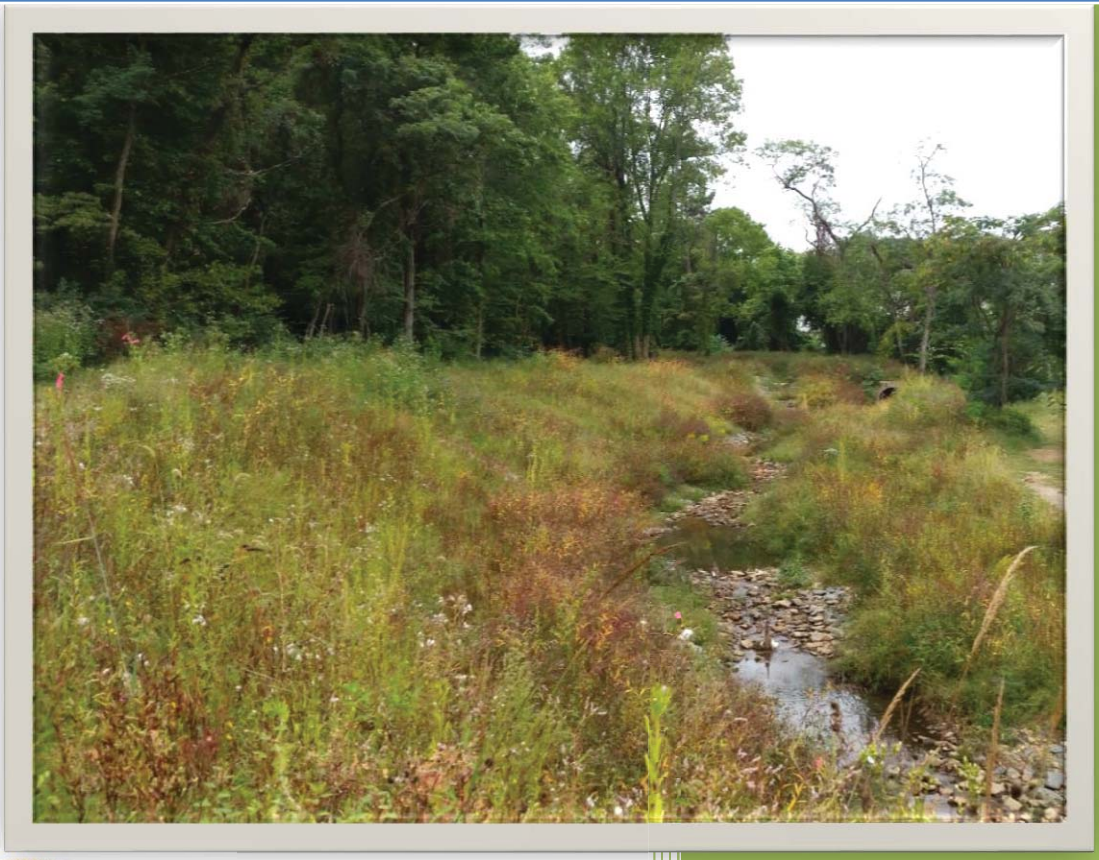
October 2017

Annual Stormwater Management Report
VSMP Permit No. 0088595 – FY 2017



Submitted by:
Prince William County
Department of Public Works

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Appendices

Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Marc Aveni

September 29th, 2017

Marc Aveni

Date

Chief, Environmental Services Division

Cover Photo: Hylbrook Park Stream Restoration

I. Program Implementation

1. MS-4 Program Review and Updates

The Prince William County MS-4 Program plan describes all programs and actions taken by the County to ensure compliance with Virginia Stormwater Management Program (VSMP) MS-4 Permit # VA0088595. Prince William County was issued its latest permit on December 17th, 2014. Prince William County submitted its program plan document to the DEQ Northern Virginia Regional Office (NVRO) on December 17th, 2015 as required in section I.a.6 of its MS-4 Permit. Any changes from the program plan will be reflected in this document.

2. Planning

On December 17th 2015 the County submitted to the Department a cost benefit analysis of pollutant reduction priority projects as part of its Program Plan. These projects are selected from completed watershed studies and are prioritized according to a number of metrics determined by County.

In addition to its cost benefit analysis, the County submitted its Watershed Management plan as part of its Program plan and is posted on the County's website.

3. MS4 Program Implementation

a. Construction Site Runoff and Post Construction Runoff

BMP 1 – Continue to implement an Erosion and Sediment Control Program

Prince William County continues to implement the erosion and sediment control program consistent with the Virginia Erosion and Sediment Control Law §62.1-44.15:51 of the Code of Virginia and Virginia Erosion and Sediment Control Regulations 9VAC25-840 et seq. Our E&S regulations are not more stringent than the State regulations. E&S permit is required when the land disturbance exceeds 2,500 square feet.

Our stormwater management program is consistent with the Virginia Stormwater Management Act §62.1-44.15:24 of the Code of Virginia and Virginia Stormwater Management Program Regulations 9VAC25-870 et seq. The Virginia Stormwater Management Program (VSMP) regulations became effective on July 1, 2014. These regulations are contained in Section 700 of the County's Design & Construction Standards Manual (DCSM), and Chapter 23.2, Article IV – Storm Water Management in Prince William County Code. The SWM requirements for Development on Prior Developed Lands are consistent with the State regulations. The County's SWM regulations are more stringent than the State regulations only in certain areas as described below:

VSMP regulations allowed the localities to adopt criteria more stringent than VSMP with proper justification based on specific watershed studies. Alternatively, more stringent regulations that pre-existed prior to January 1, 2013 were exempt. Based on this exemption, Prince William County retained more stringent regulations on flood control in critical watersheds to control the

25-year storm to prevent localized flooding events. In addition, the County retained its authority to require the control of the 100-year flood, for proposed developments located upstream of existing residential developments with required minimum lot sizes less than one acre and adjoining special flood hazard areas. These requirements are in addition to the required control of 2- and 10-year frequency storms per state regulations.

Prince William County employs 11 full-time site inspectors. In addition, the County has five full-time engineers to review the land development plans for E&S and SWM requirements. All our site inspectors and plan reviewers are duly certified for erosion control and SWM (see Table 1). In Prince William County, maintaining these certifications is a condition for the continued employment. Prince William County is committed to providing continuing education and training to its employees on E&S and SWM.

Table 1 – Certifications for Plan Reviewers and Inspectors

Last Name	First Name	Job Title	Stormwater Management - Plan Reviewer		Erosion and Sediment Control (ESC) Combined Administrator		Dual Plan Reviewer - Erosion and Sediment Control and Stormwater Management		Stormwater Management Program Administrator		Assoc. of State Floodplain Managers		Va. Engineering License	
			Cert. #	Exp. Date	Cert. #	Exp. Date	Cert. #	Exp.Date	Cert. #	Exp. Date	Issued	Expiration	Lic. #	Expiration
Bidari	Rajendra P.	Engineer IV					DPR0117	12/28/2018	SWPA0156	3/9/2019	4/30/2010	7/31/2018		
Djebbari	Youssef	Engineer II	SWPR0217	4/18/2019									0402036273	1/31/2018
El-Hage	Michael K.	Engineer III	SWPR0213	4/2/2019	304	11/30/2017							0402026250	6/30/2019
Feshari	Farhang	Engineer III					DPR0124	5/17/2019					0402028201	2/28/2019
Maxwell	David	Engineer III	SWPR0218	4/21/2019									0402046547	1/31/2018

Inspector Name	Job Title	State Water Control Board - Stormwater Management Certification		State Water Control Board Dual Inspector		State Water Control Board E&S Inspector Certification	
		Cert. #	Exp. Date	Cert. #	Exp. Date	Cert. #	Exp. Date
Todd Barton	Site Inspector Area 5	SWIN0804	8/3/19			ESIN0213	5/12/18
Bob Cook	Site Inspection Supervisor (West County)			DIN0533	7/11/19	1465	11/30/18
Phil Darden	Site Inspection Supervisor (East County)	SWIN0347	10/5/18	DIN0641	11/30/18	1802	5/31/19
Philip Darko	Site Inspector Area 6A&B	SWIN0528	1/28/19	DIN0538	1/28/19	3532	11/30/18
Stefan Gitchev	Site Inspector Area 2			DIN0535	10/3/19	ESIN0351	2/23/19
Jeremiah Goodman	Site Inspector - Area 6C	SWIN0889	11/28/19	DIN0537	11/28/19	ESIN0475	9/30/19
Doo Lee	Site Inspector Area 8 (Potomac Shores)	SWIN0580	2/18/19			ESIN0136	10/16/17
Jalal Qaradaghi	Site Inspector - Area 1	SWIN0871	11/2/19	DIN0536	11/30/19		
Mukesh Patel	Site Inspector - Area 3	SWIN0371	10/20/18	DIN0513	11/30/18	1/21/06	11/30/18
Bigyan Shrestha	Site Inspector - Area 4	SWCA0330	4/9/19			ESIN0191	3/5/18
Wray, Shawn	Site Inspector - Area 7	SWIN0360	10/15/18			3774	11/30/19
Jessica Adams	SWM Facilities Inspector	SWIN0314	6/24/20	DIN0678	6/24/20	ESIN0641	8/15/18
Prem Poudel	SWM Facilities Inspector	SWIN0871	11/2/19	DIN0536	11/30/19		

The land development plan review, inspection and enforcement of E&S and SWM regulations are performed by a single agency in Prince William County. The Environmental Services Division of the Department of Public Works is directly responsible for administering the program. Having a streamlined program under one agency is very helpful in ensuring the consistent interpretation and enforcement of applicable ordinances. The County continues to require the Responsible Land Disturbance (RLD) certifications prior to issuing the land disturbance permits. The County's E&S

Administrator conducts periodic joint meetings with the plan reviewers and the site inspectors for the continued improvement of the programs.

Prince William County has developed a mobile application for in E&S and VSMP inspections. This system runs on tablet devices (IPad) provided to each site inspector. Follow up inspections, violation notices, and inspection checklists are all managed through the mobile application. This application has enhanced the inspection efficiency and brought added consistency among all site inspectors .

For the period July 1, 2016 thru June 30, 2017, Prince William County approved a total of 191 land development plans with a cumulative land disturbance of 1,478.64 acres.

Table 2, presented below, summarizes the number of land disturbing activity inspections conducted and the number and type of each enforcement action taken for Erosion & Sediment Control.

Table 2 – Erosion and Sediment Control Program Summary

Month	Erosion Inspections	Site Inspections	Violations	Notice to Comply	Inspection Notice	Stop Work
Jul-16	784	390	1	0	18	0
Aug-16	907	447	1	0	34	0
Sep-16	331	186	0	0	5	0
Oct-16	993	639	0	0	0	0
Nov-16	836	523	0	0	0	0
Dec-16	934	573	0	0	1	0
Jan-17	1101	685	0	0	8	0
Feb-17	1043	562	6	0	6	0
Mar-17	1122	615	2	0	17	0
Apr-17	1056	690	2	1	13	0
May-17	1121	614	8	1	4	0
Jun-17	807	551	2	0	11	0
Total	**11035**	**6475**	**22**	**2**	**117**	**0**

Our stormwater management program is consistent with the Virginia Stormwater Management Act §62.1-44.15:24 of the Code of Virginia and Virginia Stormwater Management Program Regulations 9VAC25-870 et seq.

Prince William County continues to implement a robust program to address the post-construction discharges from new developments and redevelopments by ensuring the long-term operation and maintenance of these SWM controls. We have a dedicated team for the inspection and maintenance of all county-maintained SWM facilities. All the county-maintained and the county-owned facilities are inspected annually. The County inspects all the privately-maintained SWM facilities once within the 5-year permit cycle. The owners of these facilities receive the County's inspection reports along with the identification of deficiencies that must be corrected within the

specified deadline. Our staff follows-up to ensure maintenance and seek the County Attorney's assistance as necessary for enforcement.

Prince William County's strategies to address the stormwater controls that are designed to treat the stormwater runoff solely from individual residential lot are summarized in BMP Table 7-6, included in Appendix A**.** The Table summarizes the party responsible for the maintenance and the applicable deed restrictions and agreements. For the individual infill lots outside the common plan of development, the County allows the use of the "Agreement in lieu of a SWM Plan".

b. Retrofitting on Prior Developed Lands

BMP 1 – Implementation of TMDL priority Projects

The County is in the process of implementing priority projects. Seven projects were selected from the list of prioritized projects described in section III.3. Six of these projects have been completed as of FY17. The last project will be completed no later than 54 months from permit issuance and will be implemented to meet the requirements set forth in Part I.D of the County's MS-4 permit (permit # VA0088595). A list of these projects can be found in Table 3 below. For a detailed summary, please see Section III.1.

Table 3 – Priority Projects by Completion Year

Number	Project Name	Completion Year
1	SWM Facility No. 99 – Water Quality Retrofit	FY16
2	Hylbrook Park	FY16
3	SWM Facility No. 28 – Water Quality Retrofit	FY17
4	Reach 5 Stream Restoration	FY17
5	Dewey's Creek Reach 4	FY17
6	East Longview	FY17
7	SWM Facility No. 498	Expected: FY18

BMP 2 – Implementation of Non-Priority Projects

No additional non-priority restoration or retrofit projects were completed during FY17.

c. Roadways

BMP 1 – Maintain Accurate List of Prince William County Owned Roadways

Although the Virginia Department of Transportation (VDOT) maintains a majority of the roadways and right of way areas within Prince William County, the County is responsible for the maintenance of some roadways and parking lots. VDOT operates under its own phase II stormwater permit, and coordination regarding issues with MS-4 physical-interconnectivity is required as part of both permittee's MS-4 requirements (see section II.m). The County currently operates and maintains parking lots associated with County facilities.

As part of its permit responsibilities PWC has generated a list of all county maintained parking lots, streets, and roadways and the acres treated/not treated by BMPs. This list will be updated yearly as changes to County Maintained roadways may change over the lifespan of the permit. The County has 75 total parcels with impervious parking lots or roads. There are 48 parcels containing County maintained impervious roadways totaling 12.4 miles or 41.9 acres, in addition, there are 69 parcels with impervious parking lots totaling 121.8 acres. Some parcels may contain both sections of impervious roadway and parking lot space.

Table 4 – County Maintained Roadways, Streets, and Parking lots

ST NO	ST NAME	ST TYPE	DEED ACRES	DESCRIPTION	Imp. Parking Lot? (Yes=1; No=0)	Area of Imp. Parking Lot (Acres)	Imp. Road? (Yes=1; No=0)	Imp. Road (Linear Ft)	Imp. Road (Acres)	Site BMPs (Yes= 1; No=0)	Parking Lots Treated by BMPs (Acres)	Imp. Roads Treated by BMPs (Acres)	Imp. Roads Treated by BMPs (Miles)	Imp. Roads Not Treated by BMPs (Miles)
4925	CATHARPIN	RD	1.216	LAWNVALE ESTATES SEC 2 R/W PRIVATE ROAD	0		1	880	0.38	0	0	0	0.00	0.17
13001	CHINN PARK	DR	77.003	CHINN PARK	0		1	97	0.05	1	0	0.05	0.02	0.00
13131	PUBLIC SAFETY	DR	12.081	PUBLIC SAFETY FACILITY - ACREAGE	0		1	585	0.15	1	0	0.15	0.11	0.00
5049	WATERWAY	DR	8.210	MONTCLAIR LIBRARY (UNDER CONSTRUCTION)	0		1	716	0.801	1	0	0.801	0.14	0.00
8636	WELLINGTON	RD	0.857	PWC JUVENILE CTR	0		1	284	0.16	1	0	0.16	0.05	0.00
1040	EXPRESS	DR	2.538	VRE TRAIN STATION WOODBRIDGE	0		1	483	0.65	1	0	0.65	0.09	0.00
7625	AARON	LN	15.264	ELLIS L BARRON PARK	1	0.29	0			1	0.29	0	0.00	0.00
12560	ADEN	RD	97.074	NOKESVILLE COMMUNITY PARK	1	1.87	1	4393	1.4	1	1.87	1.4	0.83	0.00
5901	ANTIOCH	RD	3.800	FIRE STATION ANTIOCH ROAD/ DOMINION VALLEY	1	1.17	1	897	0.62	1	1.17	0.62	0.17	0.00
8051	ASHTON	AV	4.177	BULL RUN LIBRARY	1	1.94	1	231	0.15	1	1.94	0.15	0.04	0.00
7500	BEN LOMOND PARK	DR	240.607	BEN LOMOND PARK	1	1.92	1	1010	0.86	1	1.92	0.86	0.19	0.00
14730	BIRCHDALE	AV	8.656	BIRCHDALE PARK	1	0.77	0			0	0	0	0.00	0.00
14998	BIRCHDALE	AV	0.836	VFD FIRE STATION	1	0.33	1	58	0.038	0	0	0	0.00	0.01
15520	BLACKBURN	RD	42.452	RIPPON LODGE	1	0.48	1	1050	0.58	1	0.48	0.58	0.20	0.00
12401	BRAEMAR	PY	15.172	BRAEMAR PARK	1	0.55	0			1	0.55	0	0.00	0.00
14418	BRISTOW	RD	132.734	HELWIG PARK & LIBRARY	1	6.5	1	3,800	2.18	1	6.5	2.18	0.72	0.00
13065	CHINN PARK	DR	14.647	CHINN PARK COMPLEX (Library, Aquatic Center)	1	4.86	1	509	0.29	1	4.86	0.29	0.10	0.00
13850	CHURCH HILL	DR	5.086	COMMUNITY CENTER	1	0.49	1	547	0.25	0	0	0	0.00	0.10
15150	CLOVERDALE	RD	30.190	CLOVERDALE PARK	1	1.57	1	1122	0.49	0	0	0	0.00	0.21
10501	COPELAND	DR	2.974	SUDLEY MANOR COMMUNITY CENTER	1	0.74	0			0	0	0	0.00	0.00
12380	COTTON MILL	DR	4.770	LAKE RIDGE MARINA	1	1.02	1	1163	0.65	1	1.02	0.65	0.22	0.00
12371	COTTON MILL	DR	67.064	LAKE RIDGE PARK, GOLF COURSE	1	2.01	1	1179	0.66	1	2.01	0.66	0.22	0.00
7	COUNTY COMPLEX	CT	65.547	STADIUM COMPLEX	1	4.88	1	950	0.54	1	4.88	0.54	0.18	0.00
1	COUNTY COMPLEX	CT	40.676	McCOURT & DEVELOPMENT SERVICES BUILDINGS	1	7.03	1	5085	4.8	1	7.03	4.8	0.96	0.00
5180	DALE	BL	7.161	PARKS SKATE NATION	1	1.48	0			1	1.48	0	0.00	0.00
5070	DALE	BL	6.179	BOYS AND GIRLS CLUB	1	0.38	0			1	0.38	0	0.00	0.00

5100	DALE	BL	3.500	BOYS/ GIRLS CLUB/COMMUTER PARKING LOT	1	2.61	1	338	0.24	1	2.61	0.24	0.06	0.00
5301	DALE	BL	218.234	ANDREW LEITCH PARK	1	1.95	1	933	0.46	1	1.95	0.46	0.18	0.00
4249	DALE	BL	0.478	DALE CITY LIBRARY	1	0.1	0			0	0	0	0.00	0.00
14012	DAWSON BEACH	RD	6.230	COMMUNITY CENTER	1	0.16	1	1444	0.47	0	0	0	0.00	0.27
15941	DONALD CURTIS	DR	17.091	FERLAZZO BLDG	1	4.9	1	600	0.5	1	4.9	0.5	0.11	0.00
4100	EXETER	DR	5.688	BRITTANY PARK	1	0.96	1	334	0.16	1	0.96	0.16	0.06	0.00
15611	FARM CREEK	DR	2.427	FARM CREEK VRE COMMUTER LOT	1	1.22	0			1	1.22	0	0.00	0.00
15601	FARM CREEK	DR	4.413	FARM CREEK VRE COMMUTER LOT	1	2.65	1	762	0.88	1	2.65	0.88	0.14	0.00
12993	FITZWATER	DR	0.287	NOKESVILLE LIBRARY - PCL 1	1	0.09	0			1	0.09	0	0.00	0.00
12997	FITZWATER	DR	0.287	NOKESVILLE LIBRARY - PCL 2	1	0.05	0			1	0.05	0	0.00	0.00
8900	FREEDOM CENTER	BL	15.398	WESTERN POLICE STATION	1	4.15	1	1453	1.03	1	4.15	1.03	0.28	0.00
13030	HARBOR	DR	2.293	COMMUTER LOT - TACKETTS MILL	1	1.47	0			1	1.47	0	0.00	0.00
13509	HILLENDALE	DR	3.426	COMMUTER LOT - HILLENDALE RD	1	2.23	0			1	2.23	0	0.00	0.00
13499	HILLENDALE	DR	21.901	JOHN JENKINS PARK	1	0.16	1	413	0.26	1	0.16	0.26	0.08	0.00
4603	JAMES MADISON	HY	163.633	JAMES LONG PARK	1	3.55	1	3025	2.02	1	3.55	2.02	0.57	0.00
15904	JEFFERSON DAVIS	HY	0.960	EASTERN FUELING STATION	1	0.74	0			1	0.74	0	0.00	0.00
14945	JEFFERSON DAVIS	HY	5.065	HILDA BARG HOMELESS CENTER	1	0.3	1	468	0.25	1	0.3	0.25	0.09	0.00
14450	JOHN MARSHALL	HY	3.847	FIRE STATION	1	0.86	1	435	0.26	1	0.86	0.26	0.08	0.00
4701	LOCUST SHADE	DR	642.151	LOCUST SHADE PARK AND FOREST GREEN GOLF	1	3.9	1	7170	3.95	1	3.9	3.95	1.36	0.00
8460	MAPLEWOOD	DR	27.478	JOSEPH READING PARK	1	0.4	1	1162	0.62	1	0.4	0.62	0.22	0.00
8601	MATHIS	AV	2.748	CENTRAL LIBRARY MANASSAS	1	1.25	0			0	0	0	0.00	0.00
14716	MINNIEVILLE	RD	26.333	HOWISON HOMESTEAD PARK	1	1.3	1	899	0.53	1	1.3	0.53	0.17	0.00
14400	MINNIEVILLE	RD	0.367	DALE CITY RECREATION CENTER PARKING LOT	1	0.23	0			1	0.23	0	0.00	0.00
14300	MINNIEVILLE	RD	30.862	DALE CITY RECREATION CENTER	1	1.4	1	164	0.31	1	1.4	0.31	0.03	0.00
2081	OLD BRIDGE	RD	0.700	OLD BRIDGE COMMUTER LOT	1	0.39	0			1	0.39	0	0.00	0.00
2095	OLD BRIDGE	RD	1.138	OLD BRIDGE COMMUTER LOT	1	1.12	0			1	1.12	0	0.00	0.00
2201	OPITZ	BL	3.778	POTOMAC REGIONAL LIBRARY	1	0.93	1	53	0.038	0	0	0	0.00	0.01
10699	PIPER	LN	40.330	AIRPORT VRE STATION & COMMUTER LOT	1	4.44	1	1902	1.3	1	4.44	1.3	0.36	0.00

13800	POP MOUBRY	PL	20.880	LANCASTER PARK	1	0.17	1	258	0.13	1	0.17	0.13	0.05	0.00
14700	POTOMAC MILLS	RD	3.580	PRTC POTOMAC MILLS	1	1.78	1	419	0.34	1	1.78	0.34	0.08	0.00
14730	POTOMAC MILLS	RD	0.787	PRTC - HOMELESS SHELTER	1	0.35	0			1	0.35	0	0.00	0.00
14716	POTOMAC MILLS	RD	5.507	PRTC POTOMAC MILLS	1	1.9	0			1	1.9	0	0.00	0.00
13161	PUBLIC SAFETY	DR	8.276	PUBLIC SAFETY TRAINING FACILITY - PCL B	1	0.4	0			1	0.4	0	0.00	0.00
13101	PUBLIC SAFETY	DR	25.052	PUBLIC SAFETY TRAINING FACILITY - PCL A	1	2.29	1	2581	1.8	1	2.29	1.8	0.49	0.00
12731	RIDGEFIELD VILLAGE	DR	4.400	EARL CUNARD PARK	1	0.18	0			1	0.18	0	0.00	0.00
17301	RIVER RIDGE	BL	6.262	LACEY COMPTON PARK - WAYSIDE VILLAGE	1	0.35	0			1	0.35	0	0.00	0.00
16530	RIVER RIDGE	BL	5.656	RIVER OAKS FIRE STATION	1	1.03	1	854	0.57	1	1.03	0.57	0.16	0.00
16198	SILVER LAKE	RD	43.753	SILVER LAKE - EQUESTRIAN CENTER	1	0.8	0			1	0.8	0	0.00	0.00
15960	SINDLINGER	WY	4.400	FERLAZZO CENTER	1	1.42	0			1	1.42	0	0.00	0.00
13455	TELEGRAPH	RD	24.609	HORNER RD COMMUTER PARKING LOT	1	10.9	1	1531	2.3	1	10.9	2.3	0.29	0.00
12051	TYGART LAKE	DR	42.074	BROAD RUN LINEAR PARK - PUMP STATION	1	0.38	0			1	0.38	0	0.00	0.00
10801	UNIVERSITY	BL	26.403	INNOVATION - ATCC SITE	1	2.78	1	1825	1.04	1	2.78	1.04	0.35	0.00
11930	VALLEY VIEW	DR	125.626	VALLEY VIEW PARK	1	5.4	1	3644	2.8	1	5.4	2.8	0.69	0.00
14300	VETERANS	DR	78.114	VETERANS MEMORIAL PARK	1	3.21	1	4221	2.3	1	3.21	2.3	0.80	0.00
14631	VINT HILL	RD	165.000	PRINCE WILLIAM GOLF COURSE	1	0.8	1	1736	0.804	1	0.8	0.804	0.33	0.00
4450	WATERWAY	DR	13.802	ANN MONCURE WALL PARK	1	1	1	1373	0.66	1	1	0.66	0.26	0.00
8642	WELLINGTON	RD	1.263	PWC JUVENILE CENTER	1	0.17	1	357	0.204	1	0.17	0.204	0.07	0.00
2430	WEST LONGVIEW	DR	4.156	HYLBROOK PARK	1	0.59	0			0	0	0	0.00	0.00
14811	DUMFRIES	RD	1061.984	FLEET BUILDING PARKING LOT ONLY	1	2.09	0			0	0	0	0.00	0.00
				TOTALS	**69**	**121.8**	**48**	**65,393**	**41.9**		**112.8**	**40.3**	**11.6**	**0.8**

BMP 2 – Good Housekeeping Practices on County Maintained Roadways

Prince William County contracts out maintenance activities for County maintained parking lots, streets, and roadways. These activities include sweeping, line painting, and asphalting. No aggregate materials are stored as part of B&G roadway maintenance activities at this time.

Asphalt maintenance to parking lots and roadways are scheduled to be performed cyclically, with the average asphalt lifespan of 17 years. Each lot and roadway is listed for evaluation every fiscal year. Paint maintenance to parking lots is performed every 4 years. Street sweeping to parking lots is scheduled to be performed every 2 years. All maintenance activates are designed to conform to good housekeeping and pollution prevention practices in a manner to minimize the discharge of pollutants.

Buildings and Grounds maintenance vehicles are stored in a manner to reduce the discharge of pollutants. Vehicles are serviced and repaired by PWC Fleet Management Division and are tracked by GPS to provide feedback on fuel usage and routing. This is designed to improve efficiency and minimize pollutant discharge.

Prince William County established a county-wide IDE (Illicit Discharge Elimination) policy to promote good housekeeping practices across all municipal facilities. A full copy of this policy can be found in Appendix I.

BMP 3 – Good Housekeeping Practices for Winter Weather Maintenance

Prince William County Buildings and Grounds and Construction Services are responsible for snow removal at all county facilities maintained by Buildings and Grounds. Snow removal activities are not performed on any other County maintained roads, streets, or parking lots. Salt, sand, and calcium chloride are the specified materials used in snow removal activities. Any materials used for deicing and sanding activities are stored and maintained in a manner to prevent runoff from precipitation.

