Trainer Borough
Pollutant Reduction Plan

Prepared for:
Trainer Borough
824 Main Street
Trainer, PA 19061

Prepared by:
Stantec Consulting Services
1060 Andrew Drive Suite 140
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August 7, 2017

Last Revised February 6, 2019

February 6, 2019

Table of Contents

LIST OF ATTACHMENTS

February 6, 2019

1.0 INTRODUCTION

This Pollutant Reduction Plan was prepared for the Borough of Trainer, Delaware County, PA. The Borough is situated on the northwest bank of the Delaware River and is bordered by the City of Chester to the east, the Borough of Marcus Hook to the southwest and Upper and Lower Chichester Townships to the north and west respectively. The Borough contains portions of the Delaware River, Marcus Hook and Stoney Creek watersheds. The Borough has developed as a highly-industrialized community with a population of 1,828 residents according to the 2010 Census. The majority of the development of both the industry and housing stock occurred prior to the implementation of stormwater management. The Borough has somewhat limited open spaces and opportunities for improvements to water quality. Their location on the Delaware River also lends itself to "accepting" uncontrolled runoff from all of the upstream communities in both of the watersheds. The Census Bureau has classified the Borough as low to moderate income for the entire community. The Borough has been a Municipal Separate Storm Sewer System (MS4) permittee since 2003 and continues to make every possible effort to comply with permit requirements, although financially burdened with ever rising police, emergency services, pension and insurance costs.

2.0 PUBLIC PARTICIPATION

The Borough advertised a public hearing to review the Pollution Reduction Plan and solicit public comment in My Spirit News on July 26th and August 2nd for 7:00 pm on August 10, 2017. Following presentation of the plan, it was made available at the Borough offices and on their website and public comments regarding the plan were encouraged to be submitted through September 8, 2017. Other than discussion at the public hearing requesting clarifications to the areas which were parsed from the Borough's responsibility and how the work needed to implement the plan would be funded, there were no additional public comments submitted.

3.0 MAP

The Borough has continued to update the mapping of their storm sewer collection system. Attached to the report is Figure 1, NPDES Storm Sewershed Map. The map depicts the location of the Stormwater Best Management Practices installed throughout the Borough, the storm sewer inlets, pipes, and outfalls. 2015 aerial imagery has been used for the map to depict the impervious coverage within the Borough. As the Borough is located within a single Hydrologic Unit Code(HUC)-12 level watershed, Repaupo Creek-Delaware River (020402040607), the boundary has not been shown on the map.

Drainage areas for each storm sewer outfall are shown on Figure 1. The drainage areas were created using 2-foot contour data provided by Delaware Valley Regional Planning Commission (DVRPC) and determining the drainage area for each inlet using Autodesk Civil 3D 2017. The drainage areas were then reviewed. In areas where the data did not provide clear drainage patterns, the sewersheds were manipulated by hand, based on overall drainage patterns from USGS 10-foot contour data. The total outfall drainage area for the Borough is 4,972,512 square feet. The remaining portions of the Borough's MS4 area (10,287,780 square feet) drain to streams by entering PennDOT drainage systems, or by overland flow.

The Borough area was also reviewed to determine areas to be parsed from the MS4. As defined by the PADEP PRP Instructions (3800-PM-BCW0100k), Attachment A "Parsing Guidelines for MS4s in Pollutant Reduction Plans", parsing is "a process in which land area is removed from a storm sewershed in order to calculate the actual or target pollutant loads that are applicable to an MS4." Areas which can be removed include those which do not drain to the MS4 and areas covered by an NPDES permit such as PAG-03 General Permit for Stormwater Associated with Industrial Activity. These include areas associated with PennDOT roads and rights-of-way. PennDOT rights-of-way within the Borough which have been parsed include the rights-of-way for Laughead Avenue / Township Line Road (S.R. 3008), Ridge Road / 9th Street (S.R. 3006), Post Road (S.R. 0013), and Price Street / Second Street (S.R. 0291). A total of 871,978 square feet of PennDOT roads and rights-of-way have been parsed. Industrial properties with separate NPDES Permits which have been parsed are Congoleum Industries, Monroe Energy, Lou's Auto Service, and International Scrap Iron & Metal Company. A total of 13,428,540 square feet of non-municipal stormwater/Industrial properties with NPDES permits have been parsed. According to PADEP eFacts, Stoney Creek Technology also has a PAG-03 permit but has not been parsed from the Borough MS4 area due to the PADEP cleanup efforts. Additionally, the Borough boundary extends to Pennsylvania state line with New Jersey in the Delaware River. 11,568,835 square feet of the water body area of the Delaware River has been parsed.

