEREBY ESTABLISH THE APPROACH ZONE,
CONICAL SURFACE ZONE, HORIZONTAL SURFACE ZONE, PRIMARY SURFACE ZONE AND
TRANSITIONAL SURFACE ZONE PER THE AIRPORT DISTRICT OVERLAY ORDINANCE



ZONING MAP
BOROUGH OF WHITE OAK, PENNSYLVANIA
SCALE: 1" = 1000'



THE EADS GROUP
ENGINEERING ARCHITECTURE AND DESIGN SERVICES

11045 PARKER DRIVE
NORTH HUNTINGDON, PA. 15642
Phone: 412-754-0801
Fax: 412-754-0860
www.eadsgroup.com

ZONING MAP
BOROUGH OF WHITE OAK

WHITE OAK BORO, WESTMORELAND COUNTY, PENNSYLVANIA

Drawing No.
1 OF 1

Scale	Date	Drawn By	Checked By	Project No.	File No.
SCALE	2-15-2012	RDZ	DGH	12-012	9775
No.	Revisions	Date	Seal	Date	

APPENDIX - D

BASELINE LOADING CALCULATIONS

White Oak Borough Pollutant Reduction Plan

STATEWIDE MS4 LAND COVER ESTIMATES						
County	Municipality	UA% Impervious	UA% Pervious	Outside of UA% Impervious	Outside of UA% Pervious	UA Acres
Westmoreland	Allegheny Township	12%	88%	5%	95%	3894.1
Allegheny	Blawnox Borough	43%	57%	44%	56%	283.1
Allegheny	Brackenridge Borough	59%	41%	59%	41%	359.8
Allegheny	Cheswick Borough	50%	50%	44%	56%	295.8
Allegheny	East Deer Township	17%	83%	17%	83%	1601.1
Allegheny	Fawn Township	13%	87%	4%	96%	582.8
Allegheny	Franklin Park Borough	23%	77%	17%	83%	5922.8
Armstrong	Gilpin Township	33%	67%	3%	97%	132.5
Allegheny	Glassport Borough	37%	63%	37%	63%	1140.8
Allegheny	Harmar Township	30%	70%	22%	78%	2335.3
Armstrong	Kiskiminetas Township	20%	80%	2%	98%	173.0
Armstrong	Leechburg Borough	53%	47%	51%	49%	289.0
Westmoreland	Lower Burrell (City of)	19%	81%	14%	86%	4515.0
Armstrong	North Apollo Borough	29%	71%	28%	72%	369.0
Allegheny	Oakmont Borough	36%	64%	35%	65%	1097.3
Westmoreland	Oklahoma Borough	21%	79%	20%	80%	207.2
Armstrong	Parks Township	23%	77%	3%	97%	282.9
Allegheny	Reserve Township	22%	78%	22%	78%	1306.3
Armstrong	South Buffalo Township	12%	88%	3%	97%	212.3
Allegheny	South Versailles Township	9%	91%	6%	94%	316.6
Allegheny	Springdale Borough	49%	51%	44%	56%	596.5
Allegheny	Springdale Township	14%	86%	14%	86%	1527.6
Allegheny	White Oak Borough	18%	82%	18%	82%	4249.5
Westmoreland	Washington Township	10%	90%	4%	96%	2318.9

White Oak Borough Pollutant Reduction Plan

POLLUTANT LOADING RATES					
County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
Allegheny	impervious developed	-	23.06	2.28	1839
	pervious developed	-	20.72	0.84	264.96
Armstrong	impervious developed	-	23.06	2.28	1839
	pervious developed	-	20.72	0.84	264.96
Westmoreland	impervious developed	-	23.06	2.28	1839
	pervious developed	-	20.72	0.84	264.96

White Oak Borough Pollutant Reduction Plan

LONG RUN SEDIMENT LOADING CALCULATIONS

Drainage Area Information

Total Area (acres)	Acres w/in UA	Acres outside of UA
3120	3120	0

Impervious Area within Urbanized Area

Acres w/in UA	% UA Impervious From MS4 Land Cover Estimate	Impervious Developed Loading Rate	Sediment (lbs/yr)
3120	18%	1839	1,032,782