Prince William County established a county-wide IDE policy to promote good housekeeping practices across all municipal facilities. A full copy of this policy can be found in Appendix I.

d. Pesticide, Herbicide, and Fertilizer Application

Prince William County Public Works will promote and encourage the proper use, application, and disposal of pesticides, herbicides and fertilizers by public, commercial, and private applicators and distributors.

Working with the Virginia Cooperative Extension Service, their staff help support Prince William County applicators and distributors with proper training and coordination with the Virginia Department of Agriculture and Consumer Services (VDACS)

- VDACS provides ongoing communication with all certified applicators and distributors.

- The Virginia Cooperative Extension Service provides training and education on the use, application and disposal of pesticides, herbicides and fertilizers.

There is an annual collection to properly dispose of the materials in the state. It is held in a different region each year. The Cooperative Extension works with our local applicators and distributors to ensure they are aware of the collection.

BMP 1 – Identify Nutrient Applied County Lands

Prince William County is dedicated to minimizing the effects of pesticides, herbicides, and fertilizer use on the Chesapeake Bay. The County has identified all lands of which nutrients are applied to a contiguous area of more than one acre. The latitude and longitude of these lands will be reported to DEQ as requested. This data will be used to determine where Nutrient Management plans need to be developed. This list is displayed in the following section, along with the status of implementation for each site.

BMP 2 – Develop and Implement Turf and Landscape Management Plans

The County is in the process of developing and implementing Turf and Landscape nutrient management plans for County lands where nutrients are applied to greater than one contiguous acre. Currently just over 50% of lands owned by the County are covered under nutrient management plans. Table 5 below provides a summary of lands of which nutrients are applied to greater than one contiguous acre and the progress of the County's NMP.

Table 5 – Nutrient Management Plan Implementation

Name	Acres	Longitude (W)	Latitude (N)	Acres with plans (field measured)	Effective date
H.L. Mooney Plant	4.9	38.6146	77.2684	4.9	7/12/2016
Spittle Building	2.4	38.681184	77.349202	2.4	7/12/2016
Anne Wall	11.31802	77*20'39"	38*36'14"		
Ben Lomond	49.09092	77*29'37"	38*47'51"		
Ben Lomond Community	1.6	77*30'22"	38*47'22"	1.6	7/1/2016
Birchdale Rec	2.983583	77*18'40"	38*37'48"		
Braemar	3.418874	77*34'9"	38*44'2"		
Catharpin	9.03	77*33'56"	38*51'16"	9.03	4/1/2017
Chinn	16.84186	77*19'49"	38*40'14"		
Cloverdale	13.44742	77*19'10"	38*37'20"		
Dale City Rec	7.371609	77*20'42"	38*38'35"		

Fairmont	13.2317	77*29'27"	38*46'54"		
Forest Greens Golf	105.42	77*21'14"	38*32'35"	105.42	11/1/2014
Hellwig	36.84	77*27'0"	38*38'20"	36.84	4/1/2017
Howison	9.82	77*22'57"	38*38'2"	9.82	4/1/2017
James Long	17.87	77*38'5"	38*51'13"	17.87	4/1/2017
Lake Ridge Golf	16	77*19'15"	38*41'31"	16	11/1/2014
Leitch	2.798762	77*22'16"	38*39'26"		
Leitch/VEPCO	16.21099	77*22'6"	38*39'13"		
Locust Shade	7.008583	77*21'4"	38*32'0"		
Mayhew	7.170033	77*29'29"	38*48'24"		
Nokesville	42.94316	77*34'39"	38*41'8"		
Prince William Golf	200	77*37'50"	38*44'51"	200	11/1/2014
Stadium	22.77525	77*21'5"	38*41'1"		
Turley	2.467387	77*18'34"	38*37'40"		
Valley View	69.88235	77*32'22"	38*42'4"		
VEPCO	3.908403	77*21'49"	38*38'53"		
Veterans	48.58425	77*14'59"	38*38'32"		
Barg Homeless	1.716532	77*16'32"	38*37'36"		
Boys Home /Winter Shelter	1.92	77*17'43"	38*37'50"	1.92	10/30/2015
Bull Run Library	1.56	77*31'14"	38*47'12"	1.56	10/30/2015
Central Library	1.48	77*27'19"	38*46'7"	1.48	4/11/2016
Dawson Beach	4.08	77*14'42"	38*38'53"	4.08	2/24/2016
Fire 20	1.59	77*18'23"	38*38'51"	1.59	5/17/2017
Fire 23	3.104318	77*18'19"	38*35'11"		
Fire 4	1.7	77*37'10"	38*48'14"	1.7	2/2/2016
Garfield Ferlazzo	5.9	77*17'40"	38*36'29"	5.9	5/16/2017
Juvenile Detent/ Gypsy	1.934307	77*25'6"	38*37'57"		
Juvenile Emergency Shelter	1.118525	77*31'8"	38*45'48"		
Manassas Court	8.1	77*28'44"	38*45'9"	8.1	6/24/2015
McCoart	13.97	77*21'8"	38*40'49"	13.97	3/14/2015
PWC Safety Training Center	6.27211	77*35'7"	38*39'52"		
Western PD	7.27	77*31'2"	38*45'45"	7.27	4/1/2015
Total	**807.049**		**Total to Date**	**451.45**	
Covered	**55.94%**		**48-Month Goal**	**322.16**	

Staff that are certified in nutrient management planning develop turf and landscape management plans. These certifications are summarized in Table 6.

Table 6– Name, certificate number, and expiration date of all nutrient management planners for Prince William County

Plan Writer	Certificate number	Expiration date
Julie Flanagan	#772	2/2018
Clay Morris	#757	8/2019
Paige Thacker	#759	8/2019
Nancy Berlin	#801	8/2018
Thomas Bolles	#732	12/2018
Kevin Flickinger	#842	8/2019

BMP 3 – Develop and Employ Good Housekeeping Practices for storage transport and disposal of pesticides, herbicides, and fertilizers.

The County works with its Mosquito Forest Pest Management, Buildings and Grounds, and Parks and Recreation departments to ensure good housekeeping practices are followed. This includes the storage, transport, and disposal of pesticides, herbicides, and fertilizers. All County staff working with pesticides, herbicides, insecticides, and fertilizers are trained and maintain required certifications. Good housekeeping practices are further defined in the Illicit Discharge Elimination (IDE) policy. The County evaluated each of these departments for compliance with this policy through IDE compliance reports. These reports and the policy can be found in Appendix I. They are also described further in SOPs found in Appendix D.

In addition, the County works with various volunteer organizations to ensure the proper use and storage of pesticides, herbicides, and fertilizers. For instance, the Environment and Natural Resources program of Virginia Cooperative Extension Service (VCE) provides research based information to help citizens improve their lawns and landscapes without negatively affecting the environment. Services include:

- Horticulture Help Line and Plant Clinics at local Garden Centers and farmer's market to answer questions about insect, disease or gardening problems
- BEST Lawns is a lawn education program that provides lime and fertilizer recommendations based on a soil test and lawn measurements, as well as best practices for lawn care
- Free lectures to the public
- Education for businesses and non-profit organizations in the management of storm water runoff
- Training for interested citizens who wish to become Master Gardener volunteers
- Low maintenance gardening techniques demonstrated at the Teaching Garden
- Plant a Row for the Hungry collections at local Farmer's Markets
- Cooperative Extension agent is on the board of the Prince William Soil & Water Conservation District
- Emergency management assistance to local agricultural producers
- Pesticide Safety training and best management educational workshops for the Green Industry

VCE conducts a post survey gauging awareness and behavior changes made through educational programming. It tracks program effectiveness and reach by evaluating the number of people educated and the number of people that implement the practices they learn.

The County will continue to define and promote good housekeeping practices for storage transport and disposal of pesticides, herbicides, and fertilizers.

BMP 4 – Develop and Employ Integrated Pest Management Plans

The County will track and employ Integrated Pest Management Plans where applicable. Currently the county maintains all lands under IPM with the mission of the program to survey, reduce, and control populations when possible, of mosquitoes and forest pests. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. The data gathered in the process is analyzed and used to track population trends, determine appropriate control measures and evaluate effectiveness of the control efforts. Reduction and response consists of implementing IPM pest control measures to suppress populations of mosquitoes, gypsy moths and fall cankerworms. Selective application of environmentally-compatible, EPA-registered products are utilized to control these pests. Several factors from our surveillance program and other environmental factors help in determining treatment options.

During the reporting period, the County applied larvicide to a total of 16.57 acres including 4.61 acres of stormwater management facilities and 11.96 acres of lands not designated as stormwater management facilities. In addition, the Mosquito and Forest Pest Management Branch applied adulticide to a total of 2,398.45 acres, bringing the total County lands treated by IPM to 2,431.59 acres.

e. Illicit Discharge and Improper Disposal

BMP 1 – Elimination of Illicit Discharges and Improper Disposal

The Prince William County's Illicit Discharge Detection and Elimination (IDDE) Program consists of elements designed to identify, mitigate, and prevent the release of non-stormwater discharges into its storm sewer system, and thus into State and Federal waters. Through development of County Fire Protection, Zoning, Building Development, and Stormwater Management Ordinances; Prince William County has prohibited the discharge of any non-stormwater element determined to be contributing significant amounts of pollutants to its storm sewer system. This includes the dumping or improper disposal of motor vehicle fluids, household hazardous wastes, sanitary sewage, grass clippings, leaf litter, and animal wastes. The County defines all discharges categorized as non-stormwater discharges, as well as those discharges not addressed as illicit discharges in accordance with part I.A.1.b) in permit #VA0088595 in Article II sec. 23.2-4.1 of Prince William County's Code of Ordinances. By issuance of a Notice of

Violation, illicit discharges are required to be eliminated within 30 days of discovery, unless removal is not possible within that timeframe. In these instances, reasonable and prudent measures to minimize discharge will be taken and an action plan for mitigation/removal will be required.

Table 7 below summarizes the results of the Illicit Discharge Program. The program is broken into 3 elements; Dry weather outfall inspections (see section II.1 for more details); reported and observed discharges; and shopping center surveys. Shopping surveys are quantitative assessments of the state of shopping centers throughout the County as it pertains to stormwater pollution prevention. Items such as the number, location, and maintenance of dumpsters, compactors, and grease traps are evaluated during this assessment.

Table 7 – Illicit Discharge Program Overview

Type		No.	Percentage
Dry Weather Outfall Inspections		970	
	Non-flowing	865	89.2%
	Flowing	114	11.8%
	Groundwater	44	4.5%
	Surface Water	34	3.5%
	Other	22	2.3%
	Illicit Discharges	4	0.4%
Reported and Observed Discharges		49	
	Non-founded/minor	39	79.6%
	Illicit Discharges	10	20.4%
Shopping Center Surveys		12	
	Deficiencies	11	91.6%
	Illicit Discharges	0	0.0%
	Average Score	3.67	
Total Illicit Discharges		**14**	
	Dry Weather Monitoring	**4**	**28.6%**
	Reported	**10**	**71.4%**
	Shopping Survey	**0**	**0.0%**

During the reporting period, Prince William County responded to 49 complaints of illicit discharge, a significant increase from the 30 reported discharges from the previous reporting period. All but one have been resolved. The suspect in that case currently faces six criminal charges by the Fire Marshall's Office. See Table 8 below for more detail on reported Illicit Discharge cases handled by the County in FY17.

Table 8 – Reported Illicit Discharges for FY17

Illicit Discharge - Reported/Observed Discharges - FY2017									
Complaintant Information		Discharge Information							
Citizen/County Staff	Date	Discharge Description	Discharge Location	Land use Type	Date of initial inspection	NOV Issued	Date of last Inspection	Comments/Notes	Status
County Staff	7/8/2016	Oils (Tar) discharging from Leaking Paving Truck	Storm sewer inlet at intersection of Roundtree Dr/Rowser Dr	Road User	7/11/2016	N/A	7/11/2016	Inspected the tar discharge site, located at intersection of Roundtree Dr and Rowser Dr. Tar stain was observed dry at surrounding pavement and drop inlet of road curb & gutter. The impact was insignificant to storm water and water of the county. Initially the case was handaled by PWC DFR.	Closed
County Staff	7/12/2016	Lead and sulfuric acid run off. In addition, fuel leaks from tanks, used oil containers after fire broke out in building on 7/11. Grease and oils were leaking from junk vehicle.	14823 Dumfries Rd	Industrial/ Auto Warehouse	7/12/2016	N/A	7/12/2016	A visual inspection of the facility was made from the neighboring property since legal access was not permitted. Stains of grease, oils, and other chemicals were observed at multiple locations within the facility. Junk cars were observed leaking where stored. It is a VPDES permitted facility. The case will be handled by DEQ, led by Susan Mackert.	Closed
County Staff	7/15/2016	Cooking oil spill around Famous Dave's Restaurant, Parking lot and continued untill intersection of Caton Hill	2430 Prince William Parkway	Restaurant, Shopping Center and Road	7/18/2016	N/A	7/18/2016	The mitigation activities were reported to be employed around the heavily spilled restaurant areas. The stain from the road and parking lot areas were partially dried and partially washed away by heavy rain of last week. The impact of incident on storm water is insignificant due to diluted volume. Since the spill extended out of PWC's service area and	Closed

		Rd to Killarney Dr						onto VDOT MS-4 jurisdiction, VDOT was notified of the spill on Tuesday 7/19/16.	
County Staff	7/19/2016	Hydrallic Fluid Discharge	5 County Complex Court	Government Building	7/19/2016	N/A	9/20/2016	On July 19th, 2016 County staff observed a large (~20 gal) hydraulic fluid spill outside the Development Services Building at 5 County Complex Court. The spill was the result of a ruptured hydraulic fluid line belonging to a Bates Trucking garbage collection truck. The spill was first detected by County Buildings and Grounds staff, and preventative measures were put in place immediately before allowing discharge to reach the stormsewer system.	Closed
County Staff	7/21/2016	Wooden chips & clippings	14514 Silverdale Drive	Residential	7/21/2016	1-2017	9/22/2016	The citizen complaint about the dumping of woodchips into the storm sewer system at property 14514 Silverdale Drive was received at PWC Neighborhood Services. NOV 1-2017 was issued to the property owner to clean, collect, and dispose of debris from the storm sewer system as soon as possible but not later the 30 days from receipt of the NOV. Mr. Bryan reported the completion of corrected deficiency on same day. Follow up inspection was made on 7/22/2016. The deficiency was found to be corrected.	Closed
County Staff	7/21/2016	Discharging grease and waste food fluid	17247 Wayside Drive	Shopping Center	7/21/2016	2-2017	8/8/2016	Fats, oils, and greases were observed spilling on pavement around grease collection tank. NOV was issued to the Property Management Company and notified to the Owner to correct the deficiencies. Follow-up inspection made [8/8] Grease and waste food fluid stains were cleaned.	Closed

County Staff	7/22/2016	Paper brick procees water and paper debris	5157 Olivia WY	Residential	7/22/2016	NA	Periodic, 8/1/2016; 8/16/2016	On July 22, 2016 the complaint about dumping paint and plaster into storm sewer system was reported to PWC Environmental Services. Squeezed process water including some paper debris was observed to be discharged into storm water system. The scale of discharge was minor and Mrs. Birdsong agreed to stop discharging paper debris and process water in future and clean up the debris from drop inlet trash rack. Further discharge of paper debris and paper brick process water were stopped and debris were cleaned so the case has been closed.	Closed
County Staff	7/28/2016	Car wash sludge fluid was leaking through dumpster and flowing towards storm sewer	12831 Harbor Drive	Car Wash	7/28/2016	3-2017	Periodic 8/1/2016, 8/8/2016	Fluid from a leaky dumpster was found flowing towards the storm sewer system at Tacketts Mill Car Wash, located at 12831 Harbor Drive. Cotton towels were immediately used to absorb leachate flowing on the pavement to cease the flow directed towards storm drain. Follow-up inspection made[8/8]; leaking dumpster was replaced with another non leaking container. The fluid stain was cleaned from the pavement.	Closed
Citizen	8/4/2016	Discharge of Glycol solution into stormsewer connected floor drain	3799 Waterway Dr	Elementary School	N/A	N/A	N/A	An anonymous report from an on site contractor regarding another subcontractor during school maintenance work regarding the potential discharge of glycol solution down a stormsewer connected stormdrain. PWC Schools followed up and reported that the discharge was not a glycol solution but a dyed water solution.	Closed

Citizen	8/9/2016	Discharge of waste food fluid into storm sewer system	4174 Fortuna Center Plaza	Shopping Center	8/9/2016	4-2017	9/9/2016	This Incident was reoccurrence from last year but the case was in begining stage. Set out cement grout was observed on the pavement. After few days [8/9], Environmental Services received a citizen complaint about an illicit discharge into storm sewer system from leaky compactor in the same location. NOV 4-2017 was issued. Follow up inspection was made [9/9]; the leakage was stopped and cement grouts were removed.	Closed
Citizen	8/22/2016	Discharge of lawn clippings into storm sewer system	5710 & 5708 Sailstone Ln	Residential	8/23/2016	NA	8/29/2016	Both residents of property 5710 and 5708 admitted their fault for dumping clippings after mowing their lawns into storm sewer system and agreed to clean up within few days. A follow up inspection was made on 08/29/2016. The clipping from the street and storm sewer system was satisfactorily cleaned up, the case has been closed.	Closed
Citizen	8/22/2016	Discharge of paint into storm sewer system	13920 Greendale Dr	Residential	8/22/2016	N/A	8/22/2016	Paint was observed on external surface of storm water manhole cover. The manhole was opened, there was no paint inside. The impact was observed localized on manhole lid due to small volume of spill. The manhole cover was immediately cleaned by the contractor and agreed to stop spill paint and other unlawful discharge into storm sewer system.	Closed
County Staff	9/13/2016	Discharge of floor finish fluid vaccumed by floor grinder	9897 Dochart Sound Ln	Residential	9/13/2016	NA	9/13/2016	White stains were observed at curb and gutter during dry weather monitoring on 9/13/2016 . The contractor MP Remodeling working on 9897 Dochart Sound Ln was responsible for dumping. The dumping substance was like a very fine white sand. Conversation was immediately	Closed

								made with contractor. As per contractor, ½ bucket of paste vacuumed with floor grinder was poured into gutter inlet. Even though it is not allow to discharge into storm sewer system, NOV didn't issue since the contractor has immediately started clean up work. The spilled was localized and less harmful with compared to other toxic chemicals and paints. Follow up inspection made on 9/14; the deficiency had been corrected. The case has been closed.	
Citizen	9/14/2016	Discharge of carpet cleaning chemicals	5602 Mendelmore Way	Residential	9/14/2016	NA	9/14/2016	PWC Environmental Services received a complaint regarding dumping carpet cleaning chemicals into storm sewer system. There was no sign of dumping cleaning chemicals into storm sewer system except faint white stains on drive way of property 5602. Follow up inspection was made on [10/20]. There was no sign of discharge.	Closed
County Staff	9/15/2016	Discharge of laundry operation (Grey) water into storm sewer system	Outfal 5757-001	Residential	9/15/2016	5-2017	9/15/2016	It was confirmed that two different pipes connected with storm sewer inlet. One from 10021 Lomond Drive was responsible for discharging grey water (Laundry water) into storm sewer system. NOV 5-2017 was issued to Mr. Benito. A follow up inspection made [9/26] and the deficiency was found to be corrected.	Closed
County Staff	9/19/2016	Petrolium Spill	SWM Facility 99	Residential	9/19/2016	NA	10/28/2016	The source of contamination was identified to be flush water from parking lot having numerous oil stain patches. The enforcement action over leakage of certified vehicle is really difficult and those vehicles were parking irregularly each day. Follow up inspection was made [10/28]. There was no colorful	Closed

								film over the surface of pond water.	
Citizen	10/19/2016	Cars oil changed and spilled on Street	Streets	Residential	10/18/2016	NA	11/18/2016	Several oils stains spots were observed on street parking beside 13116, 13114, 13115 and 13113 Kittredge Court. Oil stains were found to be localized and not flowing towards storm sewer system. Follow up inspection made [11/18]; No new complaints were made within a month and oil stains were gradually faded out from the pavement.	Closed
Citizen	10/21/2016	Blow out leaf clippings	storm sewer system	Residential	10/21/2016	NA	10/21/2016	Leaves clippings were found to be blown into storm sewer system. The amount of clippings was insignificant.	Closed
County Staff	11/7/2016	Chlorinated water discharge	SWM Facility 454	Residential+Shopping Center	11/7/2016	NA	12/1/2016	The chlorine smell with white foam was noticed at outlet of pond 454 located at 1282 Corbelt Pl. Water quality was tested with YSI professional for pH, DO, Conductivity and temperatures. Tested all results were within standard limits. Desktop analysis was made on collected sample and chlorine was found 0.015 mg/l. Follow up inspection was made [12/1], neither suds nor chlorine smell were noticed during inspection.	Closed
County Staff	11/15/2016	Sludge discharge	storm sewer system	Commercial Facility	11/16/2016	NA	11/16/2016	Mr. Kim Stewart, the Fire Marshal Captain immediately talked to owner and contractor to stop discharging turbid water and sludge into storm sewer systems. Follow up inspection made [11/16]; the sludge was removed from drop inlet. The case has been closed.	Closed

Citizen	11/16/2016	Oil discharging	storm sewer system	Residential	11/16/2016	NA	Periodic 12/1/2016; 3/31/2017	The car parked on the street was slowly leaking which was confirmed to be owned by the home owner of 4223. Oil stains were found to be localized and not flowing towards storm sewer system. Follow up inspection was made [12/1], the oil leaking vehicle was found to be removed. Second follow up inspection made [3/31], previous oil stains were gradually fade out and there was no repetition of same oil discharge problem.	Closed
County Staff	12/11/2016	Oil discharging	storm sewer system	Oil discharge from Commercial truck into storm sewer system	12/9/2016	NA	12/12/2016	The commercial truck leaked out oil on Euclid Ave nearby storm sewer inlet and location was opposite of Euclid Business Center. The Case was handled by PWC Hazmat team in time so that the impact was significantly minimized.	Closed
County Staff	12/11/2016	Chemicals with carwash discharge	storm sewer system	Exxon gas station and convene store with car wash	12/14/2016	6-2017	Periodic 12/19/2016; 1/12/2017; 3/28/2017	An unlawful connection found to be made for carwash to the storm sewer system. NOV 6-2017 was issued on 1/12/2017 to the business owner. Follow up inspection was made on 03/28/2017. The car wash discharge was found to be disconnected from storm water management facility. The case has been closed.	Closed
County Staff	1/4/2017	Exposed recycling piles and product	storm sewer system	Republic Services	1/4/2017	Yes (DFR)	Periodic 01/05/2017; 3/31/2017	It was reported that the recycling facility is well beyond capacity with material stored outside. Fire Marshall office pursued a criminal charges against the facility. The case has been forwarded to DEQ for further enforcement action as it is a VPDES permitted facility.	Closed
County Staff	1/25/2017	Cooking Oil and grease discharge	storm sewer system	TGI Friday Restaurant	1/25/2017	NA	3/28/2017	Upon arrival, grease and cooking oil was spilled over the pavement around the collection tank, located behind the TGI Friday and Bento Cafe Sushi restaurants. Follow up inspection was made on	Closed

								3/28/2017. The deficiency was found to be corrected.	
County Staff	1/25/2017	Waste food fluid, fat, grease and cooking oil discharge	storm sewer system	Potomac Mills Food Court	1/25/2017	NA	2/16/2017	The case has been already handled by PWC Service Authority. Follow up inspection made (2/16). Spilled over cooking oil with food residue was cleaned up and the site was found to be clean.	Closed
Citizen	1/26/2017	Dumping wooden scarp and electric tubes	storm sewer system	Residential	1/26/2017	NA	2/10/2017	Wooden scraps and Mercury Tube lights were disposed on slope potential for impeding storm water flow during heavy rain. Verbal warning was given to home owner Mr. Ghulam Mustafa Janjuah (703-395-7398) to keep water way clean. Follow up inspection was made [2/10], wooden scraps and mercury tubes were removed.	Closed
County Staff	1/30/2017	Petrolium Gas Spill	storm sewer system	Residential	1/30/2017	NA	1/30/2017	On January 30,2017 PWC Environment services received a complaint from Mr. Timothy Luck (the technician of DFR) regarding petroleum gas spill at road accident in front of property 1481 California Street . The Fire Marshal team immediately arrived and captured the flow with hydrocarbon absorbent sheets and granular absorbent materials. There was no significant impact on down stream creek.	Closed
County Staff	2/21/2017	Petroleum Float on SWMP 5158	storm sewer system	Shopping Center	4/10/2017	7,8,9-2017	4/14/2017	On 4/10/2017, DFR team caught the violator dumping petroleum waste into storm sewer system from a tractor trailer. The waste was captured with hydrocarbon booms laid in addition with existing booms. The suspect was taken into custody and charged with 6 criminal charges. The case is being handled by the County Attorney and is considered closed on our end.	Closed

County Staff	2/27/2017	Petroleum stain and odor at outfall	storm sewer system	SWMP-5327	2/27/2017	NA	Periodic 3/2/2017; 3/27/2017	Outfall was found to be dry with black stain at pond 5327 having noticeable gas odor. The grease inceptor was identified within the facility on next follow up inspection [made on 3/2] . Second follow up inspection made [3/27]; grease inceptor was maintained after 20 years to capture grease and oil.	Closed
County Staff	3/21/2017	turbid flow with suds and petroleum waste	Creek	County water	3/22/2017	NA	3/22/2017	PWC IDDE staff received a complain regarding turbid flow having suds and petroleum float on creek passing through Rolling Ford Rd nearby Willington Rd on 03/21/2017. Site was visited on 03/22/2017.The reported discharge wasnt observed at creek.	Closed
County Staff	3/24/2017	Significant amount of suds on creek	Creek	County water	3/27/2017	NA	3/27/2017	PWC IDDE staff received a complain regarding significant amount of suds on creek. No suds found upon arrival	Closed
Citizen	3/27/2017	Cooking oil with bottles (glass) being dumped	Inlet across street	Residential	3/28/2017	NA	Periodic 3/30/2017; 4/14/2017; 8/10/2017	Upon arrival, cooking oil bottles observed dumping into storm inlet, located near 2937 Stockholm Way. The warning letter with education materials was sent [3/30] to each house owner of the vicinity. Follow up inspection made [04/14]. Dumping found to be stopped but cleaning work was pending. Second follow up inspection made [8/10]; manhole found to be clean.	Closed
Citizen	3/31/2017	Suds flowing on creek	Creek across Artemus Drive	Residential	4/5/2017	NA	4/13/2017	Suds observed at outfalls of SWMP 516, 510, 5124 and 5284. Suds could be generated with over application of chemicals and fertilizes on land escaping and gulf course maintenance. Active development was taking place at the catchment of Catharpin creek above Catharpin Rd. The development site is suspected to be a	Closed

								secondary source of suds during rainfall. ESC Area Inspector was notified to adopt effective erosion and sediment control measures who are working for development work in Catharpin catchment. The white substances found to be removed from ground by PWCSA.	
Citizen	4/5/2017	Illicit discharge/ Bad odor with RPA encroachment	onsite and adjoining Creek	Industrial	4/5/2017	NA	4/5/2017	The site was observed to have several piles of timbering waste and some of which was placed in RPA buffer. Pond was filled with sediments and wooden debris. Generators were running in an open space to pump water from the creek at the bank, and gas containers were found to be spread out randomly. Leachates found to be released at the toe of each pile and sludge developed by running vehicles. Vista at Lake Manassas is confirmed to be a VPDES permitted facility. The case was forwarded to DEQ.	Closed
Citizen	4/5/2017	Dumping sharp metal objects, tires, heavy machinery parts	HOA Land	Residential	4/6/2017	NA	4/6/2017	Case was forwarded to HOA for resolution on 4/11/17 as the area of concern is not near any storm drains.	Closed
County Staff	4/17/2017	changing oil and letting the oil run down	run down the driveway to the street	Residential	4/17/2017	NA	4/25/2017	Upon arrival, oil stains were observed on driveway and, suspected to be released during oil change and automotive repair. The spill was neither intentional nor critical. Follow up inspection made [4/25], trash and oil removed.	Closed
Citizen	4/17/2017	Oil spill	storm sewer system	Street parking	4/17/2017	NA	4/17/2017	Upon arrival, reported vehicle was parked along Rolling Brook Rd which could be used for business motive. A automotive part was observed under the vehicle and was covered with metal plate but there was no sign of spilling or dumping oil into storm sewer system or on	Closed

								parking spot.	
Citizen	4/19/2017	Relese trash from construction site	storm sewer system	Residential	4/24/2017	NA	4/24/2017	Citizen complaint was received from Ms. Patricia Flavin regarding trash released into storm sewer system from active construction sites of NV home. Most of the trash found to be associate with construction business. The case was forwarded to Area Supervisor Mr. Robert L. Cook for further steps.	Closed
Citizen	4/25/2017	Dumping Cleaning Chemicals	Road Curbs & Gutter Inlet	Residential	4/25/2017	NA	4/25/2017	The corresponding outfall discharge was observed with some white suds and orange pipe algae. Educational materials were mailed to Angela's Cleaning to make them aware on unlawful discharge. Water sample was taken for water quality test. Most of the water quality parameters were found within standard limits in desktop analysis. The source of discharge was observed a foundation drain from upstream house.	Closed
Citizen	5/11/2017	Dumping Cooking oil	Road Curbs & Gutter Inlet	Residential	5/12/2017	NA	5/15/2017	Inspection was made on 05/15/2017. Dry oil spilled spot was observed at road curb and gutter in front of house 7803 Powhatan Street. Spilled issue was talked with Mr. Rodriguez Hector Ariel, the home owner of 7803 Powhatan Street. He said, the incident had happened unintentionally during haulage house hold waste. Mr. Ariel agreed to clean, stop and will pay attention to handle waste in future. The education materials were hand over to Mr. Ariel after interactions.	Closed