4.0 POLLUTANTS OF CONCERN

Runoff from the Borough of Trainer goes to the Delaware River and two of its tributaries, Marcus Hook Creek and Stoney Creek. All 3 watercourses are impaired according to the 2014 Impaired Rivers survey. The impairments for Marcus Hook Creek include metals from land disposal and unknown sources; water/flow variability from Urban Runoff/Storm sewers; siltation from urban runoff/storm sewers; unknown causes from urban runoff/storm sewers; and habitat modification impairments from habitat modifications. Stoney Creek has impairments from water/flow variability from urban runoff/storm sewers; siltation from urban runoff/storm sewers; unknown causes from urban runoff/storm sewers; and habitat modification impairments from habitat

modification. The segment of the Delaware River is impaired by unknown sources of PCBs in addition to the impairments for Marcus Hook Creek and Stoney Creek.

DEP prepared a table identifying the Municipal MS4 pollutants of concern for each municipality and watershed. The Delaware River is impaired by Appendix C – PCB (4a). Marcus Hook Creek and Stoney Creek are impaired by Appendix E – Siltation (5).

To address the Appendix C pollutant, PCBs, pollutant control measures must be implemented. This report is not meant to address these measures at this time. The pollutant of concern for this report is the Appendix E - Siltation.

5.0 EXISTING POLLUTANT LOADING

To determine the existing loading for the siltation, the PADEP Simplified Method was used. According to PADEP PRP Instructions Attachment B, pollutant loadings for the Borough would fall under the "All Other Counties" section. The table below summarizes the loading from the PADEP document.

Table 1 – PRP Pollutant Loading Rates

Category	Total Nitrogen lbs/acre/yr	Total Phosphorus lbs/acre/yr	Total Suspended Solids lbs/acre/yr
Impervious Developed	23.06	2.28	1839
Pervious Developed	20.72	.84	264.96
Undeveloped	10	.33	234.6

For total suspended solids (TSS) / sediment, impervious developed areas have a loading of 1839 pounds per acre per year, and pervious developed areas have a loading of 264.96 pounds per acre per year. Undeveloped land properties have a loading rate of 234.6 pounds per acre per year.

According to the United States Census Bureau, the Borough area is 1.374 square miles. Using the 2017 PennDOT Municipal Boundary dataset and projected in Pennsylvania State Plane South 1983 coordinates, the Borough area was calculated as 1.475 square miles. The 1.475 square miles, or 41,129,645 square feet, was used as the starting point for the pollutant loading calculations.

The Borough MS4 area was calculated by subtracting the parsed area from the total area. This resulted in a total of 15,260,292 square feet in the Borough MS4 area. The sediment loadings for the Borough are not broken down between loadings to the Marcus Hook Creek, Stoney Creek, and Delaware River as they are all within the same HUC12 watershed. Detailed calculations are attached at the end of this report.

February 6, 2019

The land use within the Borough was analyzed using a combination of sources. Undeveloped land was determined using a Delaware County Assessor Office description data and then verified using the 2015 aerial imagery and knowledge of any development within the Borough since then. Undeveloped area includes Borough owned property and parks with very limited impervious area such as Henry Johnson Park and not parks such as the playground at 13th and Anderson Streets, or the parcel the Borough Hall is located. Privately owned undeveloped properties include PECO owned right-of-way properties, "Deer Run Associates", AAA Group, Sucram Associates, and James Hinchliffe. The total undeveloped land within the Borough was calculated as 4,650,463 square feet.