Pervious Area within Urbanized Area

Acres w/in UA	% UA Pervious From MS4 Land Cover Estimate	Pervious Developed Loading Rate	Sediment (lbs/yr)
3120	82%	264.96	677,874

Impervious Area outside of Urbanized Area

Acres w/in UA	Outside of UA % Impervious From MS4 Land Cover Estimate	Impervious Developed Loading Rate	Sediment (lbs/yr)
0	18%	1839	0

Pervious Area outside of Urbanized Area

Acres w/in UA	Outside of UA % Pervious From MS4 Land Cover Estimate	Pervious Developed Loading Rate	Sediment (lbs/yr)
0	82%	264.96	0

Total Sediment Loading (lbs/yr) 1,710,656

Required Reduction (10% of Total Sediment Loading) (lbs/yr) 171,066

Long Run Existing Loading

White Oak Borough Pollutant Reduction Plan

CROOKED RUN SEDIMENT LOADING CALCULATIONS

Drainage Area Information

Total Area (acres)	Acres w/in UA	Acres outside of UA
495	364	0

Impervious Area within Urbanized Area

Acres w/in UA	% UA Impervious From MS4 Land Cover Estimate	Impervious Developed Loading Rate	Sediment (lbs/yr)
496	18%	1839	164,186

Pervious Area within Urbanized Area

Acres w/in UA	% UA Pervious From MS4 Land Cover Estimate	Pervious Developed Loading Rate	Sediment (lbs/yr)
496	82%	264.96	107,765

Impervious Area outside of Urbanized Area

Acres w/in UA	Outside of UA % Impervious From MS4 Land Cover Estimate	Impervious Developed Loading Rate	Sediment (lbs/yr)
0	18%	1839	0

Pervious Area outside of Urbanized Area

Acres w/in UA	Outside of UA % Pervious From MS4 Land Cover Estimate	Pervious Developed Loading Rate	Sediment (lbs/yr)
0	82%	264.96	0

Total Sediment Loading (lbs/yr) 271,950

Required Reduction (10% of Total Sediment Loading) (lbs/yr) 27,195

APPENDIX - E

BMP POLLUTANT REDUCTION
CALCULATIONS

White Oak Borough Pollutant Reduction Plan

CROOKED RUN BMPs

BMP SEDIMENT REMOVAL CALCULATION - STREAMBANK STABILIZATION - LOCATION TBD			
Description	Length (ft)	BMP Effectiveness (lbs/ft/yr)	Sediment Removal (lbs/yr)
Streambank Stabilization	0.00	44.88	0.00
		Total Sediment Removed (lbs/yr)	0.00

REQUIRED REDUCTION (10% OF TOTAL SEDIMENT LOADING) (lbs/yr)	27,195
TOTAL SEDIMENT REMOVED BY PLANNED BMPS (lbs/yr)	-

White Oak Borough Pollutant Reduction Plan

BMP LOAD REDUCTION CALCULATION FOR LONG RUN AND ITS TRIBUTARIES

BMP SEDIMENT REMOVAL CALCULATION - STREAMBANK STABILIZATION - LOCATION TBD				
Description	Method	Length (ft)	BMP Effectiveness (lbs/ft/yr)	Sediment Removal (lbs/yr)
Streambank Stabilization	Boulder Revetment w/Live Fascines	900.00	13.46 *	12,114.00
Streambank Stabilization	Coir Log Streambank	4,300.00	44.88	192,984.00
Total Sediment Removed (lbs/yr)				205,098.00

REQUIRED REDUCTION (10% OF TOTAL SEDIMENT LOADING) (lbs/yr)	27,195
LONG RUN REQUIRED REDUCTION (10% OF TOTAL SEDIMENT LOADING) (lbs/yr)	171,066
TOTAL REQUIRED REDUCTION (10% OF TOTAL SEDIMENT LOADING) (lbs/yr)	198,261
 TOTAL SEDIMENT REMOVED BY PLANNED BMPS (lbs/yr)	 205,098