Citizen	5/17/2017	Oil and grease discharge	Road Curbs & Gutter	Residential	5/17/2017	NA	5/17/2017	During field inspection, dry oil stains were observed on street on multiple locations but the site in front of house 15073 was worse than other locations. An interaction made with Mr. Steinmetz Paul, the owner of 15073. He refused to accept complaint charged over him. The violator couldn't identified due to lack of strong evidence. Education materials were handed to make him aware about an unlawful discharge.	Closed
Citizen	5/18/2017	Dumping an illicit discharge	Storm drain at El Charo's restaurant	Restaurant	5/19/2017	10-2017	7/5/2017	An illicit discharge was confirmed coming from the kitchen and directed towards the storm sewer system via parking lot and road curbs and gutters. The source of this problem was a blockage from the kitchen to the sanitary pipe. NOV #10-2017 was issued on site and hand over to the Assistant Manager Mr. Carlos Pineda. Follow up inspection made[7/5/2017]; the deficiencies were found to be mitigated.	Closed
Citizen	5/18/2017	Dumping mud/dirt	On adjacent property	Residential	5/19/2017	NA	5/19/2017	The entire dumping area was approximately 4' high of dirt from existing ground. After reviewing, It came to know that both property owner doesn't have land disturbance permit. The case was forwarded to NSD. NSD has created two cases for further investigation.	Closed
County Staff	5/22/2017	Petroleum Spill	storm sewer system	Gulf Course with Residential	5/22/2017	NA	5/22/2017	The site was visited on 05/22/2017. The spill incident may happened due to accident. The problem was already solved prudently by River Fall HOA .Earthen dam with sand was made to impede discharge. The riprap contaminated with spill was totally replaced with new stones. Petroleum absorbent hydrocarbon booms were installed at outfall and drop	Closed

								inlet. There was no bad impact on down stream creek.	
Citizen	5/23/2017	Oil Sheen	storm sewer system	Residential	5/24/2017	NA	7/24/2017	Oil sheen was observed on a segment of foot trail located near by stormwater management pond. The oil sheen most likely developed due to bacteria. Follow up inspection made [7/24]; the orange algae found to be dry.	Closed
Citizen	6/1/2017	Bad odor	From Storm Sewer System	Residential	6/5/2017	NA	7/24/2017	Upon arrival, faint odor was experienced but it was hard to identify the source. Storm sewer system was inspected by CCTV to identify the source. No source found.	Closed
Citizen	6/5/2017	Discharge of Pet Salon gray water	storm sewer system	Residential	6/6/2017	NA	7/5/2017	Upon arrival, mobile pet salon vehicle was parked on parking lot assigned for 12088 Stallion Court. Storm sewer system was dry but smell of chemical was noticeable at outfall. Discharges have ceased by follow up inspection	Closed
Citizen	6/6/2017	Discharge of Concrete Washwater	storm sewer system	Road Expansion	6/22/2017	NA	6/22/2017	The site was inspected and several dark stains along almost the entire road were noticed. There is no way to fault any discharges on a single person due to the volume of automobiles on the road, and the absence of an active discharge during inspection.	Closed

Reports for the Illicit Discharge cases above are presented in Appendix E. The County expects reported discharges to continue to increase over the next fiscal year. An increase in reported discharges are expected due to a combination of an updated IDDE program, increased citizen awareness of illicit discharge issues through public outreach initiatives, and County Employee training.

No illicit discharges were discovered as a result of the shopping center survey program. Eleven deficiencies were found, four of which were major. No NOVs were issued, and all issues were resolved satisfactorily. Table 9 below describes discharges discovered under shopping center inspections

Table 9 – Deficiencies Discovered Through Shopping Center Surveys

Shopping Center Surveys - FY2017						
Discharge Location	**Date of initial inspection**	**Deficiencies**	**Date of last inspection**	**Comments**	**Deficiency- Major/ Minor**	**Status**
7681 Sudley RD Manassas, VA 20109	7/6/2016	Trash dumped out of caintainer and waste oil & grease stain observed around collection tank	8/17/2016	After outreach effort, deficiencies were found to be corrected .	Major	Case Closed
3314 Old Bridge Rd Woodbridge,VA 22192	8/1/2016	Mishandling of cooking oil and food waste on surrounding pavement	8/30/2016	The deficiencies were found to be corrected.	Minor	Case Closed
12241 Hedges Run Dr Woodbridge,VA 22192	8/1/2016	Shopping center was comparatively clean with minor oil and grease stains.	10/3/2016	Outreach made to waste generating facilities, deficiencies were found to be corrected.	Minor	Case Closed
14328 Jefferson Davis Hwy Woodbridge,VA 22192	8/17/2016	Trash dumped out of dumpster and waste oil & grease stain observed around collection tank	9/20/2016	After outreach effort, deficiencies were found to be corrected	Minor	Case Closed
13211 Touchstone Cir., Woodbridge, VA 22192	8/18/2016	Trash and spilling waste oil & grease on pavement	9/19/2016	The deficiencies gradually minimized after public outreach with education materials	Major	Case Closed
14720 Lee Hwy Gainesville, VA 20155	9/2/2016	Spilling waste oil & grease on pavement	10/3/2016	The deficiencies were found to be corrected.	Major	Case Closed
6990 Heritage Village Plaza Gainesville, VA 20155	9/2/2016	Spilling waste oil & grease on pavements potential for being washed away into storm sewer system	10/3/2016	The deficiencies were found to be corrected.	Minor	Case Closed
7441 Somerset Crossing Drive Gainesville, VA 20155	9/2/2016	Iron stain observed around dumpster on pavement and directed towards storm sewer system	10/5/2016	Outreach made with the business owner to stop dumping metalic waste on out of roof open container, deficiencies found to be corrected.	Major	Case Closed
3900 Fettler Park Dr Dumfries, VA 22025	9/9/2016	Iron stain observed around dumpster on pavement and directed towards storm sewer system	10/11/2016	Outreach made with the business owner to stop dumping metalic waste on out of roof open container, deficiencies found to be corrected.	Minor	Case Closed
14142 Smoketown Rd, Woodbridge,VA 22192	9/20/2016	Iron stain observed around dumpster on pavement and directed towards storm sewer system	10/24/2016	Outreach made with the business owner to stop dumping metalic waste on out of roof open container, deficiencies found to be corrected.	Minor	Case Closed
13040 Worth Ave, Woodbridge, VA 22192	9/27/2016	Waste cooking oil stain was observed towards storm drain system	10/31/2016	Outreach made with the business owner to stop dumping metalic waste on out of roof open container, deficiencies found to be corrected.	Minor	Case Closed

BMP 2 – Sanitary Sewer Exfiltration Abatement Program

Prince William County contains a mix of sanitary sewer systems and septic fields within its jurisdiction. The sanitary sewer system is maintained, and operated by the Prince William County Sanitary Sewer Service Authority (PWCSA) and Virginia American Water (formally Dale

Services Corporation), both which operate under their own VPDES permit. Prince William County is not responsible for the inspection and maintenance of the sanitary sewer system; however, PWC works closely with the PWCSA to identify and correct deficiencies within the sanitary sewer network. Prince William County Service Authority has an ongoing program, the infiltration and inflow check program, for identifying and correcting defects in the County's sanitary sewer systems, such as:

- Performing detailed engineering studies to locate defects in the gravity sewer system and recommend corrective action.

- Preparing construction documents for repair of the identified defects.

- Constructing necessary improvements.

The identification and correction of deficiencies is aided by Prince William County through its Dry Weather Monitoring, Storm sewer Maintenance, General Stormwater Discharge, and Stream Restoration Programs. Cross connections, leaks, and other maintenance issues are discovered as non-stormwater discharges within the storm sewer network through the County's Dry Weather Monitoring and Storm sewer Maintenance Programs. Citizens can report leaks and cross connections discovered discharging through the storm sewer system through the County's General Discharge program. Sanitary sewer infrastructure exposed to potential damage as a result of degrading streams and waterways are protected through projects associated with the County's Stream Restoration Program. Prince William County continues to identify and report concerns to the PWCSA when sanitary sewer system maintenance and repairs are needed. The PWCSA oversees all new construction on sanitary sewer system components and is responsible for the proper installation and operation of the system.

Prince William County is actively working on establishing working relationships with Virginia American Water with regards to their Infiltration and Inflow Program as well as with all Phase II MS-4 systems within the County's Jurisdictional area.

The Prince William Health District is responsible for the oversight and regulation of certain sewage and water environmental health issues within Prince William County. The Health department oversees the permitting and inspection of septic systems. The Health District inspects and permits septic systems and requires onsite sewage disposal systems not requiring a Virginia Pollution Discharge Elimination System (VPDES) permit shall have pump-out accomplished at least once every five years. The Heath District also provides valuable public outreach to septic system owners, including information on septic system maintenance.

BMP 3 – Reduce the Discharge of Floatables

.The Adopt-A-Spot program is a litter cleanup and recycling program sponsored by the Virginia Department of Waste Management. The Prince William County Soil & Water Conservation District (SWCD) undertakes stream cleanups under their Adopt-A-Stream program. Some stream clean-ups are done on an individual occasion basis rather than an on-going project, and these sites

are often done for specific programs or purposes (Alice Ferguson Foundation, Earth Day, etc.). Adoptable areas under this program include parks, schools, vacant land and neglected public areas. Stream sites are located in the various sub-watersheds in Prince William County and some of cleaned up more than once per year.

The locations selected for the Adopt-A-Stream (AAS) clean-ups are selected from mainly public or park riparian properties, which have experienced historical problems with trash accumulation or have had specific problems in the past. Some private sites are also found in the areas. A list of potential sites is also maintained for future clean-up sites. This program not only identifies locations where floatables and trash are a concern in the County. It follows that assessment with a volunteer cleanup, which temporarily removes the trash and debris. The County's Litter Control and landfill personnel also provide assistance with picking and weighing of the trash after a cleanup to document the amount of trash removed from the site. If the cleanup is included in the AAS program, periodic clean-ups on a biannual or annual basis are conducted, thereby revisiting sites to see if the floatables condition has improved over time. PWSWCD also administers the County's Floatables Monitoring Program. This program is designed to assess refuse loading to 5 selected stream sites throughout the County. More information on this program can be found in section II.3.

Prince William County, in coordination with the Keep Prince William Beautiful (KPWB) Organization, Developed a program dedicated to the labeling of storm drains throughout the County. These labels identify a storm drain as discharging to the Chesapeake Bay, as well as remind citizens not to dump items, fluids, etc., down the storm drain. Included in this program will be public outreach initiatives focused on eliminating illicit discharge and litter. KPWB partners with local volunteers to complete program objectives, involving local citizens and providing educational services. KPWB partnered with volunteers to label 825 storm drains in FY17, and reached 8,327 citizens through public outreach events.

Public Works has established a Litter Control Crew to pick up highly traveled roadways of the county, handle cleanups of illegal dumpsites and haul material from community clean up events. In FY17, the Litter Control Crew picked up over 170 tons of trash and debris. Public Works also provides funding to Prince William Soil and Water Conservation District and Keep Prince William Beautiful to lead volunteers in cleaning up litter at designated locations and along streams.

- Residents
  - Encourage residents to use litter bags and dispose of waste properly through messages on web site, local government channel and through partner agencies
  - Offer community "dumpster days" where residents can drop off unwanted items from their home
  - Recruit residents to adopt a stream through the Prince William Soil and Water Conservation District (in FY17, 561 volunteers donated 2,468 hours of time to clean 29,217 pounds of trash from 72.50 miles of stream)
  - Recruit residents to participate in floatables monitoring conducted by the Prince William Soil and Water Conservation District (14 volunteers

monitored five sites for 23.5 hours and pulled 70 pounds of floatables along 340 feet of streams connecting outfalls to rivers)
        - Recruit residents to adopt a spot or participate in an organized cleanup event sponsored by Keep Prince William Beautiful (volunteers participated in 302 community cleanups)
        - Conduct litter survey four times a year
        - Enforce anti-littering laws
        - Ask community to report illegal dump sites so we can send Litter Control Crew out to clean them up
        - Pick up litter along highly traveled roadways on a regular annual schedule
        - Pick up trash and debris from community volunteer cleanups at a designated location after the event
        - Enforce property code requirements to eliminate dump heaps, overgrown grass and unkempt structures on residential properties

    - Businesses and Industries
        - Encourage businesses and industries to provide volunteers to clean up community
        - Enforce property code requirements to eliminate dump heaps, overgrown grass and unkempt structures on commercial properties

BMP 4 – Proper Disposal of Wastes

Working with our partners, Prince William County Public Works will promote, publicize and facilitate the proper management and disposal of used oil and household hazardous waste.

Public Works has created and maintains a robust management program for the collection and disposal of household hazardous waste and collection and recycling of used oil

    - Residents
        - Offer twice a week collection of household hazardous waste (including all oils and petroleum products) and electronics year-round at the County Landfill and once a month at the Balls Ford Road Compost Facility (in FY17, 23,559 citizens delivered 101.55 tons of household hazardous waste and electronics to our County Landfill and Balls Ford Road Compost Facility)
        - Built a safe building for residents to drop off household hazardous waste and electronics with proper storage as needed
        - Offer daily collection of used motor oil and antifreeze
        - Provide useful signs to direct residents on how to properly dispose of these materials when they arrive at the landfill and compost facility

- Provide clear and complete information about managing, storing and bring household hazardous waste to the County landfill and compost facility through brochures and instruction sheets, web pages, public service announcements and newsletters
- Host an annual special event at the County landfill for Prince William Recycles Day to share information on handling household hazardous waste and recycling used oil (Nearly 1,000 participants in October 2016)

Future efforts: Create an online system for residents that captures the typical products and materials used by residents and how to properly dispose of them

- Businesses and Industries
  - Do not accept hazardous waste or oils from commercial businesses
  - Offer a list of companies they can contact for assistance when they call or visit the County website

Future efforts: The online system created for residents will also be a useful reference for business and industry managers

- County Government
  - Provide extensive training on the proper handling and disposal of chemicals and potentially hazardous materials
  - Reviewing current chemicals used and seeking safer alternatives
  - Provide extensive training on how to respond and report a chemical spill
  - Established an effective program for handling motor oil, antifreeze and other vehicle fluids at the Fleet Maintenance Shop
  - Conducted an inventory of chemicals in use by County agencies and arranged a collection of no longer used products with a licensed handler
  - Piloting a program to collect chemicals from agencies and work with County contractor to accept them at designated intervals throughout the year

Future Efforts: Produce a preferred chemical list to reduce the use of potentially hazardous and harsh products

The following summarizes the County's solid waste, household hazardous waste, and recycling programs for FY17:

PRINCE WILLIAM COUNTY
SANITARY LANDFILL
MONTHLY OPERATIONS REPORT

8/21/2017

FY17	OTHER REFUSE							TOTAL REFUSE TO LANDFILL	TIRES		TOTAL MONTHLY REVENUE
	KEEP PW B'FUL TONS	"Overs" B.F. TONS	INCIN. ASH TONS	SPECIAL PICK-UPS TONS	CONTAM. SOIL TONS	REFUSE FROM B.F. TONS	COUNTY ROAD CL-UP TONS	TONS	TONS	REVENUE	
Jul-16	2.67	2,035.62	68.98	-	-	551.88	-	39,682.30	131.92	$ 10,350.00	$ 152,488.40
Aug-16	4.62	55.34	86.31	-	-	482.06	-	36,566.35	132.56	$ 12,105.00	$ 170,468.23
Sep-16	12.32	198.10	-	-	-	487.67	-	32,740.03	197.45	$ 15,130.00	$ 168,561.08
Oct-16	9.76	548.80	49.03	-	-	470.23	-	34,703.68	111.11	$ 16,347.70	$ 168,189.80
Nov-16	0.97	1,335.22	155.55	-	-	443.19	-	33,022.68	214.96	$ 11,921.00	$ 152,901.28
Dec-16	-	487.72	106.75	-	-	394.46	-	31,049.82	117.97	$ 11,790.00	$ 147,323.15
Jan-17	0.36	474.36	162.95	-	-	391.80	-	30,526.68	193.57	$ 18,505.00	$ 159,351.45
Feb-17	-	-	-	-	-	437.71	-	38,389.19	97.70	$ 11,498.00	$ 124,026.70
Mar-17	3.07	-	163.47	-	-	456.94	-	39,747.85	147.08	$ 14,721.85	$ 194,134.80
Apr-17	37.39	346.10	227.32	-	-	586.80	-	41,764.60	173.17	$ 19,283.95	$ 203,467.01
May-17	31.98	548.49	-	-	-	569.56	-	46,469.22	164.09	$ 19,613.20	$ 199,273.38
Jun-17	35.25	71.20	-	-	-	621.60	-	42,899.97	219.80	$ 17,430.40	$ 179,399.10
TOTAL	138.39	6,100.95	1,020.36	-	-	5,893.90	-	447,562.37	1,901.38	$ 178,696.10	$ 2,019,584.38

Figure 1 – PWC Landfill Refuse Reduction Statistics for FY17

PRINCE WILLIAM COUNTY
RECYCLING
MONTHLY OPERATIONS REPORT
PRINCE WILLIAM COUNTY - *ONLY*

FY17	CO-MINGLED	TEXTILES OUT		DONATION PLACE OUT	USED OIL L.F. OUT	USED OIL B.F. OUT		CAR BATTERIES L.F. OUT	CAR BATTERIES B.F. OUT		ANTIFREEZE L.F. OUT	ANTIFREEZE B.F. OUT	NPR REC. REVENUE	RECYCLE AMERICA REVENUE	RENT From NPR	Residue from Recycling Building
MONTH	TONS	TONS	REVENUE		GALLONS	GALLONS	REVENUE	NO.	NO.	REVENUE	GALLONS	GALLONS			REV.	TONS
Jul-16	0.00	0.00	$0.00	10.94	2,477	853	$ (666.00)	207	47	$ 1,586.90	565	67	$ -	$ -	$ 7,894.30	19.42
Aug-16	0.00	1.42	$0.00	21.40	5,130	585	$ (1,226.24)	176	75	$ 1,498.00	200	74	$ -	$ -	$ 7,894.30	10.73
Sep-16	0.00	0.40	$0.00	19.72	4,277	1,453	$ (1,220.34)	194	42	$ 1,413.90	-	80	$ -	$ -	$ 4,597.72	8.71
Oct-16	0.00	0.52	$0.00	0.00	5,183	890	$ (1,415.78)	160	44	$ 1,458.30	-	58	$ -	$ -	$ -	8.02
Nov-16	0.00	0.00	$0.00	0.00	3,576	1,119	$ (1,368.04)	155	32	$ 1,122.70	692	52	$ -	$ -	$ -	6.96
Dec-16	0.00	0.00	$0.00	0.00	3,105	801	$ (873.18)	134	35	$ 1,066.00	-	44	$ -	$ -	$ -	-
Jan-17	0.00	0.00	$0.00	0.00	2,842	637	$ (1,031.84)	106	48	$ 948.20	542	49	$ -	$ -	$ -	-
Feb-17	0.00	0.00	$0.00	0.00	4,509	773	$ (1,290.62)	131	48	$ 777.10	-	68	$ -	$ -	$ 7,894.30	-
Mar-17	0.00	0.00	$0.00	0.00	4,879	881	$ (1,654.20)	169	34	$ 855.00	455	24	$ -	$ -	$ -	-
Apr-17	0.00	0.00	$0.00	0.00	4,142	1,677	$ (2,401.35)	198	41	$ 1,127.50	-	89	$ -	$ -	$ -	-
May-17	0.00	0.47	$0.00	23.17	5,005	1,258	$ (1,674.70)	185	87	$ 1,397.60	387	75	$ -	$ -	$ -	-
Jun-17	0.00	0.99	$0.00	23.60	6,334	1,959	$ (2,078.86)	184	47	$ 1,521.30	627	72	$ -	$ -	$ -	-
TOTAL	0.00	3.80	$0.00	98.83	51,459	12,886	$ (16,901.15)	1,999	580	$ 14,772.50	3,468	752	$ -	$ -	$ 28,280.62	53.84

World Trade

Figure 2 – PWC Landfill Recycling Statistics for FY17

PRINCE WILLIAM COUNTY
RECYCLING
ALL RECYCLING

8/21/2017

PAGE 1 OF 1

FY17	NEWSPAPER TO NPR FROM PWC Facilities	NEWSPAPER TO NPR FROM All Others	CARDBOARD TO NPR FROM PWC Facilities	CARDBOARD TO NPR FROM All Others	(incl. paper rolls) MIXED PAPER TO NPR FROM PWC Facilities	MIXED PAPER TO NPR FROM All Others	CO-MINGLED TO NPR FROM PWC Facilities	CO-MINGLED TO NPR FROM All Others	NEWS-PAPER TO Republic & American	CARD-BOARD TO Republic & American	MIXED PAPER TO Republic & American	CO-MINGLED TO Republic & American	TOTAL	DATE & SIGNATURE
MONTH	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	TONS	
Jul-16	5.09	-	32.17	193.43	20.56	467.80	-	-	4.44	6.28	8.37	51.71	789.85	
Aug-16	4.01	-	24.14	189.15	16.53	555.07	-	-	2.45	8.37	9.14	53.57	862.43	
Sep-16	5.52	-	23.20	113.14	13.77	265.48	-	-	3.68	7.36	6.73	45.02	483.90	
Oct-16	-	-	31.92	-	23.57	7.21	50.84	-	-	21.32	23.57	50.84	209.27	*9.46 tons
Nov-16	-	-	-	-	-	-	-	-	-	33.65	31.37	48.19	113.21	
Dec-16	-	-	-	-	-	-	-	-	2.79	33.71	30.90	57.62	125.02	
Jan-17	-	-	-	-	-	-	-	-	5.18	32.61	25.41	60.57	123.77	
Feb-17	-	-	-	-	-	-	-	-	-	33.30	31.50	45.84	110.64	
Mar-17	-	-	-	-	-	-	-	-	1.97	42.99	21.35	49.34	115.65	
Apr-17	-	-	-	-	-	-	-	-	8.09	32.71	22.54	45.82	109.16	
May-17	-	-	-	-	-	-	-	-	9.35	57.77	22.10	75.43	164.65	*14.74 tons
Jun-17	-	-	-	-	-	-	-	-	2.59	50.69	31.21	62.85	147.34	
TOTAL	14.62	-	111.43	495.72	74.43	1,295.56	50.84	-	40.54	360.76	264.19	646.80	3,354.89	

*tons of mixed paper collected at shred events but not sent to any of these destinations

Figure 3 – PWC Recycling Statistics for FY17 (cont.)

BMP 5 - Discharge Elimination Programs

Prince William County hosts several programs under its Illicit Discharge Detection and Elimination (IDDE) program dedicated to the detection, identification, and elimination of unauthorized discharges to its MS-4 system. These programs include the Dry Weather Monitoring, General Discharge, Wet Weather Monitoring, Service Authority's Inflow and Infiltration program, and Industrial and High Risk Monitoring Programs. For more information on these programs, including program background and reporting, see section II.3.1 water quality screening programs.

f. Spill Prevention and Response

BMP 1 – Coordination with FMO

The County's Department of Fire and Rescue is the lead County agency responsible for all aspects of spill response. Accordingly, the County has designated a full-time Hazardous Materials Officer. Prince William County participates in the Commonwealth Department of Emergency Management Services' regional Hazardous Materials response programs and maintains a National Incident Management System Type 1 HAZMAT Team for emergency response.

The County's Department of Fire & Rescue (DFR) responds to all complaints of hazardous spills and hazardous illicit discharge. If the complaints relate to sewage, the appropriate agency, such as, Prince William County Service Authority or the Virginia American Water will be contacted. The complaints on the malfunctioning septic systems and drain fields are referred to the County's Health Department. The County staff makes every effort to direct complaints to the appropriate agency as expeditiously as possible.

For this reporting period there were 74 instances of discharges impacting the MS-4 that were responded to by Prince William County's Department of Fire and Rescue.. Discharge Reports for these incidents will be included in Appendix F.

g. Industrial and High Risk Runoff

BMP 1 – Identify all Industrial and High Risk Dischargers

The monitoring of VPDES permitted areas of Prince William County is accomplished as part of the County's IDDE program. On a semi-annual basis, PWC examines lists provided by DEQ to assess new permitted facilities discharging to the County's storm sewer system along with their permit, and registration form. These facilities are then added to a GIS layer, and their outfalls identified for use in monitoring efforts. Outfalls are identified using a combination of facility registration statements, DMR reports, and GIS desktop analysis. During FY17 the County further defined the VPDES permitted facilities discharging into its MS-4. Having identified its MS-4 service area, a GIS desktop analysis was completed and Permittees that discharge into the County's MS-4 service area were identified. Maps of these facilities can be seen in Appendix G.

. Individual VPDES permitted facilities that may be considered high risk include municipal landfills; other treatment, storage, or disposal facilities for municipal waste; hazardous waste treatment, storage, disposal and recovery facilities; facilities that are subject to EPCRA Title III, Section 313. There are three of these facilities that discharge to the County's MS-4:

- Virginia Concrete Company Inc. – Gainesville
- Chase David D Residence
- Coverstone Apartments

The Prince William County Balls Ford Yard Waste Facility was removed from this list, as none of the parcel contains County MS4 service area..

High Risk and Industrial VPDES permitted facilities are found to be contributing significant pollutants to the storm sewer system will be referred to DEQ for compliance review. Table 10 below shows the VPDES facilities discharging into the County's MS-4 area.

In FY16, the County performed used GIS to analyze and generate a list of potential High Risk outfalls according to a probability of pollutant discharge. This probability takes in account an assumed potential for a discharge to occur, possible pollutant discharge effect according to the type of facility and its operations, and the potential for environmental damage according to the facilities proximity to environmentally sensitive areas. From this analysis, 518 outfalls were deemed as potentially High Risk. Over the next two fiscal years, the County will inspect each of these outfalls to produce a field-verified list. In addition, any outfalls found to be contributing a significant source of pollutants during routine Dry Weather Monitoring inspections will be added to this list and updated yearly.