To calculate the developed area impervious and pervious areas, the Borough zoning map and Delaware County parcel information was used. Each zoning district was individually analyzed. Within the Borough's public road rights-of-way, the entire area was assumed as impervious even though grass is located within this area in most of the Borough for front yards or between sidewalk and curb. The Borough owned road area was calculated by taking the Zoning District area and subtracting the parsed area and tax parcel within that Zoning District. No area of municipally owned roadways was parsed from the MS4 permit area. The parsed, road, and undeveloped land areas were subtracted from the Zoning District area to determine the developed areas. Impervious surface coverage as a percentage of the overall area were taken from National Resource Conservation Service Technical Release 20 (NRCS-TR20). For residential lots, less than ¼ acre in size, the impervious coverage is 40 percent. Commercial/business zoned properties the impervious coverage is 85%, and industrial is assumed at 72%. Amtrak and Consolidated Rail rights-of-way have assumed impervious coverage of 72% to be consistent with the industrial zoning district they are located in.

There are several privately owned best management practices installed in the Borough. No reduction in the loading for the drainage areas to these BMPs was included in the sediment loading calculations.

Table 2 below provides the breakdown for the Borough land use coverage and sediment loading.

Table 2 – Land Coverage and Sediment Loading

Description	Area (Square Feet)	Area (acres)	TSS (lb/yr)
Undeveloped	4,650,463	106.76	25,046
Impervious Developed	6,885,456	158.07	290,688
Pervious Developed	3,724,373	85.50	22,654
Borough MS4 Area	15,260,292	350.33	338,388
Parsed	25,869,353	593.88	
Total Borough Area	41,129,645	944.21	

The total annual sediment loading for the Borough's MS4 area is 338,388 pounds. To meet the required 10% reduction, the Borough needs to implement best management practices to reduce 33,838.8 pounds per year.

6.0 BEST MANAGEMENT PRACTICES TO MEET REQUIRED POLLUTANT REDUCTION

To reduce the sediment loading from the Borough by 33,838.8 pounds, best management practices need to be installed. PADEP prepared a document detailing the BMP Effectiveness Values for Stormwater Discharges from Small MS4s (3800-PM-BCW0100m). According to the BMP effectiveness table, stream restoration would result in a reduction of 44.88 pounds per foot restored per year. To meet the reduction goal, 755 linear feet would need to be restored.

The Borough is proposing to perform stream restoration to the Marcus Hook Creek within Henry Johnson Park to meet the reduction as shown in Figure 3, NPDES PRP Project Map. This location meets the PADEP Stream Restoration guidance. The Marcus Hook Creek has been identified as an impaired water under for Appendix E – Siltation. According to the PADEP EMAP, this section of the creek is a 2nd order stream. As the Marcus Hook Creek discharges to the Delaware River along the border of Trainer Borough with Marcus Hook Borough, the effects of siltation to change the channel bottom and flow variations to erode the stream banks is most exacerbated within this final mile of the stream. By performing a combination of legacy siltation removal from the creek bed, restoration of stream banks to natural conditions, and establishment of riparian buffers, the project would meet theses goals. The specifics regarding the design, sediment removal, stream bank restoration and plantings needs to be further investigated. The PADEP guidance also states, "the impervious areas 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 area adjacent to the creek at the project location is park area with minimal impervious area. The 3,500 linear feet upstream of the project area goes through the

Read Boyd Farm property in Upper Chichester Township and has minimal impervious areas which would directly affect the channel in the project area. At an estimated cost of $150 per linear foot, the project has a preliminary cost of $113,250. This does not include design, permitting, or contingencies. This would require the Borough to budget or obtain grant funding for that amount within the 5-year permit period.

The Borough owns the land adjacent to the creek at the start of the park and holds a long-term lease with PECO for the remaining portions of the creek contained within the Park. This will minimize the land acquisition cost and time required to acquire easements for the work while allowing the stream restoration project to address both sides of the channel. This provides the most cost effective method for the Borough to meet the goals of the program.