* Boulder Revetment is a "Creditable Method with Limits". A 30% sediment removal credit is applicable to this method.
 BMP Effectiveness = 30% x 44.88lbs/ft/yr
 BMP Effectiveness = 13.46 lbs/ft/yr

White Oak Borough Pollutant Reduction Plan

PROPOSED BMPs - INSTALLATION COSTS

ESTIMATED INSTALLATION COSTS FOR STREAMBANK STABILIZATION			
Description	Length (ft)	Costs (\$/ft)	Total Costs
Coir Log Stabilization	4,300	150	\$ 645,000.00
Boulder Revetment with Live Fascines	900	200	\$ 180,000.00
SUB-TOTAL			\$ 825,000.00
TOTAL COSTS			\$ 825,000.00

White Oak Borough Pollutant Reduction Plan

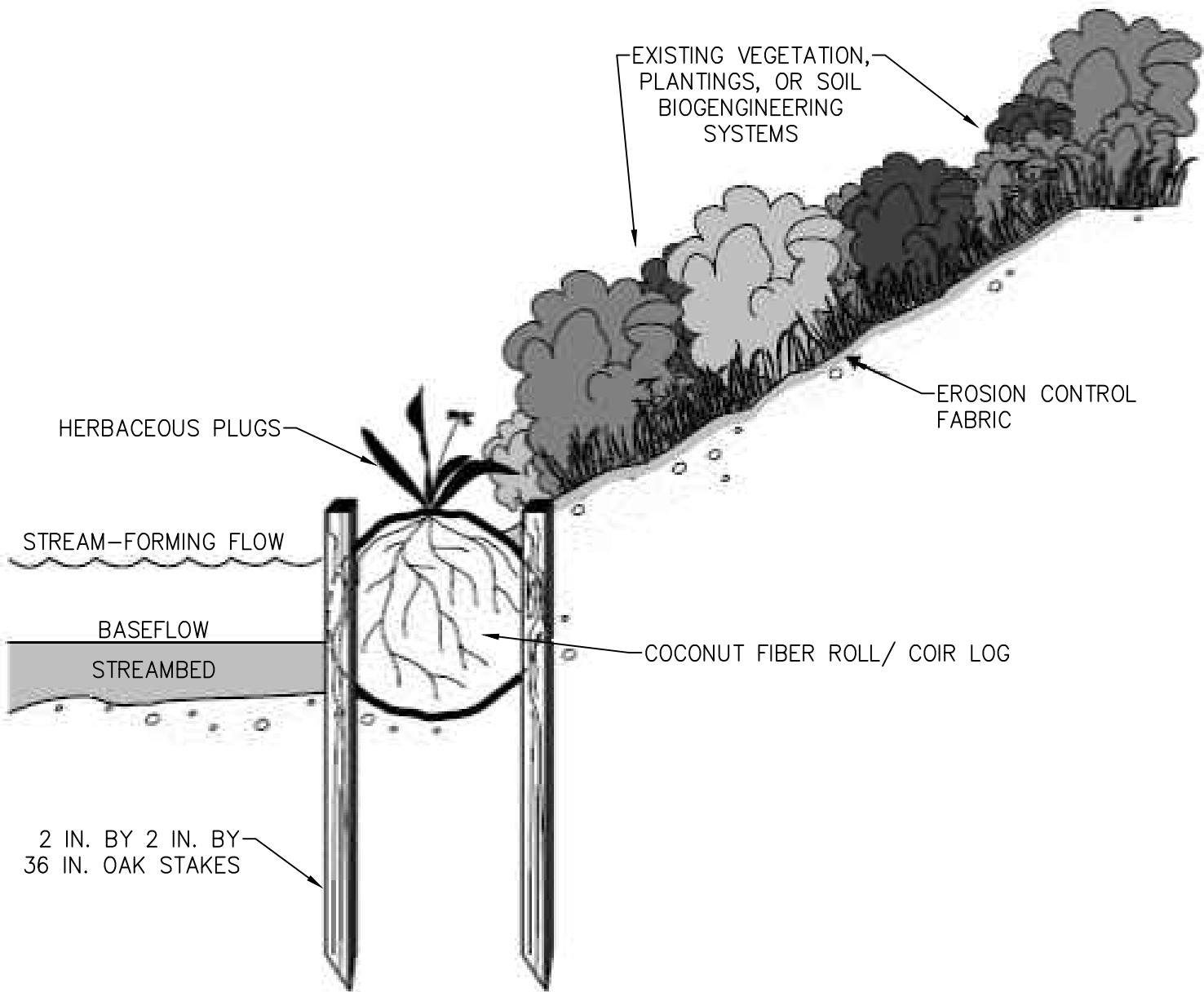
PROPOSED BMPs - MAINTENANCE COSTS

ESTIMATED MAINTENANCE COSTS FOR STREAMBANK STABILIZATION			