Table 10 – VPDES Permitted Facilities that Discharge into the County's MS-4

	Permit No	Facility	Location Address 1	Type	Location City	Location Zip5	County Name	DMRs
1	VAR052243	234 Auto and Truck Salvage Limited Liability Co.	14843 Dumfries Rd	SWGP	Manassas	20112	Prince William County	TBD
2	VAR051949	Chemung Contracting Corporation - Gainesville	7201 Rail Line Ct	SWGP	Gainesville	22013	Prince William County	Semi-Annual
3	VAR052372	Swift Auto Recycling and Salvage, Inc	14832 Dumfries Rd	SWGP	Manassas	20112	Prince William County	TBD
4	VAG830458	Chase David D Residence	13734 Joyce Rd	Petrol	Woodbridge	22191	Prince William County	TBD
5	VAR051477	First Transit Incorporated	14700 Potomac Mills Rd	SWGP	Woodbridge	22192	Prince William County	Semi-Annual
6	VAR052115	Penny's Used Auto Parts	13059 Minnieville Rd	SWGP	Woodbridge	22192	Prince William County	TBD
7	VAR051639	Potomac Disposal Services of Virginia, LLC	9650 Hawkins Dr	SWGP	Manassas	20109	Prince William County	Semi-Annual
8	VAG830514	Coverstone Apartments	10900 Coverstone Dr	Petrol	Manassas	20109	Prince William County	TBD
9	VAG110100	Virginia Concrete Company Inc - Gainesville	7300 Rail Line Ct	Concrete	Gainesville	20156	Prince William County	TBD

BMP 2 – Develop Prioritized Schedule for Monitoring VPDES and High Risk Outfalls

Outfalls identified as VPDES and High Risk non-VPDES as described above are inspected according to specific protocols outlined in the Prince William County's IDDE Program. Outfall prioritization follows an iterative process that incorporates in-field observations. As outfalls are monitored under the County's Dry Weather Monitoring Program, those which are determined to have a high potential for pollutant discharge are identified as High Risk and added to the prioritized schedule the next time it is updated.

BMP 3 – Develop Program to Monitor VPDES and High Risk Outfalls

VPDES and High Risk outfalls are scheduled for inspection according to the methods described in BMP 2. Outfalls are monitored in accordance with the County's Dry Weather Monitoring Protocols. Facilities whose outfalls are found to discharge significant pollutant flows within 3 consecutive inspections (follow-up inspections are scheduled according to IDDE protocols) are referred to DEQ for compliance review (see BMP 6). Outfalls of VPDES permitted facilities are inspected once a year, while High Risk outfalls are inspected once a permit cycle (due to high volume).

During the reporting period PWC continued VPDES and high risk outfall inspections.No deficiencies were found as a result of these inspections. The County expects a renewed emphasis on these inspections in the upcoming fiscal year and expects to complete inspections on all VPDES and high Risk outfalls during the next two reporting periods. Outfalls associated with VPDES facilities are identified as below:

Table 11 – VPDES Outfalls

Number	Outfall ID	Facility
1	19796	Coverstone Apartments
2	49124	Chemung Contracting Corporation
3	49117	Chemung Contracting Corporation
4	49119	Chemung Contracting Corporation
5	49121	Chemung Contracting Corporation
6	53541	Chemung Contracting Corporation
7	46251	Chase David D Residence
8	46235	Chase David D Residence
9	46223	Chase David D Residence
10	46226	Chase David D Residence
11	29549	Chase David D Residence
12	46228	Chase David D Residence
13	46230	Chase David D Residence
14	46232	Chase David D Residence
15	46254	Chase David D Residence
16	47233	First Transit Inc

17	47271	First Transit Inc
18	35905	Potomac Disposal Services
19	35901	Potomac Disposal Services
20	35896	Potomac Disposal Services

In addition the County inspected 14 non-VPDES permitted high risk facility outfalls. This number is expected to increase over the next reporting period. All identified non-VPDES high risk facilities are expected to have associated outfalls inspected during the Permit Cycle.

BMP 4 – Obtain DMR Reports from VPDES Permitted Facilities

To comply with permit conditions, PWC requests Discharge Monitoring Reports (DMRs) from all applicable (non-exempt) VPDES permitted facilities that discharge into the County's MS-4. Prince William County may conduct additional monitoring, or may require the facility to conduct additional monitoring, of any stormwater discharges it believes may be a source of significant pollutant loadings. Facilities that discharge in to the County's MS-4 and do not provide the DMR's will be directed to DEQ for compliance review (BMP 6).

BMP 5 – Identify High Risk Dischargers Not Covered Under VPDES Program

As outfalls for facilities determined to have a high risk for pollutant discharge are inspected, those which do not fall under VPDES permitting requirements or Virginia State Water Control Law are identified. These facilities are included under the County's non-VPDES High Risk Designation.

Potential Non-VPDES High Risk facilities are identified, along with associated outfalls, through GIS desktop analysis. Using County land-use information land-uses that are identified to have a high potential for the discharge of pollutants are isolated. As with VPDES permitted facilities, a buffer is placed around a high risk parcel and the containing outfalls are identified. These outfalls are considered to be potentially High Risk outfalls. During Dry Weather Monitoring activities, outfalls determined to potentially contribute a significant source of pollutants to the storm sewer system are identified and added to the list of high-risk discharges. These outfalls are then added to the High Risk outfall prioritization (BMP 2) list the next time it is updated. As with VPDES permitted facilities, as the County's GIS based storm sewer layer is updated, the analysis of outfalls associated with High Risk facilities will be updated. The list of high-risk facilities can be found in Appendix G.

Outfalls from these facilities are included in the prioritized outfall inspection schedule described in BMP 2. Any facility found to be discharging significant pollutants to the storm sewer system will be required to adopt control measures to prevent these discharges from entering the County's MS-4 under appropriate regulatory ordinance, since they cannot be referred to DEQ for VPDES compliance review. If watershed staff cannot obtain access to facilities that fall under these conditions, assistance from the PWC Fire Marshal's office will be requested.

BMP 6 – Refer Facilities in Noncompliance to DEQ for Review

PWC is required to refer the following facilities to the Department of Environmental Quality, Northern Regional Office, for DEQ compliance review under the Virginia State Water Control Law:

- Facilities and operations having non-stormwater discharges that do not have coverage under an existing VPDES permit;
- Facilities and operations identified pursuant to 40 CFR Part 122.26(b)(14) with manufacturing, processing, or raw materials storage outside that do not have coverage under an existing VPDES industrial stormwater permit.
- Any VPDES industrial stormwater permit facility where there is evidence of significant pollutant loadings to the MS4.
- Facilities that do not submit signed copies of DMRs to the permittee as required under a VPDES industrial stormwater permit.

During the reporting period no facilities were deemed necessary to report to DEQ for compliance review.

h. Storm Sewer Infrastructure Management

BMP 1 – Identify MS-4 Service Area and Regulated Outfalls

An integral part of developing the County's Chesapeake Bay TMDL action plan is determining the MS-4 regulated area. Prince William County maintains a comprehensive GIS database of SWM facilities and its storm sewer system. Included in this system are approximately 609 miles of storm drainage easements, approximately 9,000 stormwater outfalls, and 1,962 private and publically maintained SWM facilities; however, not all these facilities are served by MS-4 regulated areas.

In June of 2016 the County established its MS4 service area. This included the Regulated Outfalls and their associated drainage area. Information for each outfall included the individual ID number, local watershed, HUC and receiving water, and latitude/longitude for each MS-4 structure. The number of pervious and impervious acres served by the MS-4 and treated by MS-4 controls were also identified and reported. Prince William County has a total regulated MS-4 area of 36,365 acres, with 9,087 acres of impervious and 27,278 acres of pervious area. DEQ has copies of the County's MS-4 Service area.

BMP 2 – Continue Inspection of Publicly Maintained SWM Facilities

Prince William County continues a program for the inspection and maintenance of SWM facilities maintained by the County. Publicly maintained facilities include those owned by HOA's and residential communities or by the County Board of Supervisors, and where basic maintenance responsibilities are performed by County staff. As of June 30, 2017 the County is responsible for the maintenance of approximately 947 facilities, most of which are dry ponds, wet ponds, infiltration trenches, or sand filter facilities. The County maintains a number of Bioretention and proprietary BMP facilities.

County Maintained SWM/BMP facilities are typically inspected under two scenarios; under the general inspection program which occurs once a year, or, as requested by an impacted property owner. Maintenance is prioritized by the severity of maintenance needs for the facility. Maintenance on publically maintained SWM facilities is performed by Prince William County Construction Services as necessary. All applicable permitting requirements will be met during maintenance activities.

During the reporting period, the County staff conducted 862 routine inspections and 19 re-inspections of publically maintained facilities. A list of these facilities and their inspection date are included in Appendix H.

BMP 3 – Continue Inspection of Privately Maintained SWM Facilities

The County has a program in place to inspect more than 20 percent of the privately maintained facilities annually and to pursue enforcement actions in instances where maintenance is needed. All privately maintained facilities will be inspected within the five year permit cycle. As of June 30, 2017 Prince William County encompasses approximately 1,015 privately maintained facilities. These facilities are comprised of dry ponds, wet ponds, constructed wetlands, bioretention facilities, proprietary stormwater inlet BMP facilities, underground storage facilities, infiltration trenches, and many more.

Facilities in compliance with maintenance requirements are scheduled for re-inspection during the following permit cycle. For facilities with deficiencies, the owner is provided with a detailed report outlining those deficiencies. If the deficiencies are not corrected within the time period allotted a second notice is given, and additional time is provided for repairs. If the facility is still not repaired, Prince William County Construction Services conducts maintenance on the facility and the facility owner is required to reimburse the County for expenses. Follow up inspections are performed to ensure maintenance requirements are followed. Facility owners are urged to self-report maintenance activities to the County in the form of a detailed engineering report.

Before a privately maintained facility can be removed from bond, maintenance agreement must be recorded to ensure the proper upkeep of the facility. A majority of the privately-maintained SWM facilities have duly-recorded Maintenance Agreements that requires the owner to perform the inspection and maintenance at a frequency identified in the Agreement. For those facilities that do not have Maintenance Agreements, our County Attorney has determined that the maintenance note on the plan is still enforceable.

During the reporting period a total of 175 routine inspections and 63 re-inspections were conducted. Of those, 55 were found to be in compliance of the 120 that were in need of maintenance and are within the 60 or 30-day compliance periods. All facilities are expected to be brought into compliance. Table describing inspection, maintenance, and enforcement of privately maintained facilities for the reporting period along with a future inspection schedule can be found in Appendix H.

BMP 4 – Continue Inspection of MS-4 Storm Sewer System

Prince William County conducts routine inspection of its storm drainage system, inspecting 20% of the MS-4 annually. Storm sewer is inspected using visual inspection techniques, as well as using CCTV. The County continues to implement a program to inspect all new drainage systems (eligible for County maintenance) using video cameras, prior to accepting the systems into the County's maintenance program.

During the reporting period, the County conducted routine inspections on 198 miles of storm sewer during the reporting period.

BMP 5 – BMP/SWM Inventory

Prince William County maintains an inventory of all SWM/BMP facilities installed in the County. This list is updated as new facilities come on line, and old facilities are removed or retrofitted. This list includes the facility number, type, total acres treated, impervious acres treated, HUC code, State FIPS, and latitude/longitude and is included in an electronic form submitted with this document.

In addition, 150 facilities were added to the County's inventory during the reporting period. These facilities are listed below.

Table 12 – BMPs added to County Inventory in FY17

FAC ID	FAC TYPE	FAC DESC	DATE INVEN	MAINT	COMMENTS	SWM AGREE	VAHUC6	VAHUC12NAM	SUBD
700	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#105"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
701	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#75"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
702	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#74"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
703	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#71"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
704	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#72"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
705	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#73"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
706	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#69"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
707	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#68"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
708	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#67"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
709	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#70"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
710	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#90/#91"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
711	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#89"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
712	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#88"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
713	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#85"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
714	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#92"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
715	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#86"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
716	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#76"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
717	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#77A/B"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
718	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#84A/B"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
719	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#83"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
720	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#93"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
721	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#94"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
722	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#82"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
723	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#81A/B"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
724	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#101"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1

725	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#100"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
726	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#99"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
727	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#98"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
728	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#97"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
729	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#52"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
730	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#51"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
731	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#50"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
732	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#45"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
733	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#49"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
734	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#48"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
735	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#47"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
736	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#46"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
737	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#44"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
738	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#38"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
739	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#40"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
740	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#29"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
741	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#20"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
742	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#19"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
743	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#16"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
744	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#15"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
745	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#28"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
746	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#27"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
747	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#26"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
748	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#25"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
749	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#24"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
750	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#22"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
751	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#23"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1

752	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#18"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
753	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#14"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
754	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#10"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
755	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#12"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
756	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#13"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
757	BMP	B	5/4/2017	P	RAIN GARDEN, 4" PERF UNDERDRAIN, "#106"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
758	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#107"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
759	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#108"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
760	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#109"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
761	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#104"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
762	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#43"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
763	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#42A/B"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
764	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#17"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
765	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#96"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
766	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#103"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
767	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#110"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
768	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#111"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
769	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#112"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
770	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#113"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
771	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#114"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
772	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#115"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
773	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#116"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
774	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#117"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
775	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#7"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
776	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#11"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
777	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#9"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
778	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#8"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1

779	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#2"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
780	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#3"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
781	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#4"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
782	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#5"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
783	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#6"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
784	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#102"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
785	BMP	B	5/4/2017	P	RAIN GARDEN, 6" PERF UNDERDRAIN, "#1"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
786	SWMP/BMP	D	5/4/2017	P	3" BMP ORIFICE AT EW, POND "A"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
787	SWMP/BMP	D	5/4/2017	P	3" BMP ORIFICE AT EW, POND "C"	N	PL32	Broad Run-Catletts Branch	HOPEWELLS LANDING SECTION 1
788	SWMP/BMP	W	6/26/2017	P	PWSE=60.10', 10'x10' RISER W/ SLUICE GATE	N	PL49	Neabsco Creek	THE VILLAGES AT RIPPON LODGE FREESTONE POINT
951	SWMP/BMP	D	9/12/2016	P	64"x64" RISER, 1.75 BMP ORIFICE AT RISER	N	PL34	Broad Run-Rocky Branch	DAWKINS RIDGE LANDBAY D
952	SWMP/BMP	D	9/12/2016	P	64"x64" RISER, 2" BMP ORIFICE AT RISER	N	PL34	Broad Run-Rocky Branch	DAWKINS RIDGE LANDBAY D
953	SWMP/BMP	D	9/15/2016	P	1.51" BMP ORIFICE AT RISER	N	PL51	Powells Creek	EWELL'S MILL ESTATES SECTION 2
954	SWMP/BMP	W	9/26/2016	P	PWSE=14.94', 5'x5' RISER W/ SLUICE GATE	N	PL51	Powells Creek	POWELLS LANDING SECTION 9
955	SWMP/BMP	D	10/11/2016	P	48"x57" RISER, 4.5" BMP ORIFICE AT RISER	N	PL48	Occoquan River-Belmont Bay	VANTAGE POINT SOUTH
956	SWMP/BMP	D	10/20/2016	P	2" BMP ORIFICE AT EW	N	PL43	Little Bull Run	DOMINION VALLEY COUNTRY CLUB SECTION 37
957	SWMP/BMP	D	10/27/2016	P	2.5" BMP ORIFICE AT EW	N	PL51	Powells Creek	YARBROUGH PROPERTY
958	SWMP/BMP	D	11/18/2016	P	12" ORIFICE AT RISER, ENHANCED POND	N	PL46	Lower Bull Run	RUDDLE PROPERTY
959	SWMP/BMP	D	11/18/2016	P	1.25" BMP ORIFICE AT RISER	N	PL46	Lower Bull Run	RUDDLE PROPERTY
960	SWMP/BMP	D	1/17/2017	P	1" BMP ORIFICE AT RISER	N	PL42	Upper Bull Run	FREEDOM TREE SERVICE
961	SWMP/BMP	D	2/16/2017	P	2" BMP ORIFICE AT RISER	N	PL32	Broad Run-Catletts Branch	WALNUT TREE FARM
962	SWMP/BMP	W	3/14/2017	P	PWSE=347.93', SLUICE GATE AT RISER	N	PL49	Neabsco Creek	HOADLY FOREST
963	SWMP/BMP	W	4/28/2017	P	PWSE=274.0', 10'x10' RISER W/ SLUICE GATE	N	PL34	Broad Run-Rocky Branch	GLENKIRK ESTATES POND 2
5891	CSWMP/BMP	U	3/9/2017	C	STORMTECH MC-4500 W/ 4 ISOLATOR CHAMBERS	Y	PL44	Middle Bull Run	OLD COMPTON ROAD, LLC (STORAGE YARD)
5992	CBMP	U	8/4/2016	C	8'x10'x48.5' BOX CULVERT STORMFILTER	Y	PL51	Powells Creek	FORTUNA RETAIL CENTER
5993	CBMP	U	8/4/2016	C	8'x10'x48.5' BOX CULVERT STORMFILTER	Y	PL52	Quantico Creek	FORTUNA RETAIL CENTER
5994	CBMP	U	8/4/2016	C	8'x10'x48.5' BOX CULVERT STORMFILTER	Y	PL52	Quantico Creek	FORTUNA RETAIL CENTER

5995	CSWMP/BMP	D	8/4/2016	C	5'x5' RISER, 3" BMP ORIFICE AT EW	Y	PL52	Quantico Creek	FORTUNA RETAIL CENTER
5996	CBMP	U	8/4/2016	C	STORMFILTER W/ HIGH FLOW BYPASS	Y	PL52	Quantico Creek	THE HAVEN AT FORTUNA VILLAGE
5997	CBMP	B	8/4/2016	C	BIORETENTION AREA, 4'x4' RISER W/ YI TOP	Y	PL52	Quantico Creek	THE HAVEN AT FORTUNA VILLAGE
5998	CBMP	U	8/4/2016	C	8'x11' STORMFILTER W/ HIGH FLOW BYPASS	Y	PL52	Quantico Creek	THE HAVEN AT FORTUNA VILLAGE
5999	CSWMP/BMP	D	8/4/2016	C	5'x5' RISER, 10" BMP ORIFICE AT RISER	Y	PL52	Quantico Creek	THE HAVEN AT FORTUNA VILLAGE
6000	CBMP	U	9/14/2016	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	AAA AT SUDLEY MANOR SQUARE
6001	CBMP	U	9/14/2016	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	AAA AT SUDLEY MANOR SQUARE
6002	CBMP	U	9/19/2016	C	FIRST DEFENSE VORTEX SEPARATOR	Y	PL44	Middle Bull Run	AUTOZONE AT SUDLEY MANOR SQUARE
6003	CSWMP/BMP	U	9/22/2016	C	4 PERF CMP CHAMBERS, 'INFILTRATION TRENCH'	Y	PL41	Occoquan River-Lake Jackson	HOADLY ROAD RETAIL CENTER
6004	CSWMP/BMP	D	9/22/2016	C	4" BMP ORIFICE AT EW	Y	PL41	Occoquan River-Lake Jackson	HOADLY ROAD RETAIL CENTER
6005	CSWMP/BMP	W	10/4/2016	C	PWSE=221.69', 6'x6' RISER W/ SLUICE GATE	Y	PL50	Potomac River-Occoquan Bay	KENSINGTON PLACE SWM PLAN
6006	CSWMP	U	10/11/2016	C	SWM VAULT W/ WEIR WALL	Y	PL48	Occoquan River-Belmont Bay	D.C.P. OFFICE BUILDING
6007	CSWMP/BMP	D	11/1/2016	C	9'x15' RISER; 6" BMP ORIFICE AT RISER	Y	PL49	Neabsco Creek	POTOMAC HEIGHTS
6008	CSWMP/BMP	W	11/4/2016	C	PWSE=130.20', 6'x6' RISER	Y	PL52	Quantico Creek	SOUTHPORT PIP
6009	CBMP	B	11/21/2016	C	RAIN GARDEN	Y	PL41	Occoquan River-Lake Jackson	HOLY FAMILY ACADEMY CAMPUS PLAN
6010	CSWMP/BMP	U	12/1/2016	C	STORMTECH SC-740 W/ 3 ISOLATOR CHAMBERS	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6011	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6012	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6013	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6014	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6015	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6016	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO
6017	CBMP	U	12/1/2016	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL49	Neabsco Creek	IGLESIA DE DIOS PENTECOSTAL PUERTA DEL CIELO

6018	CBMP	U	1/19/2017	C	STORMCEPTOR (STC 450i), NO ESMT	Y	PL32	Broad Run-Catletts Branch	THE FARM AT BROAD RUN
6019	CBMP	U	1/23/2017	C	CONTECH CDS2025	Y	PL50	Potomac River-Occoquan Bay	WOODBRIDGE STATION APARTMENTS
6020	CSWMP/BMP	T	1/23/2017	C	INFILTRATION TRENCH W/ PERF PIPE	Y	PL50	Potomac River-Occoquan Bay	WOODBRIDGE STATION APARTMENTS
6021	CBMP	U	3/3/2017	C	8'x11' STORMFILTER W/ WEIR WALL	Y	PL34	Broad Run-Rocky Branch	VIRGINIA TIRE & AUTO/WAWA OF BRISTOW
6022	CBMP	U	3/3/2017	C	8'x11' STORMFILTER W/ WEIR WALL	Y	PL34	Broad Run-Rocky Branch	VIRGINIA TIRE & AUTO/WAWA OF BRISTOW
6023	CSWMP/BMP	U	3/3/2017	C	6 CSP CHAMBERS W/ 2 MANIFOLDS	Y	PL34	Broad Run-Rocky Branch	VIRGINIA TIRE & AUTO/WAWA OF BRISTOW
6024	CBMP	B	3/7/2017	C	RAIN GARDEN	Y	PL50	Potomac River-Occoquan Bay	BB&T MARUMSCO PLAZA SHOPPING CENTER
6025	CBMP	U	3/20/2017	C	ADS WATER QUALITY UNIT	Y	PL49	Neabsco Creek	LINDSAY AUTOMOTIVE
6026	CSWMP/BMP	U	3/20/2017	C	STORMTECH MC-3500 W/ 4 ISOLATOR CHAMBERS	Y	PL49	Neabsco Creek	LINDSAY AUTOMOTIVE
6027	CSWMP/BMP	D	3/24/2017	C	2" BMP ORIFICE AT EW	N	PL49	Neabsco Creek	KING ELEMENTARY SCHOOL BUILDING ADDITIONS
6028	CBMP	U	5/2/2017	C	PERMEABLE PAVEMENT W/ 6" UNDERDRAINS	Y	PL50	Potomac River-Occoquan Bay	EXECUTIVE MOVING & STORAGE BUILDING ADDITIONS
6029	CBMP	U	5/2/2017	C	PERMEABLE PAVEMENT W/ 6" UNDERDRAINS	Y	PL50	Potomac River-Occoquan Bay	EXECUTIVE MOVING & STORAGE BUILDING ADDITIONS
6030	CBMP	U	6/16/2017	C	6'x8' STORMFILTER W/ WEIR WALL	Y	PL47	Occoquan River-Occoquan Reservoir	MCDONALD'S AT TACKETTS MILL
6031	CSWMP/BMP	U	6/19/2017	C	STORMTECH SC-740 W/ ISOLATOR CHAMBER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6032	CBMP	U	6/19/2017	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6033	CBMP	U	6/19/2017	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6034	CBMP	U	6/19/2017	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6035	CBMP	U	6/19/2017	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6036	CBMP	U	6/19/2017	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6037	CBMP	U	6/19/2017	C	ADS NYLOPLAST STORM-PURE FILTER	Y	PL34	Broad Run-Rocky Branch	GREENWICH PRESBYTERIAN CHURCH
6038	CBMP	U	6/28/2017	C	6'x4' FILTERRA	Y	PL47	Occoquan River-Occoquan Reservoir	THE GLEN PARCEL 7 (CHICK-FIL-A AT THE GLEN)

i. County Facilities

BMP 1 – Promote Good Housekeeping Practices for Municipal Facility Operations

Prince William County promotes good housekeeping practices throughout all its municipal facilities through its Environmental Management System (EMS) program and other methods. PWC Watershed Management in partnership with PWC Risk Management enforces good housekeeping at County municipal facilities. The EMS program promotes consistency and accountability in the method for addressing environmental concerns through the allocation of resources, assignment of responsibility and ongoing evaluation of practices, procedures, and processes. This program emphasizes objectives such as the identification and prevention of spills, hazardous material storage and removal, storage tank inspection and maintenance, waste disposal and recycling, proper equipment and material storage, and many other environmental good housekeeping practices.

The following list shows some of the public buildings or facilities that have either Extraordinary Environmental Enterprise (E-3/E-4) or LEED certification:

E4 – PWC Solid Waste Sanitary Landfill
E4 – PWC Balls Ford Road Recycling & Composting Facility
E3 – PWC Fleet Management Facility
E3 – PWC Environmental Services Operations Building
E3 – PWC Buildings & Grounds Central Supply and Print Shop
E3 – PWC Fire & Rescue
E2 – PWC Police
E2 – PWC Libraries
E2 – PWC Parks & Recreation

In addition to the EMS program, Prince William County promotes good housekeeping activities for parks and rec facilities. These facilities are inspected biennially, to ensure good housekeeping practices are being followed. This includes properly managing yard waste and grass clippings. Police and fire vehicles are required to be washed in an environmentally safe manner, allowing no wash water to enter storm drain systems. Most vehicles are washed in commercial car washing facilities. PWC Fleet Management has worked closely with Risk Management and Watershed Management to set up a system to prevent the leaking or spilling of vehicles on site waiting for maintenance.

Prince William County's storm drain labeling program targets high priority municipal facilities to maintain markings on storm drain inlets. This program not only labels inlets at high priority municipal facilities, but in multiple areas of the county including high-risk shopping centers and residential neighborhoods.

BMP 2 – Identify High Priority Municipal Facilities

The County operates many municipal facilities. Some, like the PWC landfill facility, are covered under their own VPDES permit for stormwater discharges. During this reporting period, the County assessed all municipal facilities within its MS4 service area, and evaluated their need for a SWPPP. High risk facilities include composting facilities, equipment storage and maintenance facilities, materials storage yards, pesticide storage facilities, public works yards, recycling facilities, salt storage facilities, solid waste handling and transfer facilities, and vehicle storage and

maintenance yards. The following four facilities have been identified as being high risk, and are currently developing a SWPPP:

Table 13 – High Priority Municipal Facilities

Facility Name	SWPPP Needed	SWPPP Developed
Fleet Administration	Yes	In Development
Ben Lomond Maintenance Building	Yes	In Development
Hellweg Maintenance Building	Yes	In Development
PWC Stadium Maintenance Building	Yes	In Development

BMP 3 – Develop SWPPPs for Selected High Priority Municipal Facilities

SWPPPs will include a site description that includes site map showing all outfalls, direction of flows, existing source controls, and receiving water bodies; a checklist of potential pollutants and pollutant sources; all potential non-stormwater discharges; a maintenance schedule for all source controls; policies and procedures implemented at the facility for source reduction; an inspection schedule to ensure source reduction controls are implemented and maintained properly; training schedules for facility employees; procedures for annual evaluations of the facility; dry weather monitoring procedures; and all modifications made as a result of a spill or release of pollutant. The status of SWPPP development at High Priority Municipal Facilities is presented in Table 13 located in the above section.

j. Public Education and Participation

Prince William County strives to share relevant and useful information with our community to help protect our local waterways and natural environment. We undertake a number of projects and special events to provide citizens with the opportunity to help in these goals. Public Works also partners with residents, businesses, other government agencies and organizations to advance our goals to protect and preserve natural resources.

BMP 1 – Promote Public Reporting and Recognition of Illicit Discharges

Prince William County Public Works offers information to define an illicit discharge, possible sources of pollutants that can enter our stormwater systems, how to prevent runoff and how to report incidents of improper dumping.