7.0 FUNDING MECHANISMS

As a small municipality with limited tax base and resources, the Borough may not have the ability to finance the project directly. With increasing costs for essential public emergency services provided by the Borough police and fire company, the limited resources will be further strained. The Borough is committed to funding the implementation and maintenance of the proposed PRP project. The Borough is in the process of determining funding mechanisms to achieve the permit requirements.

8.0 OPERATION AND MAINTENANCE RESPONSIBLE PARTIES

The Borough would be responsible for the operation and maintenance of the stream restoration. The Pennsylvania Stormwater BMP Manual contains information on the operation and maintenance for Riparian Buffer Restoration and Floodplain Restoration. Routine maintenance of the riparian buffer vegetation includes watering during the establishment period of new plantings, mulching around the tree trunk areas, control of weeds and invasive plants, and protection from deer damage through plant selection, repellents and tree shelters. Inspection and monitoring of the riparian buffer should be done at least four times a year for the first four years to ensure at least 70% of the riparian buffer survives. In areas where floodplain restoration is done with native plants and grasses, maintenance includes weed and invasive plant control during the establishment period of four years, mowing grasses to between eight and twelve inches twice a growing season and providing geotextile weed mats. These maintenance items would be performed by the Borough. In the event of serious issues such as erosion from a catastrophic storm, the Borough would look to engage an experienced contractor to perform the work.

Title:	Loading Calculations	Revised By:	GKK
Project #:	176710033	Date:	2/6/2019
Prepared By:	GKK	Checked By:	
Date:	8/3/2017	Date:	

TRAINER BOROUGH NPDES PRP SEDIMENT LOADING CALCULATIONS

Official Borough Area =	1.374	sq mi
Borough Area Per PennDOT Municipalities Boundary =	41,129,645	sq ft
or	1.475	sq mi

Note: All calculated areas are based on areas derived from GIS data sets projected in Pennsylvania State Plane South, US Survey Foot.

Parsed Areas	**Total**	**25,869,353**	**sf**
	PennDOT Roads and Right-of-Ways	871,978	sf
	Water	11,568,835	sf
	Industrial Areas with Individual NPDES Permits		
	Monroe Energy Refinery	10,763,962	sf
	Congoleum	2,063,025	sf
	Lou's Auto Service	448,575	sf
	International Scrap Iron& Metal	152,978	sf
	Borough MS4 Area	**15,260,292**	**sf**
Undeveloped	**Total**	**4,650,463**	**sf**
	Borough Park	2,774,208	sf
	Private Open Space/Undeveloped	1,876,255	sf
Impervious Developed	**Total**	**6,885,456**	**sf**
	Municipal Road Area:	1,432,840	sf
	Residential	1,530,578	sf
	Commercial	455,381	sf
	Industrial	3,466,657	sf
Pervious Developed	**Total**	**3,724,373**	**sf**
	Municipal Road Area:	0	sf
	Residential	2,295,867	sf
	Commercial	80,361	sf
	Industrial	1,348,145	sf

Note:
Borough MS4 Area = Borough Area - Parsed Area
Municipal Road Area = (Zoning Area - Parsed Area - Parcel Area)
Impervious Area = (Zoning Area - Parsed Area - Road - Undeveloped Land) * Impervious Coverage per Zoning Area.
Pervious Area = (Zoning Area - Parsed Area - Road - Undeveloped Land) *(1 - Impervious Coverage per Zoning Area)

Residential Assumed 40% Impervious, Commercial Assumed 85% Impervious, Industrial Assumed 72% Impervious per NRCS TR-20