Description	Length (ft)	Costs (\$/ft)	Total Costs
Coir Log Streambank Stabilization	4,300	3.00	\$ 12,900.00
Boulder Revetment	900	2.50	\$ 2,250.00
SUB-TOTAL			\$ 15,150.00

TOTAL COSTS		\$ 15,150.00
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APPENDIX - F
STANDARD DETAILS

FIGURE 16-36



PART 650 - ENGINEERING FIELD HANDBOOK - CHAPTER 16 - STREAMBANK AND SHORELINE PROTECTION

COIR LOG STREAMBANK
STABILIZATION

DATE:	11/17/2021
SENATE #:	13220
SCALE:	N.T.S



SENATE
ENGINEERING

ENGINEERS-PLANNERS-SURVEYORS
U-PARC, 420 WILLIAM PITT WAY
PITTSBURGH, PA 15238
P: 412-826-5454
F: 412-826-5458
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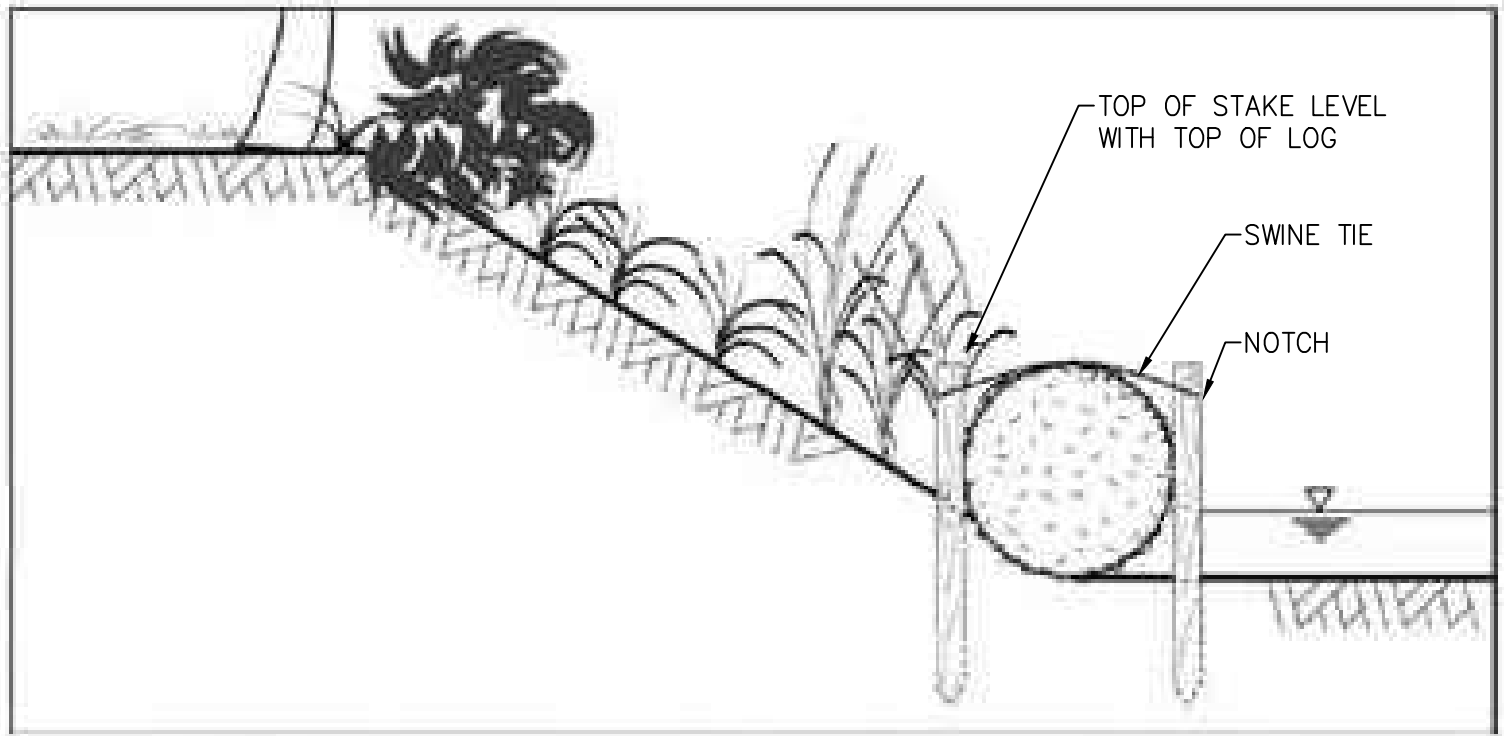