- Residents
  - Created several references on our website at various pages including Citizen Action, Storm Water Management, Illicit Discharge and Illegal Dumping and Participation in Clean Water Programs

- Established a hotline and email address to report illegal dumping into storm drains (Staff received, inspected and took action on 49 complaints through the hotline and email in FY17)
- Placed 800 informational markers at selected stormwater drains throughout the community and hand out information door hangers explaining the concerns with placing materials in the storm drain
- Created and continue to air a public service announcement video about preventing pollution that appears on the local government channel and the website at http://www.pwcgov.org/government/dept/publicworks/environment/pages/default.aspx
- Host displays for community at Prince William Recycles Day, Earth Day and Compost Awareness events

Future efforts: Create an online reporting system for illegal dumping, share information with neighborhood leaders and homeowner associations through newsletters and meetings, share information with residents through newsletters distributed by Board of County Supervisors, will place 1,000 markers on storm drains in FY18

- Businesses and Industries
  - Created a web page for businesses on ways to prevent pollution
  - Targeted Commercial Carpet Cleaners by sending an informational letter and placed a page on the website specifically targeting them
  - Targeting Lawn Care and Landscaping Services this fall including an informational letter and a specific page for them on the website
  - Staff carry informational materials when visiting sites in the field
  - Educational materials are sent with warning and violation letters

  Future efforts: Send letters and create pages for other targeted businesses and industries, create a special sign for industries that practice best management practices for them to display and seek opportunities to present information at industry meetings and educational events

- County Government
  - Created online training about illicit discharge and pollution prevention for employees (required for some and encouraged for others)
  - Conducted an inspection of County facilities to determine the need for a SWPPP, which also provided an opportunity to identify and implement best management practices
  - Established protocol for outdoor storage of equipment, materials and chemical
  - Expanded program for proper collection and disposal of batteries, universal waste, printer cartridges, electronic accessories, chemicals and hazardous waste generated by County employees

- Worked with an independent vendor to inspect and make repairs to all above-ground fuel storage tanks located at PWC facilities

Future efforts: Adopt a County policy on Illicit Discharge Detection and establish SWPPPS at identified high-risk facilities

BMP 2 - Continue to Promote Involvement in Local Water Quality Improvement Projects

Prince William County Public Works will continue to promote individual and group involvement in local water quality improvement initiatives including the promotion of local restoration and clean-up projects, programs groups, meetings and other opportunities for public involvement.

Public Works takes the lead on water quality improvement initiatives by facilitating projects and educational events, as well as providing funds to partner agencies in the community to support public involvement and awareness.

- Residents
  - Sponsor an annual Youth Conference on the Environment and Parent Symposium on a variety of Environmental Topics (we have hosted the event for 16 years and average 100 participants and 30 high school student leaders each year)
  - Sponsor Six Weeks to Make a Difference Conservation Projects for Families to participate in a weekly project from April through mid-May including projects to pick up litter, reforest areas and help along streams (we have undertaken projects for the past 10 years with an average of 30 volunteers at each of the six events)
  - Recognize volunteers, individuals and groups, with an annual Green Community Award (since 2014, we have recognized 40 individuals and 20 groups, as well as the family volunteers at the conservation projects)
  - Create and maintain educational web pages on sound practices around the home to prevent pollution and runoff, protecting streams, rivers and wetlands, planting native species, safeguarding trees, and managing waterfront property http://www.pwcgov.org/government/dept/publicworks/environment/pages/default.aspx
  - Create and maintain informational web pages on opportunities to help families volunteer, take steps to go green and reduce their impact on the environment, get outdoors and learn about conservation agencies in the community http://www.pwcgov.org/government/dept/publicworks/gogreen/pages/go-green.aspx

- Provide residents with the opportunity to drop off household hazardous waste and electronics twice a week year-round at no charge to reduce inclination to pour down the storm drain for convenience and cost savings (provide amount)
- Provide residents with the opportunity to drop off motor oil and anti-freeze at no charge every day to reduce inclination to pour down the storm drain for convenience and cost savings (provide amount)
- Provide funding to the Prince William Soil and Water Conservation District to run an Adopt-a-Stream program (in FY17, 561 volunteers donated 2,468 hours of time to clean 29,217 pounds of trash from 72.50 miles of stream)
- Provide funding to the Prince William Soil and Water Conservation District to monitor floatables in the community from January to June 2017 (14 volunteers monitored five sites for 23.5 hours and pulled 70 pounds of floatables along 340 feet of stream)
- Provide funding to the Prince William Soil and Water Conservation District to monitor water quality at 12 active sites and four sites to monitor E.coli (80 volunteers donated 177 hours)
- Provided funding to Keep Prince William Beautiful to work with volunteers to apply 800 adhesive markers to storm drains that remind residents that the drain leads to local waters and eventually the Chesapeake Bay
- Provide funding to Keep Prince William Beautiful to organize litter clean-ups throughout the community (302 organized community cleanups)
- Provide funding to the Virginia Tech Cooperative Extension Office to provide training for residents on a variety of environmental topics including horticulture, best lawn practices, natural resources and other lawn care recommendations (4,181 residents participated in the program with 83% of them adopting recommended water quality practices)
- Provide funding to the Virginia Tech Cooperative Extension office to offer assistance to homeowners, businesses and houses of faith to adopt an urban nutrient management plan (75 acres are under a plan)

Future efforts: Provide tips for inclusion in newsletters distributed by the Board of County Supervisors, place information in the County Neighborhood News newsletter distributed six times a year, and attend local festivals and farmer markets to distribute materials about illicit discharge and protecting water quality

- Businesses and Industry
  - Created a web page with tips on reducing the impact from businesses on local water quality and implementing best management practices
  - Work with local businesses to properly maintain their stormwater management ponds

- Work with local businesses to recruit volunteers to help with cleanup projects, particularly near their business or when companies have a corporate philosophy to volunteer in the community
- Recognize volunteers, individuals and groups, with an annual Green Community Award
- Provide funding to Keep Prince William Beautiful to conduct quarterly litter surveys in the community to identify problem areas then report back to nearby businesses to seek assistance in cleanups and managing potential sources of litter or runoff
- Provide funding to Keep Prince William Beautiful to conduct shopping center surveys and provide feedback to property manager to help them better maintain their center (22 shopping centers currently participate)

Future efforts: Provide sign for businesses to post that indicate they help protect local water quality

- County Government
  - Created online training for compliance with Resource Conservation and Recovery Act, Spill Prevention, Control and Countermeasure plans and Illicit Discharge Detection and Elimination
  - Increased overall rate of environmental training of all County personnel by over 50%
  - Created an Environmental Policy Statement
  - Established and continue a robust Environmental Management System that includes facilities awarded E2, E3, E4 and SP status by DEQ and an EMS Council that manages and expands the environmental compliance program
  - Host an annual Earth Day Festival for County Employees
  - Provide spill kits for all fuel tanks and generators at County facilities and train staff how to respond
  - Maintain compliant Spill Prevention, Control and Countermeasure plans for facilities when required and maintain training requirements for the program
  - While conducting audits to determine the need for SWPPPs at several County facilities, we were able to identify opportunities to improve housekeeping practices that will help protect water quality

Future efforts: Provide additional training and increase awareness about actions we can take as county employees to improve local water quality by implementing additional good housekeeping practices

BMP 3 – Promote Integrated Management Practice (IMP) Plans for Public and Private Golf courses

Prince William County Public Works will reach out to public and private golf courses located within the county that discharge to the permittee's MS4 that would encourage implementation of integrated management practice (IMP) plans and techniques to reduce runoff of fertilizers and pesticides.

Public Works has established a relationship with local golf course managers, particularly the public courses, to ensure they have the tools and knowledge to reduce the impact of their operations.

- Required all golf courses to have a current nutrient management plan
- Required all golf course managers to ensure staff is properly trained in IPM plans
- Required all golf course managers to ensure staff is trained in application techniques to reduce run off

Future efforts: Establish stronger working relationship with private golf course managers and send an annual letter to golf course managers regarding requirements for illicit discharge, pollution prevention and available resources to ensure they are within compliance of these initiatives.

BMP 4 - Continue to Promote Public Good Housekeeping Practices

Prince William County Public Works will promote and publicize good housekeeping practices including the proper disposal of pet waste, household yard waste and washing vehicles to minimize water quality impacts.

- Residents
  - Provide information online about picking up after your pets
  - Provide a pamphlet about picking up after your pets
  - County-owned compost facility accepts yard waste from residents for composting and mulching (product available for purchase from private vendor that operates the compost)
  - Provide tips and steps for grass cycling and composting at home
  - Host an annual event to highlight the benefits of composting and provide information to the community

  Future efforts: Ask local vets to share the pamphlet on picking up after pets, provide a roll of pet waste collection bags and a reminder note to pet stores, breeders and vets for them to give to new pet owners, provide separate collection of yard waste from residential homes

- Businesses and Industries
  - Lawn care and landscaping companies can pay to dispose of yard waste from residential and commercial projects
  - Lawn care and landscaping companies can pay to purchase mulch and compost

Future efforts: Plans are underway to add a food waste processing system at the compost facility

- Residents
  - Created a page on the website which encourages the use of commercial car washes, but provide details on how to wash the car at home
  - Provided tips on how to manage any spills or leaks of oil and auto fluids

  Future efforts: Work with local organizations that hold car washes as a fundraiser with tips to reduce soap entering storm drains at the various commercial locations used for the events

- County Government
  - Require all standard vehicles be washed at commercial facilities
  - Established protocol for properly washing non-standard vehicles and equipment in such a way as to prevent runoff

BMP 5 - Encourage Private Property Owners to Implement Voluntary Stormwater Management Techniques and/or Retrofits

Prince William County will continue to develop programs to encourage private property owners to implement voluntary stormwater management retrofits. Currently, the County partners with the Prince William County Soil and Water Conservation District to encourage private property owners to implement voluntary stormwater management retrofits through the Virginia Conservation Assistance Program. This program promotes cost share incentives for private property owners looking to implement BMPs. As part of this partnership, PWCSWCD looks to install at a minimum two voluntary retrofit projects per year. No retrofits were completed in FY17 but two VCAP projects have been approved and are under construction.

Prince William County helps private property owners implement voluntary stormwater management techniques and/or retrofits with strategies including protecting sensitive areas, reducing run off and saving trees.

- Residents
  - Created brochures and web pages for owners with waterfront property
  - Hosted a conference with information for owners with waterfront property
  - Created a brochure about the Chesapeake Bay Resource Protection Areas for distribution at events and site visits
  - Created a pamphlet on the benefits of rain gardens
  - Offer funding through the Virginia Conservation Assistance Program for non-agricultural lands to support best management practices to protect local water quality

        - Encourage residents to reduce turf on property and replace with native species and forested areas
    - Businesses and Industries
        - Encourage businesses and industries to replace turf areas with native species and forested areas to reduce use of herbicides and fertilizers, as well as reduce mowing costs
        - Offer funding through the Virginia Conservation Assistance Program for non-agricultural lands to support best management practices to protect local water quality
    - County Government
        - Establish a reforestation practice for all new County construction to leave as many mature trees as feasible, save soil for planting projects and replace disturbed areas with trees and native plants to save mowing costs and reduce use of fertilizers and herbicides
        - Establish meadows and gardens at County historic sites and public facilities
        - Undertake stream restoration projects
        - Retrofit existing stormwater management structures with improved structures and strategies during retrofits, repairs or maintenance

    Future efforts: Increase efforts to identify opportunities to use VCAP for residential, commercial or county projects

BMP 6 - Continue to Promote Commercial, institutional and Industrial Good Housekeeping Practices

Prince William County Public Works will share specific information and strategies with local groups of commercial, industrial, and institutional entities likely to have significant stormwater impacts, including illicit discharge and illegal dumping concerns.

- Businesses and Industries
    - Focused on Carpet Cleaning Businesses in the spring with a letter to owners and a new web page for businesses to take action
    - Reaching out this fall to Lawn and Landscaping Services with a letter to owners and a new web page
    - Offer an education program on Fats, Oils and Grease from food service establishments through the Prince William County Service Authority

Future efforts: Identifying industries for future education and awareness campaign

- County Government
    - Inspect facilities and areas at high risk for runoff to ensure best management practices in place

- Improve best management practices by continuous review and upgrades as needed
- Place spill kits and provide training for staff to use spill kits at all vulnerable locations
- Conduct regular inspections of our above ground tanks to ensure there are no leaks or spills
- Created protocol for staff and volunteers for safety when they find tanks, suspicious bottles/jars and oil/fluid spills during inspections and cleanups

Future efforts: Increase awareness of all staff to recognize potential spill hazards and report any spills or runoff to the proper staff

Prince William County Public Works posts a copy of this state permit on its web page no later than 30 days after the effective date of this state permit and continue to retain a copy of the permit online for the duration of this state permit.

- Public Works has posted a copy of the state permit on its Public Works web site within the County Government pwcgov.org website. It resides on our Environmental Services pages and has its own direct link from our navigational bar at: http://www.pwcgov.org/government/dept/publicworks/environment/pages/ms-4-permit.aspx
- A printed copy of the state permit is kept in our offices for any citizen to review upon request at our service counter.

k. Training

BMP 1 – Continue to Train Staff in the Recognition of Illicit Discharges and Good Housekeeping Practices

Prince William County Staff are trained in the recognition and reporting of Illicit Discharges as well as implementation of good housekeeping practices. Currently, appropriate staff are trained on basic good housekeeping, spill prevention, and illicit discharge prevention practices through EMS training. This training is conducted annually and is required for all staff including full time parks and rec staff.

During FY17, the County conducted additional in depth training on disposal of universal waste, illicit discharge prevention (vehicle/equipment washing, landscaping, and outdoor construction), and spill prevention and response. These trainings will be offered to all employees annually. Overall 955 employees attended these trainings in FY17. A copy of attendance numbers and descriptions of trainings can be seen below in Table 14. No specific dates for training are provided, as they are provided periodically in a classroom setting, as well as on demand through the County's online training system.

To increase focus on the reporting and recognition of Illicit Discharges, as well as an overview of good housekeeping practices, a new general training was introduced in FY17. A copy of this training can be seen in Appendix K.

Table 14 – Training Provided During FY17

Title	Course #	# Attended	Content
Chemical & Custodial Safety	EHS 411	242	Quarterly discussion with custodial staff, each with 3 focus topic: safety, wellness, and environmental compliance. Environmental topics include indoor and outdoor spill recognition and response, proper waste disposal procedures (regulated and non-regulated waste) and green chemical evaluation and use.
EMS Annual Training	EHS 440	94	This 60-minute course provides a refresher to VEEP participants on the various components of their Environmental Management System, including: training requirements, environmental impacts, regulatory compliance review, communication plans, and operational controls.
Environmental Regulation Overview	EHS 450	49	This 90-minute course is intended for personnel who manage or perform activities involving chemicals, fluorescent light bulbs, mechanical equipment, storage tanks and/or garbage and recycling. Background information will be provided and participants will learn how to ensure their facility meets applicable regulatory requirements. This course covers SPCC, RCRA, Chemical Disposal and Discharge, Watershed Protection, and an overview of the Environmental Management System.
RCRA for Generators	EHS 146	181	This course reviews the rules for the management of hazardous waste by generators. Subjects include waste identification, collecting wastes, storing wastes, required paperwork, waste shipments, and emergency planning relating to EPA hazardous wastes.
Spill Prevention and Response	EHS 401	113	Overview of methods for: preventing spills through regular tank and equipment checks; containing spills through the use of booms, absorbents, and storm drain barriers; reporting spills internally and to regulatory bodies, when necessary.
Watershed Protection / Illicit Discharge Prevention	EHS 451	276	Introduction to the importance and function of watersheds, regulations that protect them, and complying with local, state, and federal laws that prohibit illicit discharges
Watershed Illicit Discharge Prevention	EHS 460	788	Provides an overview of the impacts of stormwater runoff to a watershed, illicit discharges as defined under the County's MS4 permit, examples of illicit discharges and how to identify them, and reporting protocols.

BMP 2 – Continue to ensure pesticide and Herbicide Application Occurs in Accordance With Pesticide Control Board Regulations

All County staff and County contractors receive appropriate training in pesticide and herbicide application. These include staff of Parks and Recreation, as well as Environmental Services Mosquito and Forest Pest Management staff. All staff are required to stay current in applicable trainings and certifications.

BMP 3 – Continue to ensure County Staff are Trained and Certified in DEQ Stormwater, E&S, and Plan Review Courses

All our engineering staff who review E&S, SWM and VSMP plans are have…certifications. All our site inspectors and stormwater management facility inspectors have erosion and sediment control inspector and stormwater management inspector certifications .

BMP 4 – Continue to ensure Emergency Response Staff are Trained in Spill Response

All uniform personnel are trained to the hazmat first responder operations level. This training teaches spill control as a defensive manner. This training is regulated by 29 CFR 1910.120(q) and NFPA 472. The 80 HAZMAT technicians or specialists and 577 career personnel are required to be current in this training, including annual refresher training. During the reporting period, all required personnel were current in Emergency Spill Response training.

l. Water Quality Screening Programs

BMP 1 – Develop and Maintain a Dry Weather Monitoring Program

During the reporting period, Prince William County conducted 970 Dry weather Monitoring inspections. Of the 970 outfalls monitored, 114 (11.8%) outfalls were found to be flowing; 44 (4.5%) of the flowing outfalls were found to have groundwater as a source, 34 (3.5%) were found to have surface water as a source (piped streams), 22 (2.3%) of those were found to have other sources (Lawful discharges such as landscape irrigation, sump pump discharges, AC condensate, etc.), and 4 were found to be Illicit in nature. Two resulted in the issuance of an Notice of Violation. Descriptions of these discharges and of follow-up can be found below. Discharge reports for each instance can be found in Appendix L. As outfalls are screened through our dry weather monitoring program, those that are found to be contributing a significant load of pollutants are toggled as being high risk.

Table 15 – Dry Weather Monitoring Program Summary

Illicit Discharge - Dry Weather Monitoring - FY2017								
Outfall ID	**Related Name/ Company**	**Address**	**Date of initial inspection**	**Characteristics of discharge**	**NOV Issued**	**Date of last inspection**	**Comments**	**Status**
5757-0001	Homeowner	10021 Lomond Drive, Manassas, VA 20109	9/15/2016	Dark blue discharge with detergent	Yes	9/19/2016	Two different pipes were found connected from washer & dryer discharging grey water. The grey water pipes have been disconnected.	Case Closed
19640	Southside Oil LLC	3514 Old Bridge Rd	11/14/2016	Discharge with green color	Yes	2/10/2017	Car wash bay was connected to the storm sewer system. It has been reconnected into sanitary sewer.	Case Closed
31195	Winners Circle LLC	9220 Developers Drive	1/27/2017	White and cloudy discharge with colorful petroleum sheen.	No	3/13/2017	Commercial car washing draining into the storm sewer system. The manager agreed to immediately cease the activity. Follow up inspection made [3/13], deficiencies found to be corrected.	Case Closed
27640	Finley contracting company	7861 David Williams Way	3/22/2017	Petroleum odor, easily noticeable from debris being deposited at outfall.	No	4/21/2017	The source of petroleum odor identified a debris laden runoff into storm sewer system. Property owner agreed to clean up the mess.	Case Closed

All cases of Illicit Discharge were completed satisfactorily.

BMP 2 – Develop and Maintain a Wet Weather Screening Program

Prince William County's Wet Weather Screening Program began at the end of FY16, with first sample occurring in September of 2017. Two sites were selected for sampling and sampling will occur during qualifying storms on a quarterly basis.

The first year of sampling has shown multiple analytes exceeding water quality criteria. Figure 4, found below, summarizes the exceedances at both sites for FY17. The County has produced contributing drainage area maps for both sites, which can be found in Appendix L. In FY18 the

County will perform public outreach to businesses and HOAs in these areas in an effort to reduce pollutant loads. Dry weather monitoring will also occur in these areas in order to track down pollutant sources. Outfalls found with an active flow will have samples taken for additional analysis. If further analysis is needed of these samples, they will be sent to the Mooney Lab to further identify the types of pollutants. A description of site selection and final site locations, as well as Wet Weather Monitoring procedures and results are located in Appendix L.

Figure 4 – Exceedance tracking for the Wet Weather Monitoring Program

		2016		2017				2016		2017	
		Q3	Q4	Q1	Q2			Q3	Q4	Q1	Q2
Manassas (#941)	Copper	X	X	X	X	Dale City (#4684)	Copper	X		X	X
	Lead						Lead				
	Nickel						Nickel				
	Zinc	X		X	X		Zinc			X	
	Total Suspended Solids						Total Suspended Solids				
	Total Nitrogen						Total Nitrogen	X	X	X	X
	Phosphorus, Total						Phosphorus, Total				
	Chemical Oxygen Demand		X				Chemical Oxygen Demand				
	pH						pH		X		X

m. Infrastructure Coordination

BMP 1 – Implement Annual Coordination Meeting with VDOT

Prince William County met with VDOT on July 13th 2017. The main discussion involved comparing and contrasting the interconnectivity between VDOT and Prince William County's MS-4 Service area. VDOT and the County exchanged MS-4 Service Area maps in an effort to compare the service area delineations. Our consultant confirmed that VDOT's MS-4 service area maps were reviewed and taken into account prior to delineating County's MS-4 Service areas.

In addition to the discussion on MS-4 service area, VDOT and Prince William County shared procedures and contacts for the reporting of Illicit Discharges. The locations of water quality monitoring stations within the County were also shared.

Finally, we had preliminary discussions on TMDL action plan and implementation credits. The County has developed its TMDL action plan, but an understanding was made to look for potential projects where mutually beneficial outcomes could be made during the development process. VDOT shared details on its Means and Methods to achieve compliance with TMDL goals, as well as expressed areas where the County may be able to help with reaching those goals.

A sign in sheet showing members of the meeting is included in Appendix M. The County and VDOT plan to meet in FY18 in accordance with MS-4 permit requirements.

BMP 2 – Coordinate with VDOT on MS-4 Initiatives

During annual meetings with VDOT the County will discuss MS-4 interconnectivity issues such as:

Mapping – Status of mapping program and the ownership of MS-4 components

Chesapeake Bay TMDL – Means Methods and Schedule for reductions under the Chesapeake Bay TMDL special condition where impacts may occur to interconnected MS-4 areas.

Other TMDL Action Plans – Means Methods and Schedule for reductions under the other TMDL special conditions where impacts may occur to interconnected MS-4 areas.

TMDL Implementation Credit – Ensure BMP retrofits do not encounter double crediting. Discuss sharing of BMP credit if applicable.

Illicit Discharge – Share information pertaining to the County's IDDE program and coordinate with VDOT on the identification of high risk facilities. Establish procedures for reporting discharges identified from the VDOT MS-4 system.

Water Quality Monitoring – Discuss and present results of the County's water quality monitoring programs. This includes monitoring data collected from areas where the physically-interconnected MS-4 discharges to or flow is received from the VDOT MS-4.

II. Monitoring Requirements

1. Biological Stream Monitoring

Prince William County continued its Biological Monitoring Program in FY17 with its monitoring taking place in Q2 and Q4 of the reporting period. Sample collection occurred from October 4 to 6, 2016, and April 19 to 21, 2017 on five locations in Prince William County: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch. Benthic sampling was conducted in accordance with the Sampling Plan. The multiple habitat sampling method was used for each of the sites, consisting of a total of 20 jabs or kicks, taken from each major habitat type in the reach. Benthic macroinvertebrate samples were placed on ice in coolers and shipped overnight to Amec Foster Wheeler's benthic macroinvertebrate laboratory in Gainesville, Florida.

The RBP defines the following condition categories based on the physical habitat characterization scores, in an effort to determine the ability of the habitat to support an optimal biological community:

- **151-200 Optimal** - The physical habitat present meets natural expectations, and is capable of supporting an optimal benthic community.
- **101-150 Suboptimal** - Physical habitat is less than desirable, but satisfies expectations under most circumstances to support a benthic community.
- **51-100 Marginal** - Physical habitat has moderate levels of degradation, with a severity at frequent intervals throughout the reach, which limit the capability of supporting a benthic community.

- **0-50 Poor Physical** - habitat has been substantially altered with severe degradation to characteristics that would support a benthic community.

Table 16 below summarizes the results of the spring sampling session.

Table 16 – Fall 2016 Field Condition and Benthic Macroinvertebrate Results

Metric	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Assessment/ Characterization Score	104	147	110	136	87
RBP Habitat Condition Category	Marginal	Suboptimal	Marginal	Suboptimal	Suboptimal
Taxa Richness	11	16	25	15	26
Abundance	168	220	206	165	205
EPT Index	3	4	5	4	5
EPT/EPT+ Chironomidae	0.21	0.33	0.71	0.31	0.14
Percent Dominant Taxon	39.29	39.09	17.96	55.76	25.37
Percent Chironomidae	6.55	3.64	0.97	5.45	15.61
BI	5.42	6.06	5.91	6.01	5.67
BI Category	Good	Fair	Fair	Fair	Fair
PMA	57.74	41.82	37.38	62.42	63.78
PMA Category	Slightly Impacted	Moderately Impacted	Moderately Impacted	Slightly Impacted	Slightly Impacted
VSCI	36.54	49.42	56.59	39.44	57.34
VSCI Category	Severe Stress	Stress	Stress	Severe Stress	Stress

Measured field and laboratory water quality parameters are generally within the normal ranges for shallow, cool, turbulent, piedmont Virginia streams, and generally meet Virginia's Water Quality Standards, as outlined in Section 3. However, there were elevated *E. coli* levels at all of the sites, and three sites had levels above the Virginia Water Quality standard, which could be indicative of sewage or animal waste. In addition, the physical habitat assessments and biological evaluations indicated impaired habitats and stressed benthic macroinvertebrate communities.

The RBP physical habitat assessments that will be used as a baseline for subsequent monitoring indicated suboptimal habitats at all the sites, with the exception of Purcell Branch, which indicated marginal habitat. The "suboptimal" category indicates that the habitat criteria are less than desirable, but that the criteria satisfy expectations under most circumstances; the "marginal" category indicates a moderate level of degradation, with severity at frequent intervals throughout the reach that do not satisfy expectations.

Though the "suboptimal" habitat assessment rating indicated that four of the sites could support satisfactory benthic invertebrate communities under most circumstances, the benthic invertebrate

community measures showed that there was moderate to severe impairment to the benthos at all five sites, closer in agreement with the "marginal" category that was received for Purcell Branch. The results specified that though habitat assessments indicated the possibility of normal benthic communities at four of the five sites, the benthic communities present were found to be under stress or severe stress for all five sites. Based on the biological scores, the habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County.

Table 17 – Spring 2017 Field Condition and Benthic Macroinvertebrate Results

Metric	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Assessment/ Characterization Score	98	134	94	123	108
RBP Habitat Condition Category	Marginal	Suboptimal	Marginal	Suboptimal	Suboptimal
Taxa Richness	22	24	27	33	28
Abundance	161	190	193	161	167
EPT Index	3	5	2	6	4
EPT/EPT+ Chironomidae	0.14	0.09	0.08	0.22	0.03
Percent Dominant Taxon	42.24	47.37	28.50	17.39	26.95
Percent Chironomidae	43.48	61.05	57.51	51.55	68.26
BI	6.54	5.15	6.10	5.96	5.28
BI Category	Fairly Poor	Good	Fair	Fair	Good
PMA	37.42	50.79	49.33	48.91	39.67
PMA Category	Moderately Impacted	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted
VSCI	37.17	39.85	38.66	47.03	41.71
VSCI Category	Severe Stress	Severe Stress	Severe Stress	Stress	Severe Stress

Measured field and laboratory water quality parameters are generally within the normal ranges for shallow, cool, turbulent, piedmont Virginia streams, and generally meet Virginia's Water Quality Standards, as outlined in Section 3. However, the *E. coli* levels at Little Bull Run were above the Virginia Water Quality standard, which could be indicative of sewage or animal waste. In addition, the physical habitat assessments and biological evaluations indicated impaired habitats and stressed benthic macroinvertebrate communities among the sites.

The RBP physical habitat assessments that will be used as a baseline for subsequent monitoring indicated suboptimal habitats for Dawkins Branch, Neabsco Creek, and Purcell Branch, while Cow Branch and Little Bull Run indicated marginal habitats.

Though the "suboptimal" habitat assessment rating indicated that three of the sites could support satisfactory benthic invertebrate communities under most circumstances, the benthic invertebrate community measures showed that there was moderate to severe impairment to the benthos at the sites, closer in agreement with the "marginal" category, with the exception of Neabsco Creek which indicated stressed or moderately impacted communities. The results specified that though habitat assessments indicated the possibility of normal benthic communities at four of the five sites, the benthic communities present were found to be under stress or severe stress for all five sites. Based on the biological scores, the habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County.

In the assessment of measured field and laboratory water quality parameters, the fall 2016 (fall baseline) and spring 2017 sampling results are generally comparable to the spring baseline sampling results from 2016, are within the normal ranges, and are below Virginia's Water Quality Standards, with the exception of *E. coli* results. From spring to fall 2016, average *E. coli* results among the sites increased from 55.3 to 273.6 MPN/100mL, and went from no site exceedances to three of the five sites in excess of the Virginia Water Quality Standard of 126 MPN/100mL. From fall 2016 to spring 2017, the average results fell to 38.5 MPN/100mL, below the baseline average, but still had an exceedance at Little Bull Run.