TRAINER BOROUGH NPDES PRP SEDIMENT LOADING CALCULATIONS

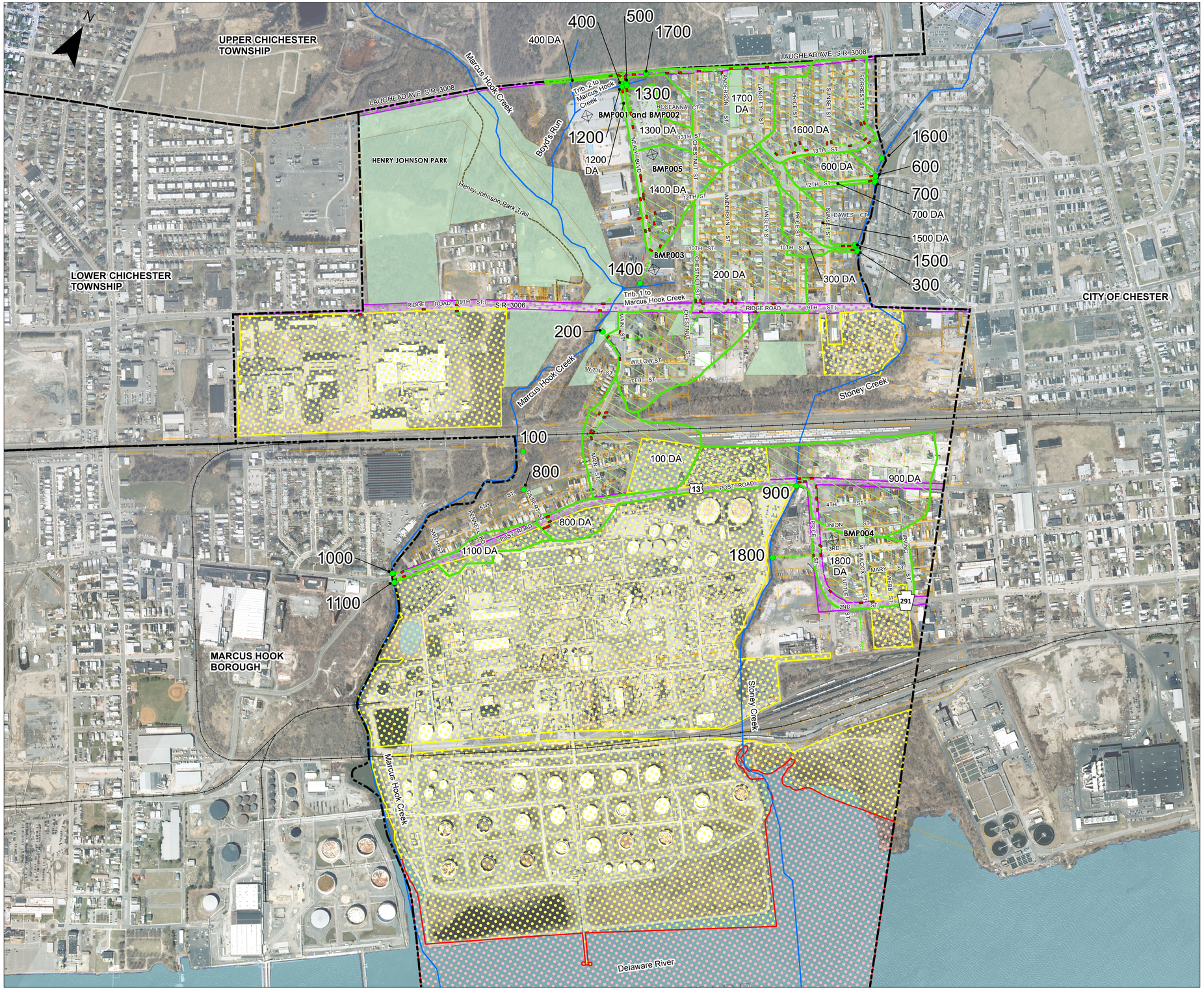
Land Cover	Area		TN		TP		TSS	
	(sf)	(ac)	#/ac/yr	lb/yr	#/ac/yr	lb/yr	#/ac/yr	lb/yr
Undeveloped Area	4,650,463	106.76	10	1,067.6	0.33	35.23	234.6	25,046
Impervious Developed	6,885,456	158.07	23.06	3,645.1	2.28	360.40	1839	290,688
Pervious Developed	3,724,373	85.50	20.72	1,771.6	0.84	71.82	265	22,654
Total	**15,260,292**	**350.33**		**6,484**		**467**		**338,388**