FIGURE 1 - TYPICAL PLACEMENT OF GEO LOG AT TOE OF STREAM BANK

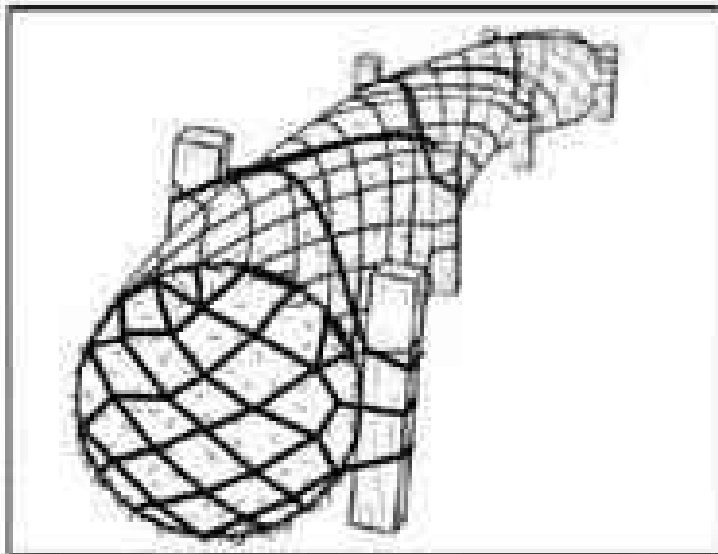


FIGURE 2 - TYPICAL ANCHORAGE OF GEO LOG

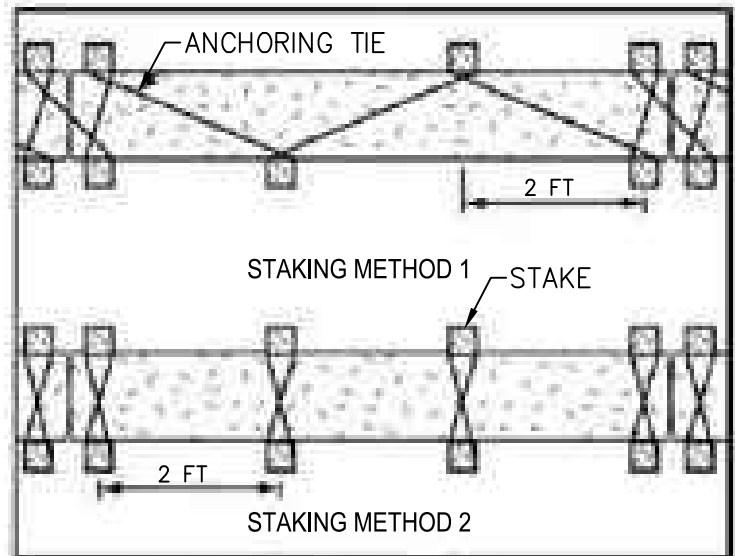


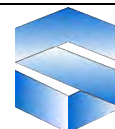
FIGURE 3 - VARIOUS METHODS OF STAKE PLACEMENT