A copy of the entire FY2017 sampling report, along with field data sheets and laboratory results can be seen in Appendix 1.

2. In-stream Monitoring

The County has maintained an in-stream water quality monitoring program for the past 25 years. In partnership with the Virginia Tech Occoquan Laboratory, the County maintains 5 in stream water quality stations, 2 stations (Little Bull Run and Neabsco Creek) have been in operation since the early 1990s, and the remaining three stations were put on line during FY16:

1. The "Dawkins Branch Station", with drainage to be comprised of older industrial and warehouse type of land uses. This station is to represent industrial land use in the County.

2. The "Cow Branch Station" with drainage area for the proposed station originating from commercial developments, such as, Potomac Mills Mall and several other commercial and residential uses along I-95 corridor. This represents a relatively high density and highly impervious area corridor.

3. The "Purcell Branch Station" was picked to represent large-acre residential lots, which is also a representative land use in the County.

4. Neabsco Creek at Delaney Rd. – Neabsco Creek is one of the most developed watersheds in the County. This station has drainage areas from several new and much older developments in Dale City area. Continuing this station will help us further establish the water quality trends for an older developed watershed.

5. Little Bull Run at Catharpin Road – Little Bull Run has drainage areas from major known developments such as Piedmont, Dominion Valley Country Club, etc. This Station represents the current development trends of well-planned subdivisions constructed with golf course amenities in the fast growing western part of the County. Continuing this station will help us further establish water quality trends.

a. Neabsco Creek Station

The Neabsco Creek water quality monitoring station has been in operation since 1990s. It is the County's longest running water quality monitoring station for instream monitoring.

Table 18 – Neabsco Creek Station Water Quality Results

DATE	FLO	TOTFLO	OP	TSP	TP	NH3_N	TKN	NO2_N	NO3_N	OX_N	COD	BOD5	TSS	FCOLI	ECOLI
	cfs	cubic feet	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	org/ 100mL	org/ 100mL
Sep-16	78.12	10,180,000	0.03	0.08	0.23	0.04	0.68	0.02	0.34	0.36	30.0	3.6	374	54000	27600
Nov-16	42.76	2,963,000	<0.01	0.02	0.06	<0.01	0.54	<0.01	<0.01	<0.01	25.4	6.4	14.8	790	1550
Mar-17	50.81	3,482,000	0.02	0.05	0.23	0.06	1.50	0.02	0.28	0.3	37.6	6.0	221	11000	7270

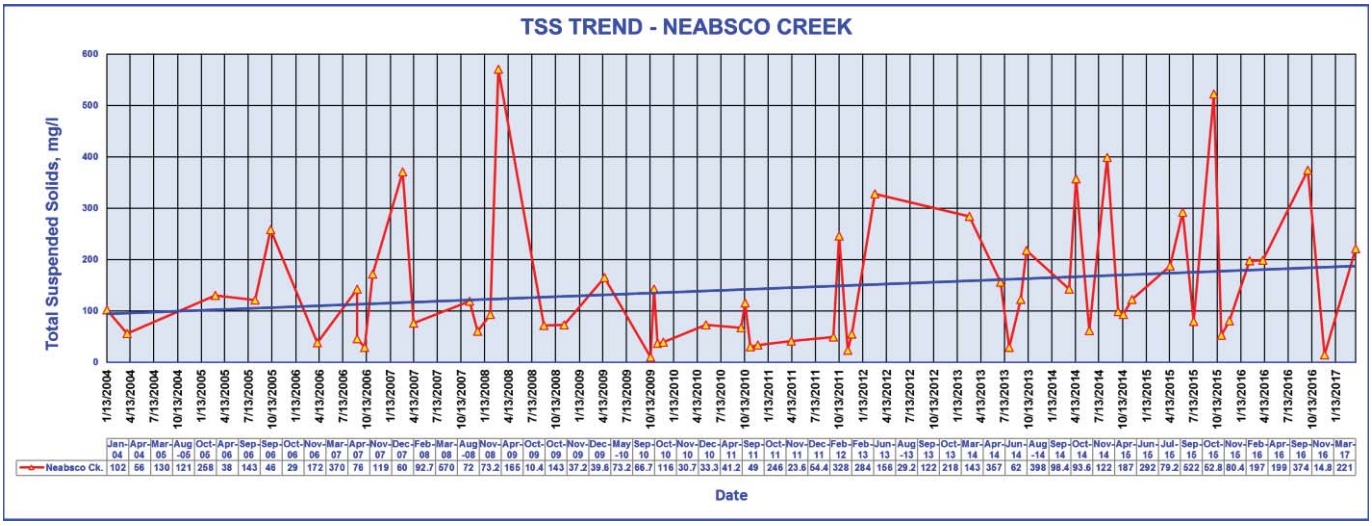


Figure 5 – Long Term TSS trends in Neabsco Creek Watershed

TSS samples show a slightly increasing trend in the Neabsco Creek Watershed.

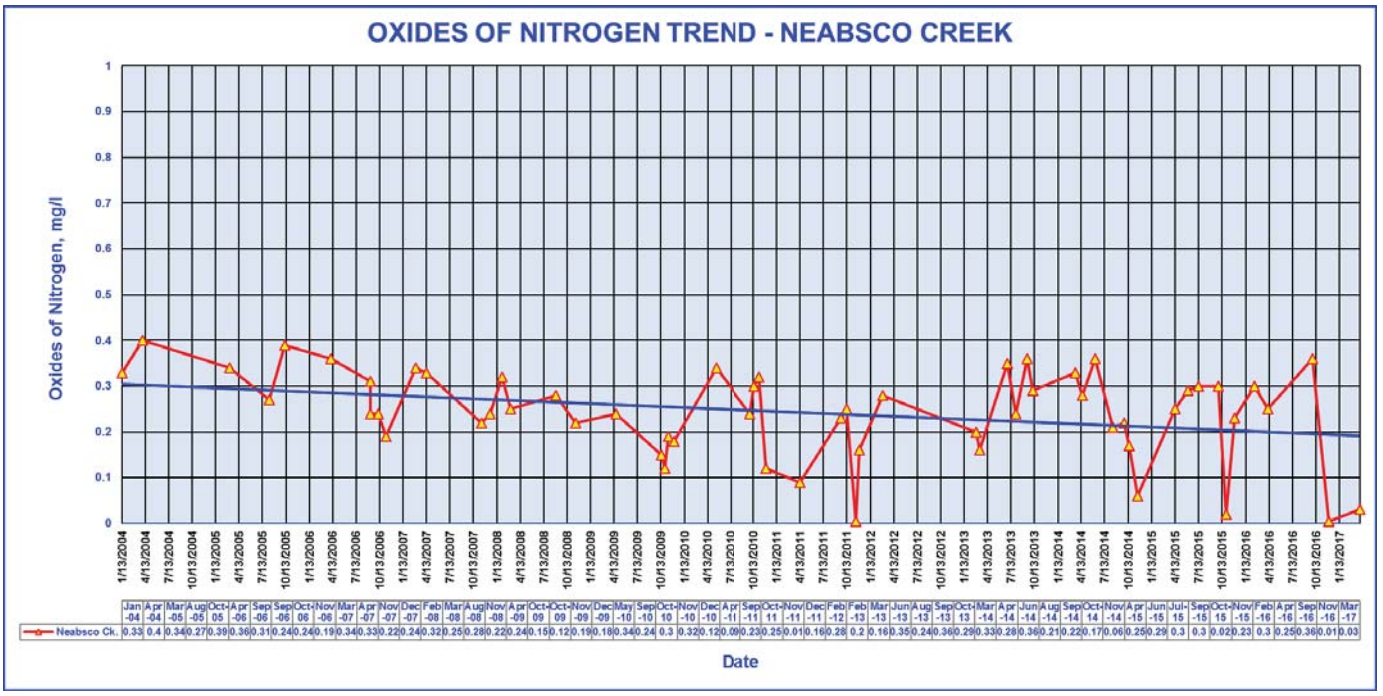


Figure 6 – Long Term TN trends in Neabsco Creek Watershed

Nitrogen is showing a decreasing trend within the Neabsco Creek Watershed. This can be interoperated that stormwater control measures are making an impact within the watershed; however, with increases in TSS it may not be the case. With stream restoration and other projects the County has undertaken, the County anticipates decline in TSS over time.

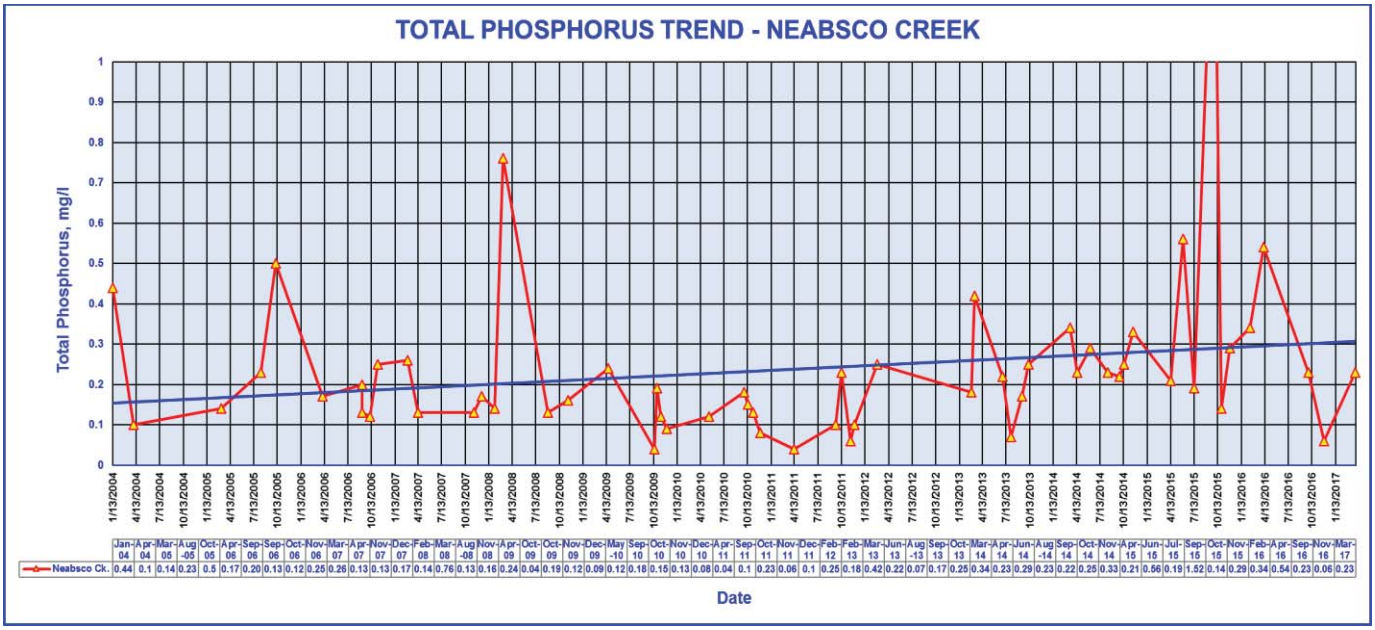


Figure 7 – Long Term TP trends in Neabsco Creek Watershed

Total Phosphorous shows an increasing trend within the Neabsco Creek Watershed. This data may be skewed more towards an increase due to several outlying peaks caused during large storm

events. However in this reporting period all samples yielded results lower than the rising trend.. With stream restoration and other projects the County has undertaken in the watershed, the County anticipates a decline in TSS, and consequently, a decline in phosphorous over time.

b. Little Bull Run

The Neabsco Creek water quality monitoring station has been in operation since 2007. It is the County's Second longest running in stream water quality monitoring station.

Table 19 – Little Bull Run Station Water Quality Results

DATE	FLO	TOTFLO	OP	TSP	TP	NH3_N	TKN	NO2_N	OX_N	COD	BOD5	TSS	FCOLI	ECOLI
	cfs	cubic feet	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	org/100 mL	org/100 mL
Sep-16	26.66	3,302,000	0.09	0.11	0.24	0.08	1.36	0.03	0.62	23.9	4.2	101	9200	5790
Nov-16	17.46	1,548,000	0.04	0.05	0.55	0.06	2.08	0.03	0.3	63.5	14.5	96	1300	1990
Mar-17	63.28	10,240,000	0.03	0.06	0.25	0.04	1.39	0.02	0.49	29.0	5.7	163	4900	3870

E.Coli shows improvement as compared to last year.

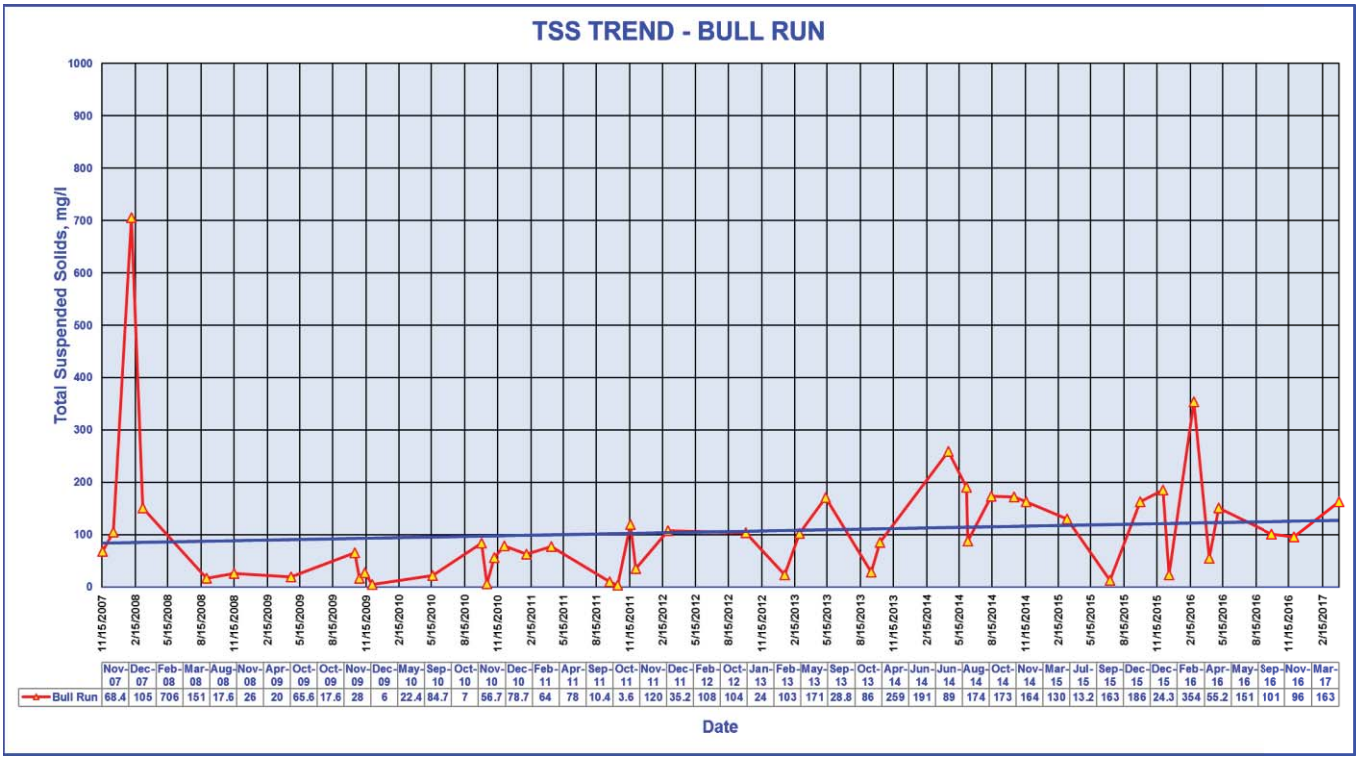


Figure 8 – Long Term TSS trends in the Bull Run Watershed

TSS in the Bull Run watershed trend is slightly increasing to steady. This year's results are consistent with this trend.

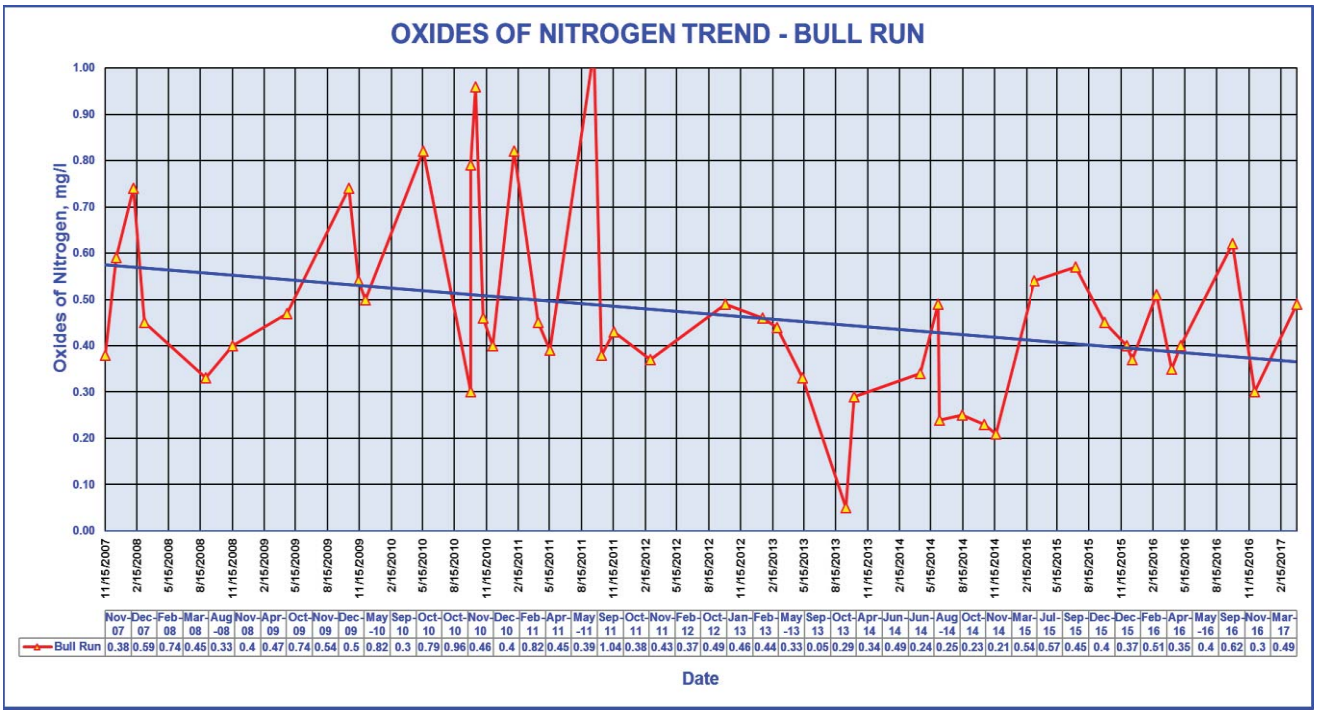


Figure 9 – Long Term TN trends in the Bull Run Watershed

As with the Neabsco Creek watershed, Oxides of nitrogen show a strong decreasing trend. This could indicate the effectiveness of stormwater controls, but as with Neabsco Creek, this trend is not reflected in concentrations of TSS.

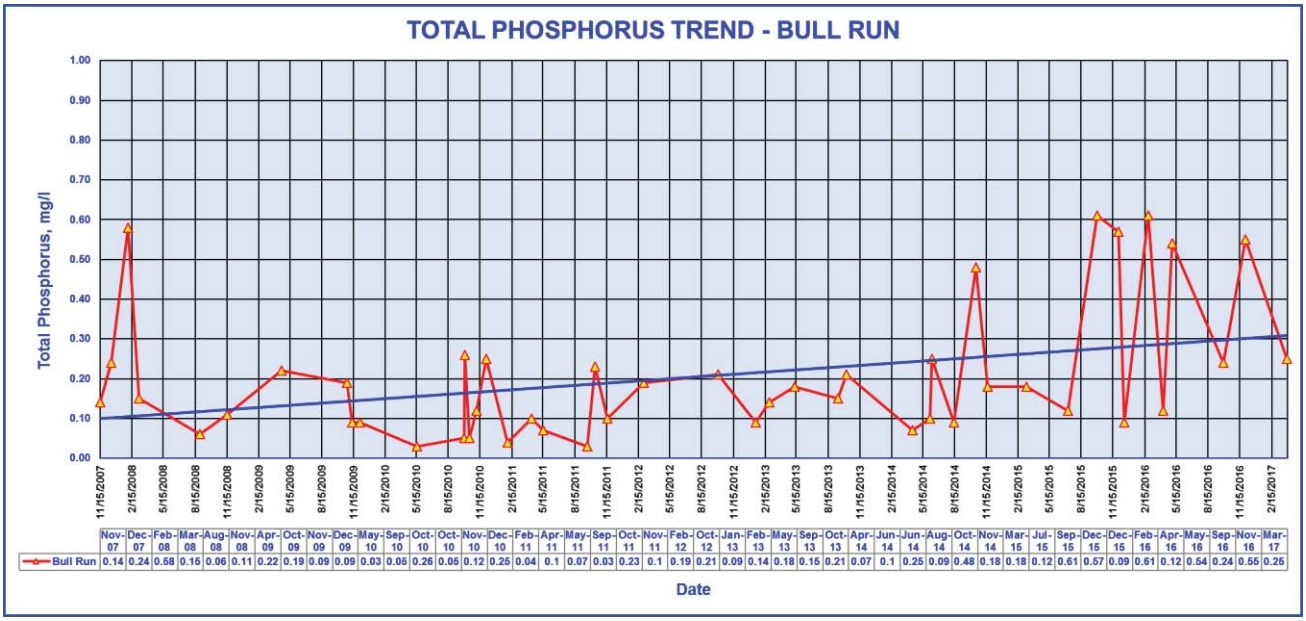


Figure 10 – Long Term TP trends in the Bull Run Watershed

TP has a strong increasing trend within the Bull Run watershed. The volatility observed in the Neabsco Creek watershed is again observed here. This seems to relate to increases in flow through the watershed due to storm events.

c. Dawkins Branch

The Dawkins Branch water quality monitoring station was installed during FY16 and produced four storm samples in FY17.

Table 20 – Dawkins Branch Water Quality Results

DATE	FLO	TOTFLO	OP	TSP	TP	NH3_N	TKN	NO2_N	OX_N	COD	BOD5	TSS	FCOLI	ECOLI
	cfs	cubic feet	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	org/100mL	org/100mL
16-Nov	4.1	204,500	0.04	0.05	0.09	0.03	0.86	0.01	0.29	29.4	7.4	24	2400	1990
16-Dec	12.2	866,900	<0.01	0.05	0.22	0.02	1.32	0.02	0.36	31.9	6.5	146	490	238
17-Mar	9.38	525,400	0.02	0.03	0.11	0.02	1	0.02	0.58	27.5	6.1	80.4	1700	1300
17-Apr	24.49	2,754,000	0.02	0.03	0.23	0.03	1.23	0.03	6.1	30.2	4.2	152	4600	4350

No long term trends analysis is available for this site as not enough data points are available. E.Coli counts are much lower than last year.

d. Cow Branch

The Cow Branch Water Quality Monitoring Station was installed during FY16, and produced 3 samples in FY17.

Table 21 – Cow Branch Water Quality Results

DATE	FLO	TOTFLO	OP	TSP	TP	NH3_N	TKN	NO2_N	OX_N	COD	BOD5	TSS	FCOLI	ECOLI
	cfs	cubic feet	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	org/100mL	org/100mL
Nov-16	9.55	323,300	0.02	0.03	0.10	0.01	0.9	0.02	0.28	31.1	8.8	40.5	1100	756
Dec-16	37.03	2,293,000	<0.01	0.02	0.18	0.01	0.99	0.01	0.21	29.4	6.3	88.0	460	517
Mar-17	23.37	2,117,000	0.02	0.02	0.16	0.06	1.03	0.01	0.35	35.8	4.9	153	4600	2420

No long term trends analysis is available for this site as not enough data points are available.

e. Purcell Branch

The Purcell Branch Water Quality Monitoring Station was installed during FY16. This station has yet to produce any water quality samples, as a rating curve is still being developed.

No long term trends analysis is available for this site as not enough data points are available.

3. Floatables Solids Monitoring

The County has developed protocols for its Floatables Monitoring Program. The program began during FY17, with a pilot study used to complete the first round of monitoring during Q1. Monitoring will be completed at 5 sites throughout the County on a quarterly basis according to the schedule posted below in Table 22.

Table 22 – Floatables Monitoring Schedule

Floatables Monitoring Schedule			
		Month	**Site**
Pilot Study	**Q1**	July	Andrew Leitch
		August	Dawkins Branch
			Flat Branch
		September	Liberia Ave.
			Cornice Place
Floatables Monitoring Main Program Year 1	**Q2**	October	Andrew Leitch
		November	Dawkins Branch
			Flat Branch
		December	Liberia Ave.
			Cornice Place
	Q3	January	Andrew Leitch
			Dawkins Branch
		February	Flat Branch
			Cornice Place
		March	Liberia Ave.
			Andrew Leitch
	Q4	April	Dawkins Branch
			Flat Branch
		May	Liberia Ave.
		June	Cornice Place
Floatables Monitoring Main Program Year 2	**Q1**	July	Andrew Leitch
		August	Dawkins Branch
			Flat Branch
		September	Liberia Ave.
			Cornice Place
	Q2	October	Andrew Leitch

		November	Dawkins Branch
			Flat Branch
		December	Liberia Ave.
			Cornice Place
	Q3	January	Andrew Leitch
		February	Dawkins Branch
			Flat Branch
			Cornice Place
		March	Liberia Ave.
			Andrew Leitch
	Q4	April	Dawkins Branch
			Flat Branch
		May	Liberia Ave.
		June	Cornice Place
.	.	.	.
.	.	.	.