Pollutants of Concern for Marcus Hook Creek, Stoney Creek, and Delaware River: **Metals, Siltation, PCBs**

Required 10% Reduction due to Siltation: 33,838.8 lb/year TSS

BMP to Reduce Siltation

BMP Name	BMP Effectiveness			BMP Area	Pollutant Removal
	TN	TP	Sediment		
Stream Restoration	0.075 lb/ft/yr	0.068 lb/ft/yr	44.88 lb/ft/yr	755 lf	33,884 lb/yr
Total TSS Reduction					**33,884**



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Legend

- Outfall
- Storm Pipes
- Basins
- Rail
- Tax Parcel
- Public Park / Borough Owned Property
- 1000 DA — Outfall Drainage Area
- Non-Municipal/Industrial Stormwater NPDES Parsed Area
- PennDOT Right-of-Way Parsed Area
- Non-MS4 Drainage Area Parsed Area
- Stream
- Municipal Boundary
- Storm Manhole
- Storm Inlet
- BMP

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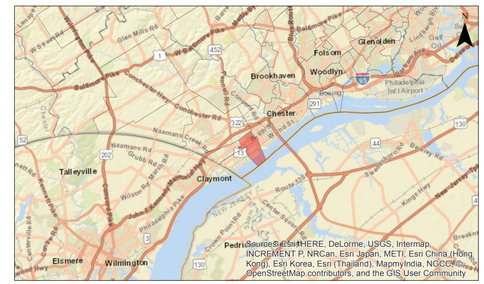
Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet



Prepared by GKK on 2017-08-07
Last Revised by GKK on 2019-02-06

Client/Project

Trainer Borough
Delaware County, PA

Figure No.

1

Title

NPDES STORM SEWERSHED MAP

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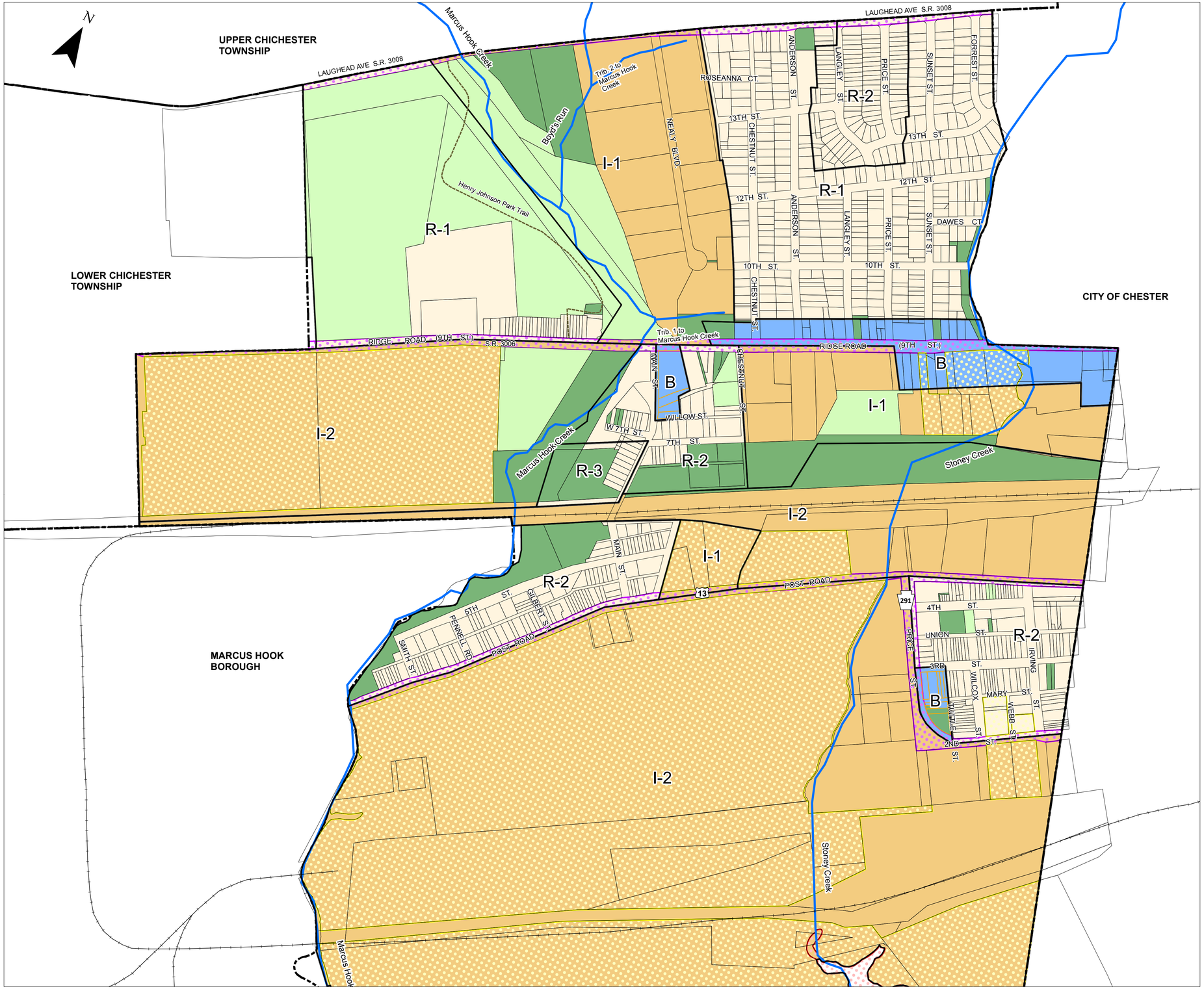