COCONUT FIBER ROLL
INSTALLATION DETAILS

DATE: 11/17/2021

SENATE #: 13220

SCALE: N.T.S



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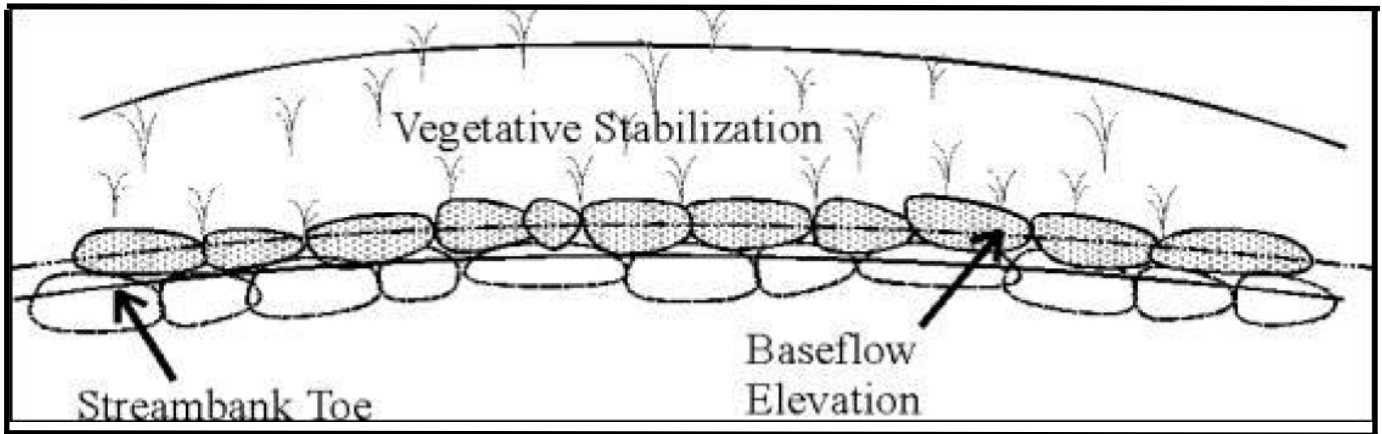
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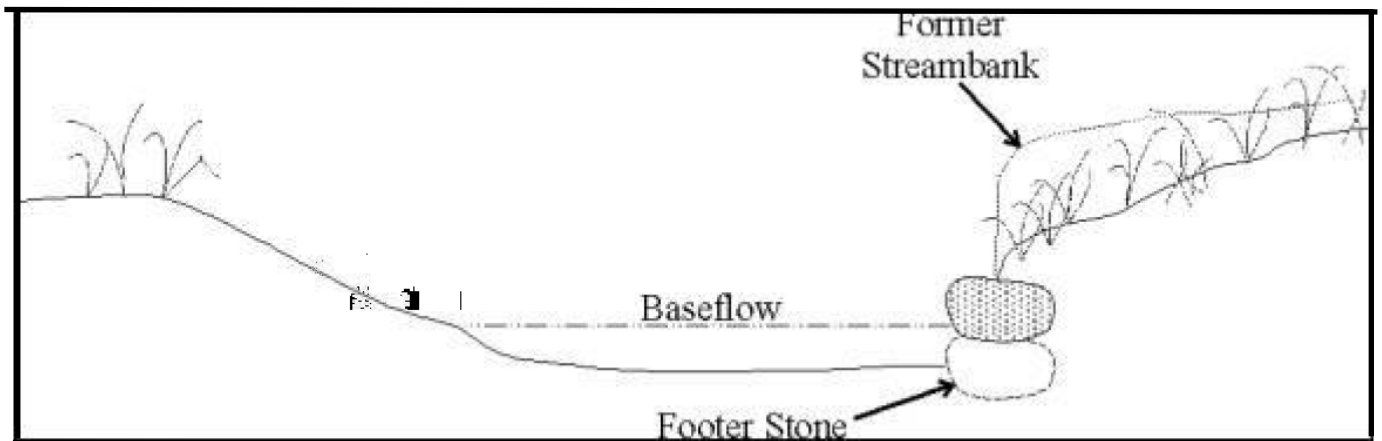
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SECTION VIEW OF THE SINGLE BOULDER REVETMENT