Table 23 – Floatable Monitoring from July-January 2016

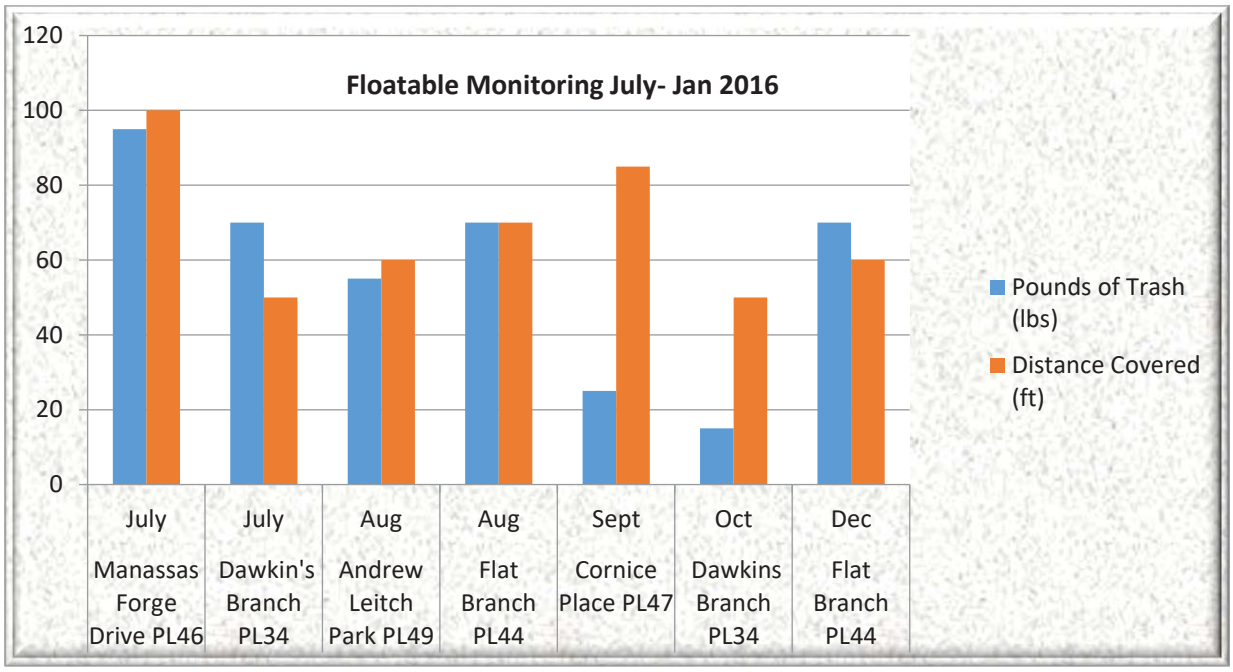
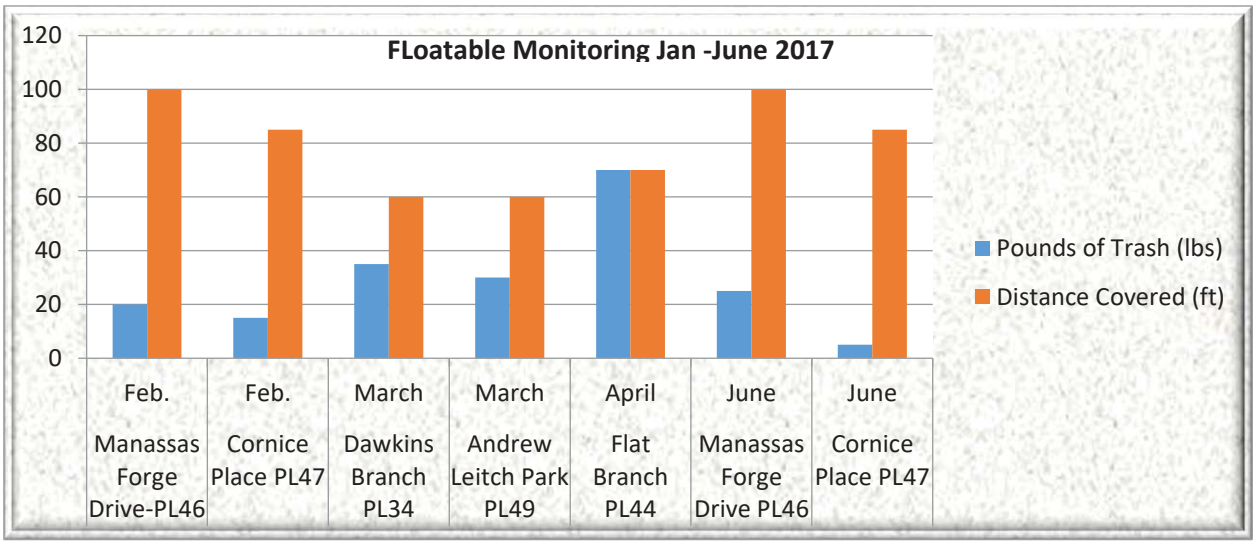


Table 24 – Floatable Monitoring from January-June 2017



July 2016 – January 2017

The first round of monitoring from four sites in 2016, registered a high amount of trash that was relative to the distance covered except with the Cornice Place, which show a lower load. Comparing the results from the first and second rounds of monitoring, Dawkins Branch showed a drop in trash load from 70 lbs. to 15lbs while the Flat Branch maintained a relative high load despite a slight reduced in the distance covered.

January – June 2017

The first round of monitoring in 2017 showed a drop in trash load except at the Flat Branch, which shows a significant high load.

Overall, monitoring during this period presented a significant drop in trash compared to 2016 although with some exceptions like the Flat Branch.

To conclude, this program is in its early stage but some spikes have been identified as leads to help take the program to its next phase. For example:

- The type and nature of trash collected at Dawkin's Branch has provided clues on the main source
- High trash load from the Flat Branch needs more ideas on ways to approach the nearby business on better trash management measures
- Andrew Leach site, which is second in trash load to Dawkins Branch, will need some measures like community outreach on trash awareness.
- Some communities have been engaged in keeping their streams clean such as the Manassas Forge site Community.

4. Structural and Source Controls Compliance Monitoring

An electronic database containing all BMP/SWM facilities within Prince William County will be provided with this document when submitted. The database contains information on a facilities

type, latitude and longitude, impervious and total acres treated, installation date, HUC 12, privately or permittee maintained status, discharging MS-4 and dates of inspection and maintenance for all new facilities since July 2016.

Prince William County maintains a program for the inspection and maintenance of permittee and privately maintained SWM/BMP facilities. More information on these inspection programs, and a list of newly constructed SWM facilities, can be found in section II.f of this document.

III. TMDL Action Plan Implementation

1. Chesapeake Bay Watershed TMDL Planning

Prince William County submitted the required Chesapeake Bay TMDL Action Plan (Action Plan) on December 16, 2016, which was subsequently approved on June 28, 2017. A copy of the approval letter is included in Appendix III. The Action Plan documents how the County intends to meet the requirements of the Chesapeake Bay Special Condition included in the MS4 Permit.

In Section I.D.1, Chesapeake Bay Special Condition, the County is required to document the means and methods that will be utilized to meet the required reductions of specific Pollutants of Concern (POCs) allocated in the Special Condition of the Commonwealth of Virginia's Phase I and II Chesapeake Bay Total Maximum Daily Load (TMDL) Watershed Implementation Plans (WIPs). These reductions are based on the Level 2 (L2) scoping run of the Chesapeake Bay Watershed Model for existing developed lands (pervious and impervious regulated urban lands developed prior to July 1, 2009). Level 2 implementation equates to an average reduction of 9% of nitrogen loads, 16% of phosphorous loads, and 20% of sediment loads from impervious regulated areas and 6% of nitrogen loads, 7.25% of phosphorous loads, and 8.75% of sediment loads from pervious regulated acres beyond the 2009 progress run loadings.

As part of this effort, Virginia Department of Environmental Quality (VADEQ) has committed to a phased approach for MS4 permittees to implement necessary reductions. Permittees will have up to three, five-year permit cycles to achieve required reductions. Prince William County's first permit cycle (December 17, 2014 – December 16, 2019) represents implementation of 5% of the L2 as specified in the 2010 Phase I WIP. The second permit cycle will require an additional 35% of total L2 reductions (40% cumulative), while the final permit cycle will require implementation of the remaining 60% of reductions (100% cumulative).

The total reductions planned to be achieved during the first permit cycle, as identified in the approved Action Plan, are listed in Table 25. The table also identifies the percent of the L2 scoping run reductions that will be achieved after implementation of the Action Plan.

Table 25. Planned Reductions per Approved Action Plan

Pollutant of Concern	Planned 1st Permit Cycle Load Reductions (lbs/yr)	Percentage of L2 Reduction Achieved After Implementation
Total Nitrogen (TN)	6,706.58	33.5%
Total Phosphorus (TP)	1,370.40	62.0%
Total Suspended Solids (TSS)	893,286.63	49.4%

Progress Toward Meeting Compliance Target

Prince William County has a comprehensive watershed improvement program, which aims to improve water quality through the implementation of water quality improvement projects such as stormwater facility retrofits, stream restorations, and reforestation projects. During the reporting period, six projects were implemented, which resulted in significant pollutant reductions. Refer to Table 26 for a summary of the pollutant reductions achieved with this projects.

Table 26. Pollutant Reductions Achieved During Reporting Period

Project Name	Project Type	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	TSS Reduction (lbs/yr)
East Longview - Route 1 Restoration	Stream Restoration	22.52	50.96	4,543.39
Dewey's Creek Reach 4	Stream Restoration	21.20	19.22	4,276.94
Reach 5	Stream Restoration	147.26	141.55	93,191.17
SWM Facility #28	SWM Retrofit	61.65	5.13	4,843.10
Bristoe Battlefield - BOCS Land	Reforestation	100.17	5.32	1,860.11
Hunter Ridge Estates Area B	Reforestation	34.01	1.81	631.56
Total Reductions		**386.81**	**223.98**	**109,346.27**

Project descriptions, as well as before and after photographs, of projects implemented during this reporting period are included below. In addition, the updated reduction summary tables and associated reduction calculation worksheets are included as Appendix III.

Based on the reductions achieved through implementation of the above listed water quality improvement projects and the previous reductions identified in the approved Action Plan, Table

27 summarizes the cumulative progress toward meeting the compliance targets. The permit requires that 5% of the L2 reductions be achieved during the first permit cycle. As shown in the table below, this requirement has been exceeded and the additional reductions will be applied toward the second permit cycle required reductions.

Table 27. Cumulative Progress Toward Meeting Compliance Targets

Pollutant of Concern	Previous Reductions per Action Plan (lbs/yr)	FY17 Reductions (lbs/yr)	Total Reductions to Date (lbs/yr)	Percent of L2 Reduction Achieved to Date
Total Nitrogen (TN)	5,458.37	386.81	5,845.18	29.2%
Total Phosphorus (TP)	808.53	223.98	1,032.51	46.7%
Total Suspended Solids (TSS)	612,769.35	109,346.27	722,115.62	40.0%

During the next reporting period, six projects are planned for implementation. Please refer to Table 28 for a list of planned projects and their associated pollutant reductions.

Table 28. Planned Projects for FY18 Implementation

Project Name	Project Type	TN Reduction (lbs/yr)	TP Reductions (lbs/yr)	TSS Reduction (lbs/yr)
SWM Facility #147	SWM Retrofit	64.01	6.14	5,419.30
Dewey's Creek Reach 1	Stream Restoration	124.32	124.23	25,079.34
SWM Facility #489	SWM Retrofit	151.57	7.72	4,838.12
SWM Facility #109	SWM Retrofit	92.29	3.17	1,804.41
SWM Facility #424	SWM Retrofit	217.71	31.22	25,290.37
Bristoe Station Battlefield Phase 2	Reforestation	32.22	1.71	598.32
	Total	**682.11**	**174.19**	**63,029.87**

Project Descriptions

East Longview

The project was completed on February 14, 2017. The purpose of this project was to stabilize the stream channel and improve water quality and habitat along a degraded reach of an unnamed tributary to Marumsco Creek between Jefferson Davis Highway and East Longview Drive. Approximately, 11,381 square feet of stream channel, stream banks, and floodplain were disturbed during construction. The total disturbed area is 2.9 acres. The restoration of the reach, known as East Longview, involves the stabilization of 925 linear feet of channel, improving sediment transport, and protecting sanitary sewer infrastructure. This work required significant in-channel construction.

The project reach begins at the outlet of a 54-inch culvert east of Jefferson Davis Highway and flows for approximately 60 feet over concrete-grouted riprap before it drops approximately 3 feet at a head cut to native gravel-cobble bed material. The stabilization work included installation of jersey barriers and riprap, as well as grading and planting the bank slopes. The right bank, however, was approximately 5-7 feet high, nearly vertical, and was actively eroding.

After 300 feet, the channel makes several tight meander bends that have considerably widened the channel. Within this reach is an outlet from a stormwater control facility on the right bank. The stormwater BMP collects runoff from the neighboring Hendricks Automotive Group site to the south. Eighty feet past the stormwater outlet, a ten-inch sanitary sewer line crosses the channel seven feet above the streambed. The earth surrounding and foundation for the sewer line creates a pinch point in the channel.

Below the sewer line crossing, the left bank slope has been stabilized with filter fabric and large riprap. The riprap has slid downslope to some degree. Immediately downstream from the rip rap slope, the stream channel enters a deep reach, which was widened. This reach extends for more than two hundred feet before the channel discharge empties into a 54-inch concrete culvert below East Longview Road.

Dewey's Creek Reach 4

Dewey's Creek Reach 4 was completed on January 11, 2017 and restored approximately 400 linear feet of Dewey's Creek, a tributary to Quantico Creek. The project is located immediately upstream from the Possum Point Road crossing (Route 633), in Prince William County, Virginia. Reach 4 was highly unstable due to erosive urban flows, tortuous meanders, lack of stabilizing mature root systems, and highly erodible soils. At the terminus of the project, area is a quintuple box culvert at Possum Point Road. This road crossing flooded during high storm events due to debris jams and the angle at which the channel entered the box culvert.

The goal of the project was to create a channel with a stable pattern, profile, and dimension, stabilize actively eroding banks, and protect existing adjacent and crossing sewer and utility lines. Natural channel design was utilized, along with data collected from an identified reference reach, to develop the limits for the design. Streambank stabilization structures were employed in the stream restoration. Invasive plants will be removed and replaced with native trees, shrubs, and herbaceous vegetation.

Reach 5 Stream Restoration

Reach 5 was completed on May 12, 2017. The project is an urban stream restoration project of an unnamed tributary to the Occoquan River Watershed. The project drains approximately 90 acres to the Occoquan Reservoir/Occoquan River, the Potomac River and eventually the Chesapeake Bay. This project was identified as a priority project in the Occoquan River Watershed Study completed on March 5, 2014.

The project is located in Woodbridge, Virginia and the site lies east of Antietam Road, north of Old Bridge Road, west of Oakwood Drive, and south of Woodfern Court. The project involved the stabilization and riparian corridor revegetation of 2,100 linear feet of stream, including 1,520 feet of main channel and 580 feet of tributary channels (Tributary 1 and 2). The restoration reach begins east of Antietam Road where two separate culverts (36" CMP) outfall from under the road. The two branches of the stream meet approximately 200 feet downstream and continue flowing eastward for approximately 1,100 feet. The restoration work ends where the primary channel enters an existing stormwater management facility.

The moderately sloping site is largely forested. Channel conditions varied widely throughout the project area, due in large part to periodic grade control afforded by existing bedrock outcroppings. The upstream portion of the channel was mostly stable, with scour at the culvert outfalls near Antietam Road and mild to moderate bank erosion downstream. Beginning at approximately station 15+50 (Profile Sheet #10), channel conditions deteriorated and bedrock control was less pronounced. This section had high, vertical, eroding banks and showed signs of significant instability. Two stormwater outfalls flowing into the main channel from the north have resulted in significant erosion of side channels (Tributary 1 and 2). Near the downstream end, bedrock features reemerge to improve channel stability just prior to the channel entering an existing stormwater management facility.

Project objectives include:

- Implement natural channel design techniques to stabilize the stream
- Reconnect stream segments with floodplain features
- Reforest floodplain with native plantings for stabilization
- Protect county infrastructure such as sanitary sewer mains
- Improve water quality by removing pollutants
- Improve habitat for aquatic insects and fish

This project did not impact any wetlands. On the contrary, it incorporated the creation of new wetlands to promote aquatic life. Since a stormwater management facility is located at the lower end of the stream restoration project, the streams below this facility were minimally impacted. Following completion of the project, the stormwater management facility will be retrofitted.




SWM Facility 28 Water Quality Retrofit

The project was completed on September 6, 2016. Stormwater Management Facility 28 is a privately maintained facility within Subshed 448 of the Occoquan Watershed in Woodbridge, Virginia. The facility is located 700 feet east of Clipper Drive surrounded by Mariner and Macrina Drives to the north and Mayflower Drive to the southwest in the Lake Ridge Section 8C subdivision. This retrofit design was developed from the conceptual design initially presented in the Occoquan Watershed - Study of Four Subwatersheds dated March 5, 2015 as prepared for the County by Wetland Studies and Solutions, Inc. (WSSI). As stated in the study, the goals of this retrofit are to:

(1) Improve water quality treatment by storing the Water Quality Treatment Volume (Tv) and detaining it for a minimum of 24 hours.
(2) Protect the downstream channel
(3) Maintain the 10- and 100-year outflows at existing levels
(4) Provide a minimum of 1-foot freeboard for the dam during the 100-year storm event.

This (approximately 0.9 acre) facility is situated on the edge of a moderately steep terrain that is well forested. The watershed is approximately 90 acres and predominately piped with two streams

feeding directly into the facility. The stream from Clipper Drive shows signs of erosion, but is largely protected by riprap. The downstream receiving channel is stable.

Bristoe Battlefield – BOCS Land

This project was completed on May 25, 2017 and involved the reforestation of 13.99 acres within the Bristoe Station Battlefield Heritage Park. The project involved the planting of container tree seedlings (aka "tubelings") that are a minimum of 12"-18" in height. A combination of overstory species and understory species will be planted. All species will be indigenous to the area. Protective tube shelters will not be used due to the need to keep the aesthetic of the site as natural as possible. Instead, a higher than normal density of plantings (650 seedlings/ac compared to our normal 450 seedlings/ac) will be installed. The higher density will help compensate for losses from deer browse anticipated due to the lack of protective tubes. Weed mats, either natural coconut fiber or VisPore Weed Mats, will be used because the cost of mulching the trees under our contract would more than double the per acre cost of planting. The perpetuation of the reforestation is guaranteed by a Deed of Easement with the Virginia Department of Historic Resources.

Hunter Ridge Estates Area B

The project was completed on October 31, 2016 and entailed the reforestation of 4.75 acres with trees indigenous to Prince William County in the permanent open space of Hunter Ridge Estates. This open space is protected by proffer conditions and deed restrictions limiting disturbance to the open space. Prior to development, the project site was a horse farm. This reforestation project is in addition to two prior reforestation projects in the Powells Creek watershed, all within a 2-mile stretch of the creek. Hunter Ridge is an upland site and effectively returns forest cover to the headwaters of two side tributaries to Powells Creek. The reforestation creates an initial forest composed of deciduous overstory and understory species. Planting density was sufficient to close the forest canopy within 6 to 10 years under normal rainfall conditions. The resulting leaf drop will convert the existing grass dominated ground cover to a healthy leaf layered forest floor, which is significantly better at infiltrating storm water, preventing erosion, and will result in improved water quality.

2. TMDL Action Plans other than the Chesapeake Bay TMDL

The County submitted Action Plans for bacteria, benthic, and PCB TMDL's in December of 2016. A confirmation of DEQ receiving these plans is in Appendix III.

IV. Additional Reporting Requirements

1. Roles and responsibilities

Roles and responsibilities are provided as part of the County's MS4 program plan. Roles and responsibilities can be reviewed as part of each BMP section within the MS4 Program plan.

2. Non Compliance

There were no instances of non-compliance to record during the Reporting period.

3. Budget

Environmental Services Division - Watershed Management Branch

FY17 Annual Budget Summary by Activity

Development Review & Inspections	$	3,360,812
Watershed Management & Inspections	$	5,102,907
Environmental Education	$	160,333
Soil & Water Conservation District	$	237,264
Drainage	$	3,635,748
TOTAL FY17 Expenditure Budget	**$**	**12,497,064**

A more detailed budget can be viewed in Appendix III of this document.

4. Permit Fees

Permit fees for FY18 were submitted to the Department on September 8th 2017 with Check #551612.

Appendix A – Construction Site Runoff and Post Construction Runoff

FY17 Summary Count of Site Inspections and Enforcement Actions

Month	Erosion Inspections	Site Inspections	Inspection Notice	Violation	Notice to Comply	Stop Work
Jul-16	784	390	18	1	0	0
Aug-16	907	447	34	1	0	0
Sep-16	331	186	5	0	0	0
Oct-16	993	639	0	0	0	0
Nov-16	836	523	0	0	0	0
Dec-16	934	573	1	0	0	0
Jan-17	1101	685	8	0	0	0
Feb-17	1043	562	6	6	0	0
Mar-17	1122	615	17	2	0	0
Apr-17	1056	690	13	2	1	0
May-17	1121	614	4	8	1	0
Jun-17	807	551	11	2	0	0
Total	**11035**	**6475**	**117**	**22**	**2**	**0**

FY17 Land Disturbing Activities Approved with Acres Disturbed

Project Name	LND Number	Date Issued	Plan Number	Disturbed Area (acres)
AVENDALE (WOODLAND GROVE) SEC 5 E&S PLAN	LND2017-00001	07-06-2016	SDR2016-00082	0.50
HORNBAKER IND PK LOT 12	LND2017-00002	07-07-2016	08-00186R01S01	1.53
INNOVATION 2 SILOS BREWING CO	LND2017-00003	07-07-2016	SPR2016-00192	7.72
POTOMAC SHORES FISHING PIER	LND2017-00004	07-07-2016	SPR2016-00127	0.08
SAM'S CLUB - EXTERIOR CHANGES & ADDITION	LND2017-00005	07-07-2016	SPR2016-00355	0.04
CHURCH OF GOD CAMP MEETING ASSOC	LND2017-00006	07-08-2016	SPR2016-00351	0.00
RIVER OAKS VETERINARY CLINIC	LND2017-00009	07-12-2016	SPR2016-00327	0.01
VERIZON WIRELESS - LONGVIEW / PWC FAIR GROUNDS	LND2017-00010	07-13-2016	SPR2016-00102	0.00
BUSSARD KENNEL	LND2017-00011	07-18-2016	12-00081R00S04	0.40
RIVERGATE	LND2017-00012	07-18-2016	SPR2015-20179	14.68
WALGREENS @ HOADLY RD - CAR CHARGING STATION	LND2017-00014	07-21-2016	SPR2016-00374	0.00
DOMINION VALLEY COUNTRY CLUB SEC 53	LND2017-00016	07-22-2016	SDR2015-20107	37.89
DOMINION VALLEY COUNTRY CLUB SEC 53	LND2017-00015	07-22-2016	08-00056R00S03	0.00
COPT DC-19 AT BETHLEHEM TECHNOLOGY PARK	LND2017-00020	07-26-2016	SPR2016-00320	19.24
PWC OPERATIONS & MAINTENANCE FLEET FACILITY	LND2017-00021	07-26-2016	SPR2016-00117	0.00
VIRGINIA GATEWAY PH 5 - REV TO BLDG N	LND2017-00019	07-26-2016	SPR2016-00302	44.67
19201 CARDINAL HEIGHTS RD LAND DISTURBANCE	LND2017-00022	07-28-2016	PWR2017-00001	0.11
VIRGINIA GATEWAY PH 5 - REV TO BLDG N	LND2017-00023	07-29-2016	SPR2016-00302	0.00
CHILDREN OF AMERICA @ MARUMSCO PLAZA	LND2017-00025	08-02-2016	SPR2016-00268	0.00
THOMASSON BARN - INFRASTRUCTURE	LND2017-00026	08-03-2016	SPR2016-00262	1.50
CHAPMAN-BEVERLEY MILL	LND2017-00028	08-04-2016	13-00014R00S01	1.39
HOMESTEAD BUILDING SYSTEM	LND2017-00027	08-04-2016	SPR2017-00008	0.05
UNIVERSITY VILLAGE APARTMENTS	LND2017-00029	08-05-2016	13-00136R00S03	35.39
OSBOURN PARK HIGH SCHOOL - SWM	LND2017-00017	08-08-2016	SP0695XXR06S02	1.51
LAKE MANASSAS PROFESSIONAL VILLAGE	LND2017-00030	08-10-2016	14-00184R00S02	4.94
OLD CENTREVILLE GARDEN CONDO	LND2017-00031	08-10-2016	14-00260R00S02	0.16
SUPERIOR PAVING CORP	LND2017-00032	08-10-2016	SPR2016-00362	20.09
AMERICAN LEGION POST 364	LND2017-00033	08-11-2016	SPR2015-20027	2.55
WELLINGTON GLEN LB C PH 4	LND2017-00034	08-11-2016	SPR2015-20060	19.10
AMERICAN WARTIME MUSEUM - E&S PLAN	LND2017-00036	08-17-2016	SPR2015-20233	10.14
BROAD RUN INDUSTRIAL PARK LOT 6A4	LND2017-00037	08-17-2016	SPR2015-20052	5.57
GOMEZ FUENTES COLLISION	LND2017-00039	08-17-2016	15-00030R00S01	1.20
HAYMARKET CROSSING	LND2017-00038	08-17-2016	SPR2016-00176	17.05

Project Name	LND Number	Date Issued	Plan Number	Disturbed Area (acres)
SUMMERLAND SEC 2 - FIRELINE PROFILES	LND2017-00040	08-17-2016	SPR2017-00052	0.00
HOLY FAMILY CHURCH	LND2017-00041	08-18-2016	SPR2017-00049	0.03
PARK VALLEY CHURCH EXPANSION	LND2017-00043	08-19-2016	SPR2016-00083	9.32
PNC BANK @ LAKE MONTCLAIR	LND2017-00044	08-23-2016	SPR2017-00039	0.01
BRISTOW INDUSTRIAL PARK PARC B-1A1	LND2017-00046	08-26-2016	15-00047R00S01	4.57
GARBER SHOPPING CENTER - JUSTAS CHICKEN #2	LND2017-00047	08-26-2016	SPR2017-00056	0.00
MOUNTAIN VIEW ELEMENTARY SCHOOL	LND2017-00045	08-26-2016	SPR2017-00016	0.58
CHIPOTLE @ OPITZ CROSSING	LND2017-00049	08-31-2016	SPR2016-00213	0.74
DOMINION VALLEY CC SEC 10	LND2017-00048	08-31-2016	SPR2017-00071	0.00
RENAISSANCE MONTESSORI SCHOOL	LND2017-00052	09-02-2016	SPR2016-00350	0.00
VERIZON WIRELESS @ CROSSING WEST	LND2017-00050	09-02-2016	SPR2016-00275	0.00
KESSINGER HUNTER BLDG #4 - EARLY GRADING	LND2017-00054	09-07-2016	SPR2017-00033	0.00
4323 BANBURY DRIVE (ZON2016-03682)	LND2017-00057	09-09-2016	PWR2017-00005	0.07
DEWEYS CREEK STREAM RESTORATION	LND2017-00056	09-09-2016	SPR2016-00265	1.49
TACKETTS MILL SHOPPING CENTER - LAYLA RESTAURANT	LND2017-00061	09-13-2016		0.00
POTOMAC SHORES PH2A SEC 1B&1C TEMPORARY PARKING FOR SALI	LND2017-00062	09-16-2016	SPR2017-00068	0.00
RIVER OAKS COMMERCIAL PAR B5A	LND2017-00063	09-20-2016		1.62
ACT WELLNESS CENTER	LND2017-00064	09-21-2016		0.88
NEABSCO BAPTIST CHURCH-STORM SEWER, WATER LINE, CEMETERY	LND2017-00065	09-23-2016	SPR2016-00360	8.42
LAKE MANASSAS ASSISTED LIVING FACILITY	LND2017-00067	09-26-2016	14-00087R00S03	5.44
POTOMAC SHORES LB 3	LND2017-00069	09-27-2016	SDR2015-20093	65.25
HOPPMAN PROPERTY LOT 1 PH 2	LND2017-00070	09-28-2016	SPR2017-00055	7.16
MOLINARI JUVENILE SHELTER	LND2017-00072	09-29-2016	SPR2016-00295	0.04
1230 EASY ST RPA RESTORATION PLAN-GRADING	LND2017-00073	09-30-2016	SPR2016-00285	0.60
BALLS FORD ROAD FLEX	LND2017-00074	09-30-2016	06-00028	8.40
HAMPTON SQUARE	LND2017-00075	09-30-2016	SPR2017-00076	7.50
INDEPENDENT HILL ALTERNATE EDUCATION SCHOOL	LND2017-00076	10-03-2016	SPR2016-00245	13.10
MANASSAS CORPORATE CENTER - DATA CENTER BLDG 1	LND2017-00077	10-03-2016	SPR2016-00304	20.90
LIDL AT ASHTON AVENUE	LND2017-00080	10-04-2016	SPR2016-00209	4.40
TACKETT'S VILLAGE GROCERY	LND2017-00079	10-04-2016	SPR2016-00299	4.31
VIRGINIA SOUTHSIDE EXPANSION PROJECT II - STA 185	LND2017-00081	10-05-2016		7.84
MAY'S QUARTER PH 4	LND2017-00084	10-11-2016	SDR2017-00010	31.97
BRADYS VILLAGE	LND2017-00086	10-12-2016	SDR2016-00070	2.01