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Legend

Undeveloped Land

- Borough
- Private

Land Use / Zoning

- Commercial
- Industrial
- Residential
- Trail
- Rail
- Tax Parcel
- Non-Municipal/Industrial Stormwater NPDES Parsed Area
- PennDOT Right-of-Way Parsed Area
- Non-MS4 Drainage Area Parsed Area
- Stream
- Municipal Boundary

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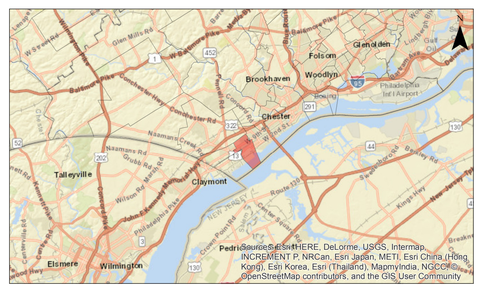
Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet



Prepared by GKK on 2017-07-14
Prepared by GKK on 2019-02-06

Client/Project

Trainer Borough
Delaware County, PA

Figure No.

2

Title

NPDES LAND COVER MAP

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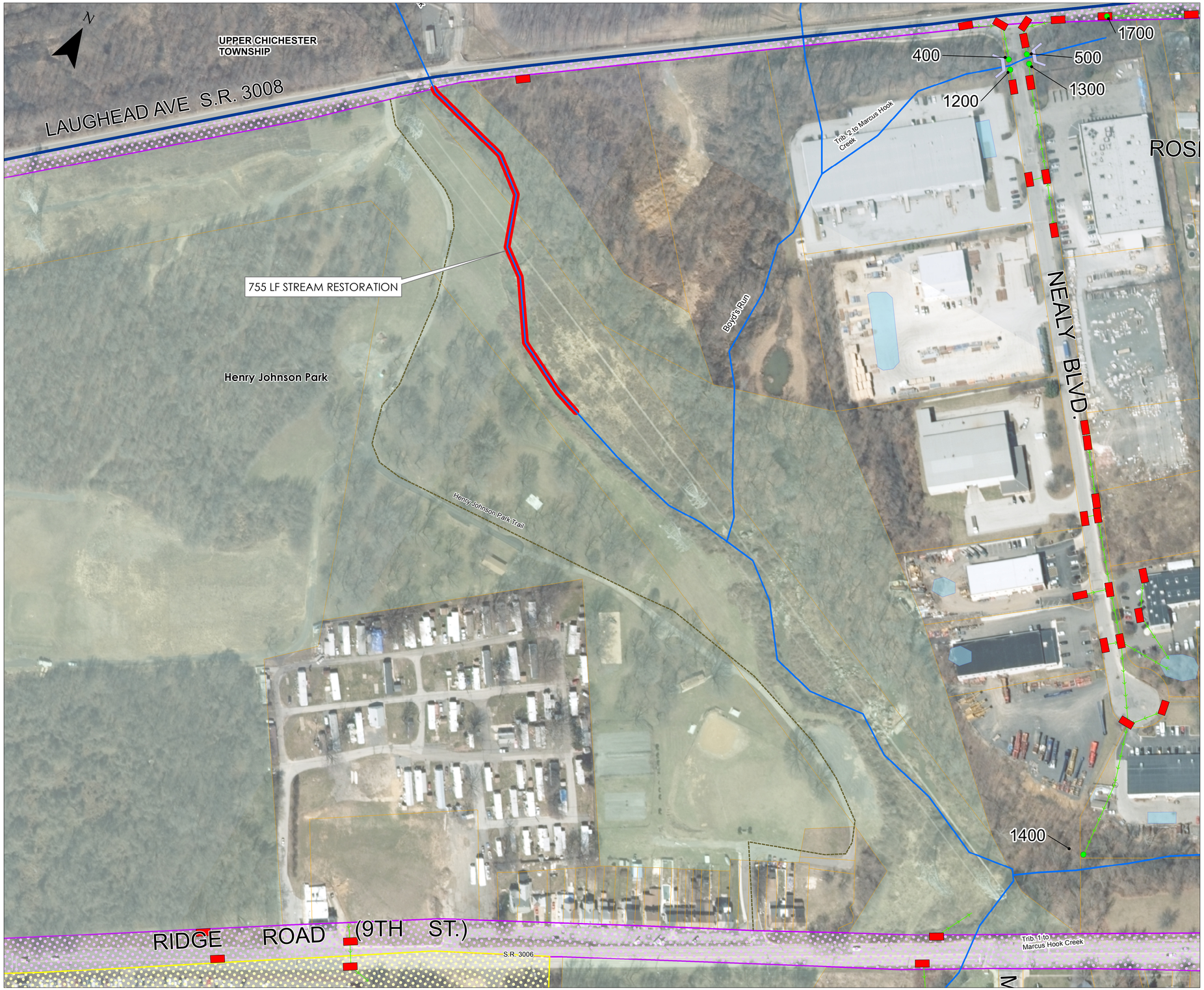

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Legend

- PRP Project Location
- Outfall
- Storm Pipes
- Basins
- Rail
- Tax Parcel
- Public Park
- Non-Municipal/Industrial Stormwater NPDES Parsed Area
- PennDOT Right-of-Way Parsed Area
- Stream
- Municipal Boundary
- Storm Manhole
- Storm Inlet

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Notes

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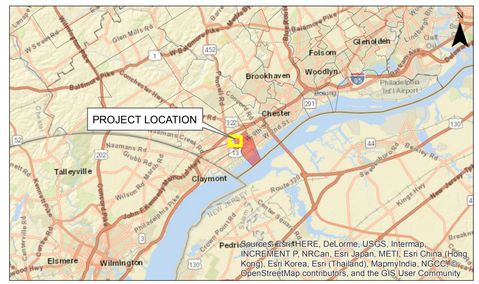

Project Location

Prepared by GKK on 2017-08-07
Last Revised by GKK on 2019-02-06

Client/Project

Trainer Borough
Delaware County, PA

Figure No.

3

Title

NPDES PRP PROJECT MAP

G:\pa\delco\g_trainer\mxd\trainer prp project 2019.mxd Revised: 2019-01-31 By: gkokra