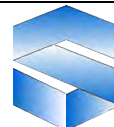
PROFILE VIEW OF THE SINGLE BOULDER REVETMENT

BOULDER REVETMENT

DATE: 11/17/2021

SENATE #: 13220

SCALE: N.T.S



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APPENDIX - G

DEP STREAM RESTORATION
ELIGIBILITY CRITERIA

The stream restoration projects must meet the qualifying criteria to be eligible for MS4 reduction credits. The project which get qualify for the MS4 reduction credit must meet the siting and restoration technique requirements.

The text following the bold statements explains how the proposed project meets DEP's MS4 credit reduction criteria.

1. Siting

A. Permittee must document existing channel or streambank erosion and an actively Enlarging or incising urban stream condition prior to restoration.

Active bank erosion and stream erosion are evidenced in the photographs of the Long Run, UNT of Jack's Run and a Lower Heckman Road run. These pictures are included in the attachment A.

B. Effectiveness is most readily demonstrated for projects in 1st-3rd order streams.

Long Run is a 2nd Order Stream

UNT of Jack's Run is 1st Order Stream

Lower Heckman Road Run is a 1st Order Stream.

C. The project must address at least 100 linear feet of stream channel

5,200 LF of eroded and incised streambanks will be stabilized using bio-engineering methods like Coir Log streambank stabilization and Boulder Revetment with live fascines.

D. Impervious area upstream of the project must be sufficiently treated to address peak flows that may exceed engineering design thresholds or compromise channel form and function

The areas upstream of the Long Run, Lower Heckman Road Run and UNT of Jack's Run are developed prior to the current stormwater regulations. All new developments must have to follow the current stormwater regulations and will therefore control the peak flow.

Rock Vanes, Cross Vanes, and step pools will be installed upstream of the areas where bio-engineering methods are used to stabilize the streambanks.

- E. The project must address both sides of the channel on sites where a need to so is evident.**

Streambank stabilization will be conducted on both sides.

2. Techniques:

- A. The goal is to apply a comprehensive approach that may employ mix of techniques appropriate to the site, creating long-term stability of the streambed, streambanks and floodplain.**

The total project takes a comprehensive approach and integrates the bio-engineering methods like coir log stream stabilization with cross vanes and step pools to provide long term stability to the stream banks.

- B. Streambank or streambed armoring may be used where necessary to maintain channel stability, but the length of the stream that is armored(such as with riprap and gabions)may not be included in the load reduction calculation.**

Streambank armoring with Riprap and/or gabions is not proposed.

- C. Projects should maximize floodplain reconnection, with a minimal channel invert elevation increase required to achieve this objective. Restoration bank height ratios must be 1.0 or less.**

During the installation of the coir logs and boulder revetment, streambanks will be cut back to slope 1V:3H or 1V:2H.

- D. A permanent 35' minimum buffer.**

In feasible areas a permanent 35-ft buffer will be provided.

ATTACHMENT- A

LONG RUN STREAM EROSION AND STREAM INCISING PICTURES





































LOWER HECKMAN ROAD RUN AND MCKEE ROAD RUN
STREAMBANK EROSION AND STREAM INCISING PICTURES





