Project Name	LND Number	Date Issued	Plan Number	Disturbed Area (acres)
PRESTIGE PRESCHOOL @ REID'S PROSPECT	LND2017-00085	10-12-2016	SPR206-00282	1.71
CANDLEWOOD SUITES @ OLD STAGE RD	LND2017-00087	10-14-2016	14-00059R00S04	0.00
POWELLS CREEK PEDESTRIAN BRIDGE	LND2017-00068	10-14-2016	SPR2015-20300	0.35
COMCAST @ GAINESVILLE	LND2017-00088	10-19-2016	SPR2017-00057	0.05
HL MOONEY - GUARD HOUSE	LND2017-00091	10-24-2016	SPR2016-00301	0.01
SHOPS AT STONEWALL - BUILDING I	LND2017-00090	10-24-2016	SPR2017-00007	0.35
DIZZY PIG BARBEQUE - PROPANE TANK	LND2017-00092	10-25-2016	SPR2017-00138	0.00
YOUTH FOR TOMORROW - VARIOUS BUILDINGS	LND2017-00094	10-27-2016	SPR2017-00017	8.14
YOUTH FOR TOMORROW - VARIOUS BUILDINGS	LND2017-00093	10-27-2016	15-00044	0.00
VERIZON WIRELESS @ BEAU RIDGE	LND2017-00095	10-28-2016		0.05
FEATHERSTONE IND CENTER PARC 11C	LND2017-00097	11-02-2016	SPR2017-00158	0.00
LEONARD BUILDING & TRUCK	LND2017-00096	11-02-2016	SPR2017-00041	0.00
DALE CITY ELEMENTARY SCHOOL	LND2017-00098	11-03-2016	SPR2016-00206	0.36
MAY'S QUARTER PH 1 PARKING LOT 38	LND2017-00101	11-08-2016	SPR2017-00172	0.00
BRADLEY FOREST SEC 3	LND2017-00102	11-09-2016	05-00583	7.17
KESSINGER HUNTER - BUILDING 4	LND2017-00103	11-09-2016	SPR2017-00032	43.67
GRAHAM PARK SHORES - SECTION ONE - LOT 21	LND2017-00104	11-10-2016	PWR2017-00010	0.22
MINNIEVILLE ROAD - PUBLIC IMPROVEMENT	LND2017-00105	11-10-2016	SPR2015-20094	20.00
POTOMAC SHORES - ATHLETIC FIELDS	LND2017-00131	11-10-2016	SPR2016-00090	28.30
CENTURYLINK HAYMARKET	LND2017-00123	11-12-2016	SPR2016-00344	0.12
HOLD-OCCOQUAN CIGAR SHOP	LND2017-00108	11-14-2016	14-00234	0.09
MERRITT I-66 BUSINESS PARK	LND2017-00106	11-14-2016	SPR2016-00028	42.60
MINNIEVILLE ELEMENTARY SCHOOL- ACTIVITY ROOM ADDITION	LND2017-00107	11-14-2016	SPR2016-00207	0.90
CAYDEN RIDGE LANDBAY A SEC 1	LND2017-00111	11-23-2016	SDR2016-00040	31.20
POTOMAC SHORES PH 2A - SEC 1B & 1C	LND2017-00114	11-30-2016	SDR2016-00076	44.49
EAVESDROP BREWERY	LND2017-00117	12-02-2016	SPR2016-00328	0.00
EXXON @ BALLS FORD ROAD	LND2017-00115	12-02-2016	SPR2017-00045	0.03
EXXON SUDLEY RD & LOMOND DR	LND2017-00116	12-02-2016	SPR2017-00046	0.03
MONTESSORI CHILDREN'S SCHOOL	LND2017-00118	12-02-2016	SPR2017-00099	0.01
HOME 2 SUITES HOTEL	LND2017-00119	12-06-2016	SPR2017-00160	0.00
LONGPOINTE SANITARY-PI PLAN	LND2017-00121	12-07-2016	SPR2016-00025	9.50
SIMMS PROPERTY LANDBAY 2 - MULTI-TENANT	LND2017-00120	12-07-2016	SPR2017-00018	0.19
MONTESSORI CHILDREN'S SCHOOL	LND2017-00122	12-08-2016	SPR2016-00322	0.00

Project Name	LND Number	Date Issued	Plan Number	Disturbed Area (acres)
OWL FIRE DEPARTMENT #12 APRON REPLACEMENT	LND2017-00124	12-20-2016	SPR2017-00117	0.00
PWC LANDFILL EROSION & SEDIMENT CONTROL	LND2017-00125	12-20-2016	SPR2017-00030	120.00
COPPER MILL ESTATES	LND2017-00126	12-22-2016	SDR2016-00062	26.88
OLD DOMINION HUNT TOWNHOMES	LND2017-00127	12-28-2016	05-00203	6.80
BRADLEY SQUARE SECTION 5-SITE DEV	LND2017-00128	12-29-2016	15-00073	14.08
DC-19 @ BETHLEHEM TECH PARK	LND2017-00129	01-03-2017	SPR2017-00075	47.12
POTOMAC SHORES LANDBAY 4 SEC 1	LND2017-00132	01-04-2017	15-00064	76.80
POTOMAC SHORES-ATHLETIC FIELDS	LND2017-00131	01-04-2017	SPR2016-00090	28.30
POTOMAC SHORES LB 4 S1	LND2017-00132	01-05-2017	15-00064	76.80
GEORGE HELLWIG PARK - CLUBHOUSE BUILDING	LND2017-00130	01-10-2017	SPR2016-00311	0.21
AIRPORT GATEWAY COMMERCE CENTER	LND2016-00155	01-12-2017	SPR2016-00143	17.37
REACH 5 STREAM RESTORATION	LND2017-00133	01-17-2017	SPR2017-00154	5.60
SHEETZ AT BRISTOW	LND2017-00135	01-18-2017	SPR2016-00151	4.48
HEATHCOTE COMMONS LB 3 PH 3	LND2017-00137	01-20-2017	SDR2015-20002	7.56
HEATHCOTE COMMONS LB 3 PH 3	LND2017-00138	01-20-2017	SDR2017-00008	0.00
HEATHCOTE COMMONS LB 4 BUILDINGS I	LND2017-00136	01-20-2017	12-00153	7.70
WAWA AT LIBERIA	LND2017-00140	01-25-2017	SPR2016-00160	2.16
EVERGREEN FIRE DEPARTMENT	LND2017-00143	02-01-2017	SPR2017-00265	0.01
CARDINAL GROVE AT EAGLES POINTE SEC 1	LND2016-00162	02-02-2017	SDR2016-00003	45.98
BROAD RUN INDUSTRIAL PARK LOT 1LA	LND2017-00148	02-03-2017	SPR2017-00073	0.29
EZ STORAGE AT POTOMAC MILLS - OFFICE TRAILER	LND2017-00146	02-03-2017	SPR2017-00255	3.93
EZ STORAGE AT POTOMAC MILLS-TEMP MODULAR	LND 2017-00145	02-03-2017	SPR2017-00257	0.00
FINLEY ASPHALT AND SEALING - HORNBAKER ROAD	LND2016-00163	02-03-2017	SPR2015-20099	8.30
SUPERIOR PAVING CORP	LND2016-00165	02-05-2017	15-00087R00S01	0.00
METRODATA OFFICE BUILDING	LND2017-00150	02-07-2017	SPR2017-00281	0.00
MISSION BBQ AT SMOKETOWN STATION	LND2017-00163	02-08-2017	SPR2016-00357	0.35
VERIZON @ SUDLEY MANOR	LND2017-00151	02-08-2017	SPR2017-00221	0.00
VERIZON WIRELESS @ GAINESVILLE SOUTH	LND2017-00152	02-08-2017	SPR2017-00220	0.01
EAGLES POINTE LANDBAY C SECS 1 AND 4	LND2017-00153	02-09-2017	SDR2017-00024S03	0.65
84 LUMBER- BUILDING #6	LND2017-00155	02-14-2017	04-00034	1.55
CREATIVE PRESCHOOL	LND2017-00157	02-14-2017	SPR2017-00229	0.01
VETERANS MEMORIAL PARK	LND2017-00156	02-14-2017	SPR2017-00264	0.60
NEABSCO MARINA - DOCK BULKHEAD	LND2017-00158	02-17-2017	SPR2017-00195	0.01

Project Name	LND Number	Date Issued	Plan Number	Disturbed Area (acres)
MY PLUMBER PARKING LOT EXPANSION	LND2017-00159	02-22-2017	SPR2017-00128	1.28
PNC HOLDINGS - CITY GRILL (FORMERLY PARGOS)	LND2017-00161	02-23-2017	SPR2017-00285	0.00
FAIRFAX ROD AND GUN CLUB	LND2016-00201	03-03-2017	SPR2016-00145	12.92
DISCOVERY CENTER I & II @ INNOVATION (STOCKPILE)	LND2017-00168	03-07-2017	SPR2017-00320	0.69
GARBER SHOPPING CENTER	LND2017-00167	03-07-2017	SPR2017-00103	0.93
REGENCY AT CREEKSIDE SEC 2	LND2017-00169	03-08-2017	SDR2016-00072	35.80
ALGER PROPERTY - SHED	LND2016-00187	03-09-2017	SPR2016-00239	0.00
MONTCLAIR ELEMENTARY SCHOOL	LND2017-00172	03-10-2017	SPR2016-00193	0.03
GLENKIRK ESTATES - POOL DECK EXTENSION	LND2017-00173	03-15-2017	SPR2017-00321	0.04
WOODBRIDGE CLUB HOUSE	LND2017-00176	03-17-2017	SPR2017-00171	0.04
DRIVETIME AT WOODBRIDGE	LND2017-00177	03-23-2017	SPR2016-00358	2.69
LONGPOINTE SANITARY - PI PLAN	LND2017-00178	03-27-2017	SPR2017-00244	9.80
HAMPTON SQUARE - SALES TRAILER	LND2017-00179	03-28-2017	SPR2017-00247	7.50
BROAD RUN INDUSTRAIL PARK LOT 2A2A (B & S SITE)	LND2017-00188	03-30-2017	SPR2015-20239	0.00
PANTHER PRIDE SELF STORAGE	LND2017-00180	03-30-2017	SPR2017-00067	4.12
PATTIE ELEMENTARY SCHOOL ADDITION	LND2017-00186	03-31-2017	SPR2017-00187	3.25
PREMIER BUSINESS PARK	LND2017-00182	03-31-2017	12-00089	35.50
BANK OF AMERICA	LND2017-00184	04-06-2017	SPR2017-00115	0.00
MILESTONE CHINN PARK REGIONAL LIBRARY	LND2017-00185	04-07-2017	SPR2017-00134	0.08
LEONARDS BUILDING AND TRUCK ACCESSORIES	LND2017-00189	04-12-2017	SPR2017-00272	0.01
GARFIELD HIGH SCHOOL - ADA ACCESSIBLE WALK	LND2017-00190	04-17-2017	SPR2017-00236	0.30
PWC LANDFILL	LND2017-00191	04-21-2017	SPR2017-00213	0.00
GLEN ARBOR APTS CLUBHOUSE	LND2017-00202	04-27-2017	SPR2017-00155	0.41
OCCOQUAN RIDGE CONDOMINIUM-DUMPSTER RELOCATION	LND2017-00203	04-28-2017	SPR2017-00362	0.01
DEWEY'S CREEK PH 1	LND2017-00193	05-03-2017	SPR2017-00100	3.83
CRACKER BARREL AT DUMFRIES	LND2017-00206	05-04-2017	SPR2017-00288	0.01
COLVIN FARM - E &S PLAN	LND2017-00208	05-09-2017	SDR2017-00002	26.78
HYLTON SHOP - ADDING TEMPORARY GAS TANK	LND2017-00207	05-09-2017	SPR2017-00384	0.00
POTOMAC SHORES - TOWN CENTER LAND BAY 9 BLOCK 1	LND2017-00181	05-09-2017	SDR2016-00060	29.10
BROAD RUN INDUSTRIAL PARK LOT 6A5	LND2017-00209	05-10-2017	SPR2017-00329	1.41
BRADLEY SQUARE - DEBRIS REMOVAL & RESTORATION PLAN	LND2017-00211	05-12-2017	SDR2017-00036	3.50
VERIZON @ DALE CITY	LND2017-00212	05-15-2017	SPR2017-00239	0.03
AVENDALE WOODLAND GROVE S5	LND2017-00222	05-16-2017	12-00088	4.70

Project Name	LND Number	Date Issued	Plan Number	Disturbed Area (acres)
LAWRENCE PROPERTY INVESTMENTS LLC	LND2017-00215	05-22-2017	SPR2017-00025	2.30
AVENDALE (WOODLAND GROVE) SEC 4	LND2017-00219	05-23-2017	12-00041	12.71
GAINSFORD INDUSTRIAL PARK	LND2017-00218	05-23-2017	SPR2017-00085	0.02
ENVIROSOLUTION (BROAD RUN IND PK LOT 7A)	LND2016-00243	05-25-2017	SPR2016-00270	0.10
YOUTH FOR TOMORROW - TRAILERS	LND2017-00220	05-26-2017	SPR2016-00378	0.43
DOMINION VALLEY COUNTRY CLUB SEC 54 LB 7A	LND2017-00224	06-06-2017	08-00076R00S03	20.97
EVERBROOK ACADEMY - GARDNER STATION	LND2017-00229	06-06-2017	SPR2017-00214	4.62
FREEDOM HIGH SCHOOL - TURFIELD CONVERSION	LND2017-00225	06-07-2017	SPR2017-00346	5.69
CARLYLE STATION - THE POINT AT BULL RUN	LND2017-00231	06-09-2017	SPR2017-00433	0.00
RIVER OAKS ELEMENTARY SCHOOL	LND2017-00230	06-09-2017	SPR2017-00334	0.00
BRISTOW INDUSTRIAL PARK HLS BLDG	LND2017-00232	06-12-2017	SPR2017-00206	3.26
7 ELEVEN AT YORKSHIRE	LND2017-00233	06-14-2017	SPR2016-00167	1.06
RUSTON PAVING	LND2017-00234	06-15-2017	SPR2016-00297	3.22
AT&T @ FEATHERSTONE / OWL VOL. FIRE DEPT.	LND2017-00235	06-16-2017	SPR2017-00352	0.01
WINGATE INN	LND2017-00237	06-19-2017	08-00225	1.86
POTOMAC SHORES LANDBAY 4 SEC 1	LND2017-00239	06-21-2017	SDR2017-00037	0.00
S.W. RODGERS ADDITION	LND2017-00240	06-21-2017	SPR2017-00276	3.00
EVERBROOK ACADEMY @ NEW BRISTOW VILLAGE	LND2017-00242	06-26-2017	SPR2017-00156	2.52
LINDEN LAKES OFFICE PLAZA	LND2017-00241	06-26-2017	SPR2017-00177	0.01
FOUR SEASONS MAINTENANCE BLDG	LND2017-00245	06-27-2017	SPR2017-00301	0.00
INNOVATION @ PRINCE WILLIAM	LND2017-00247	06-27-2017	SPR2017-00299	3.37
LIFE TIME FITNESS AT VIRGINIA - EARLY GRADING	LND2017-00246	06-27-2017	SPR2017-00404	21.60
PATRIOT BUSINESS CENTER BUILDING F	LND2017-00244	06-27-2017	SPR2017-00323	5.58
CANDLEWOOD SUITES @ OLD STAGE RD	LND2017-00249	06-29-2017	SPR2017-00317	3.65
CAYDEN RIDGE - PI PLAN	LND2017-00251	06-30-2017	SPR2016-00134	0.64
PRINCE WILLIAM COUNTY ANIMAL SHELTER	LND2017-00250	06-30-2017	SPR2017-00355	0.01
	191			**1,478.64**

Appendix B – Retrofitting on Prior Developed Lands

SWM Facility 28 Water Quality Retrofit

Stormwater Management Facility 28 is a privately maintained facility within Subshed 448 of the Occoquan Watershed in Woodbridge, Virginia. The facility is located 700 feet east of Clipper Drive surrounded by Mariner and Macrina Drives to the north and Mayflower Drive to the southwest in the Lake Ridge Section 8C subdivision (see attached Vicinity Map).

This retrofit design was developed from the conceptual design initially presented in the Occoquan Watershed - Study of Four Subwatersheds dated March 5, 2015 as prepared for the County by Wetland Studies and Solutions, Inc. (WSSI). As stated in the study, the goals of this retrofit is to (1) improve water quality treatment by storing the Water Quality Treatment Volume (Tv) and detaining it for a minimum of 24 hours, (2) protect the downstream channel, (3) maintain the 10- and 100-year outflows at existing levels, and (4) provide a minimum of 1-foot freeboard for the dam during the 100-year storm event.

This approximately 0.9 acre facility is situated on the edge of a moderately steep terrain that is well-forested. The watershed is approximately 90 acres and predominately piped with two streams feeding directly into the facility. The stream from Clipper Drive shows signs of erosion, but is largely protected by riprap. The downstream receiving channel is stable. A drainage area map that highlights the suburban land uses and the piped network is provided (see attached Drainage Area Map).

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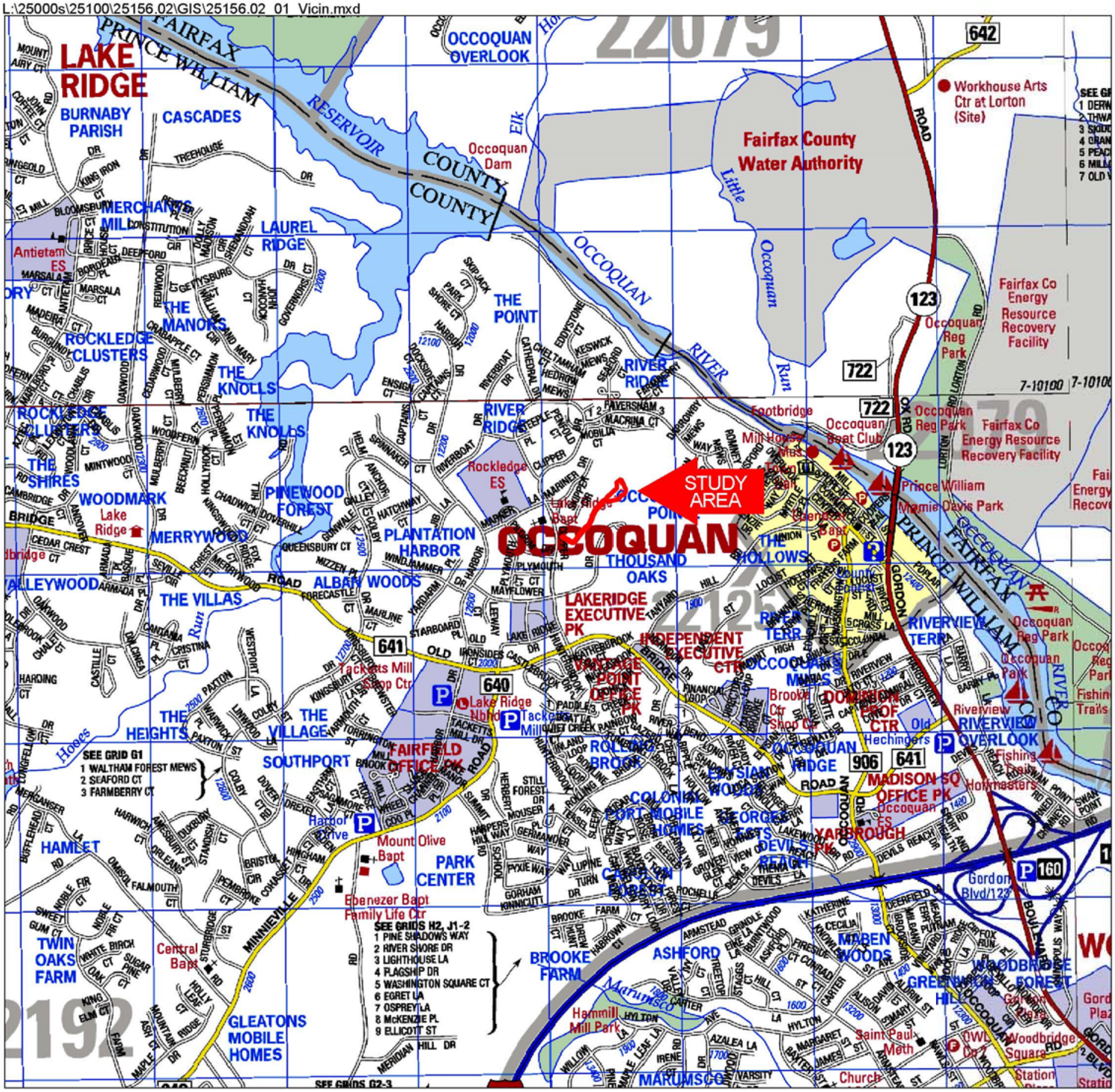

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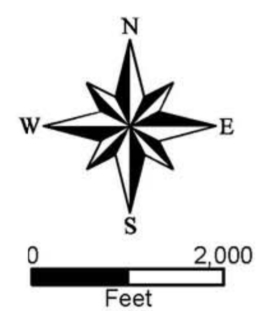
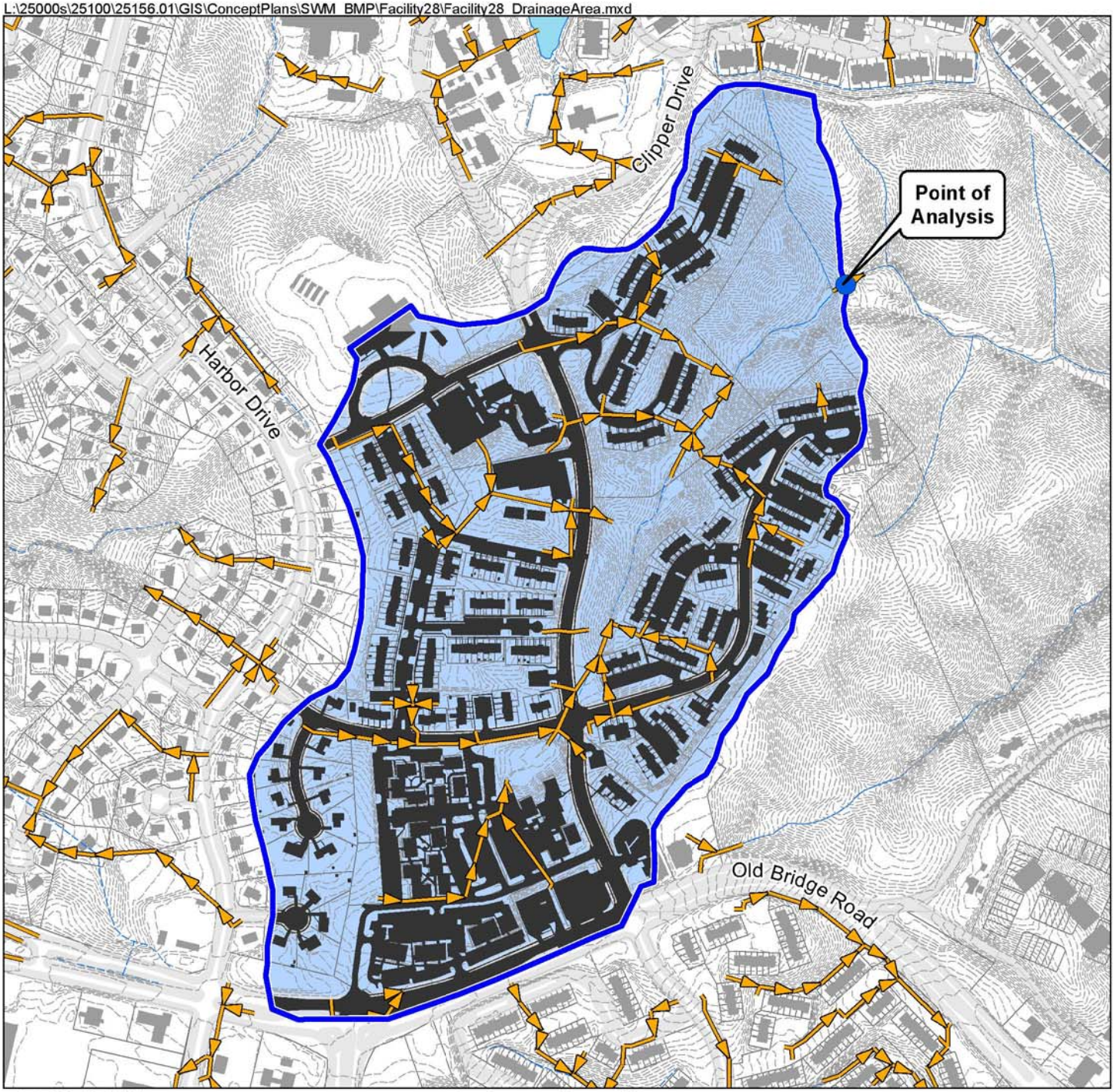
Vicinity Map
Occoquan Watershed -SWM Facility 28
WSSI #25156.02
Original Scale: 1" = 2000'



Wetland Studies and Solutions, Inc.
a DAVEY company

Exhibit 1

L:\25000s\25100\25156.01\GIS\ConceptPlans\SWM_BMP\Facility28\Facility28_DrainageArea.mxd



Lat: 38° 41' 3.5" N
Long: 77° 16' 15.5" W

- Drainage Area = 90 ac.
- Impervious Areas within Drainage Area = 40%
- Prince William County Roads
- Prince William County Buildings
- Prince William County Streams
- Prince William County 2' Topography
- Prince William County Parcels
- Storm Sewer Pipe

Drainage Area Map
Prince William County Digital Data
Occoquan Subwatershed Study
Conceptual Plan - Facility 28
WSSI #25156.01
Original Scale: 1" = 500'

N
W E
S

0 500
Feet

Wetland Studies and Solutions, Inc.

SWM/BMP Facility 28 Site Photographs

Facility 28. Downstream view of existing sediment basin with riser structure

Facility 28. Upstream view of existing sediment basin with riser structure

Reduction Calculation Summary
May 1, 2016

SWM Facility #28 **Wet Pond-Level 1**

1 Determine existing published efficency

BMP Type	Source	TN	TP	TSS
Dry Detention Pond	CBP	5%	10%	10%

2 Apply downward modification to BMP Efficiency

Facilty Name	BMP Type	Lat	Long	Modification Type	Downward Modification Applied
SWM Facility #28	Dry Detention Pond	38.7856	-77.5102	No sediment forebay	-10%
				No micropool	-10%
				Total	**-20%**

3 Calculate modified existing efficiency

		TN	TP	TSS
Published Efficiency	Step 1	5%	10%	10%
Efficiency Modification	Step 2	-20%	-20%	-20%
Modified Efficiency		**4%**	**8%**	**8%**

4 Determine efficiency of proposed BMP Type

Source	BMP Type	TN	TP	TSS	
Bay Program Retrofit Equations	Wet Pond-Level 1	12%	19%	24%	Rounded to lowest whole number

Runoff storage (acre-feet)	0.39	(Final Design)
Impervious acres	26.18	
Runoff depth	**0.18**	

Retrofit Equation Results

TN	12.36%
TP	19.42%
TSS	24.73%

5 Calculate Incremental Removal Rate

		TN	TP	TSS	
Removal Rate	Wet Pond-Level 1	12%	19%	24%	Bay Program Retrofit Equations
Modified existing efficieny	Step 3	4%	8%	8%	
Incremental Removal Rate		**8%**	**11%**	**16%**	

6 Calculate Load Reduction

Subsource	Pollutant	2009 EOS Loading Rate (lbs/acre/yr)	DA	Load	Efficiency	Reduction	Sub-total/POC
Regulated Urban Impervious	Nitgrogen	16.86	26.18	441.39	8%	35.31	
Regulated Urban Pervious	Nitgrogen	10.07	31.81	320.33	8%	25.63	**68.12**
Regulated Forest	Nitgrogen	5.29	16.97	89.77	8%	7.18	
Regulated Urban Impervious	Phosphorus	1.62	26.18	42.41	11%	4.67	
Regulated Urban Pervious	Phosphorus	0.41	31.81	13.04	11%	1.43	**6.34**
Regulated Forest	Phosphorus	0.13	16.97	2.21	11%	0.24	
Regulated Urban Impervious	Total Suspended Solids	1,171.32	26.18	30,665.16	16%	4,906.43	
Regulated Urban Pervious	Total Suspended Solids	175.80	31.81	5,592.20	16%	894.75	**6,018.15**
Regulated Forest	Total Suspended Solids	79.91	16.97	1,356.07	16%	216.97	

7 Reduction Summary Table

Project Name	BMP Type	Lat	Long	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
SWM Facility #28	Wet Pond-Level 1	38.7856	-77.5102	68.12	6.34	6,018.15

Appendix C - Roadways

Appendix D – Pesticide Herbicide and Fertilizer Application

Reporting

Mosquito Treatment | Adult ID | Larva ID | Gypsy Moth | Cankerworm | Adult ID Export | Mosquito Pools Log
Generic Pest Export | Mosquito Treatment Export | Cankerworm Export | Gypsy Moth Export | Site Visit Export | Site Type Export

From:
07/01/2016

To:
06/30/2017

Technician:

Map page:

Site type:

- [ ] Site Visit
- [x] Non-SWM
- [ ] SWM
- [ ] Other

Mosquito Treatment Report

This data is filtered by the following parameters:

From
07/01/2016
To
06/30/2017
Site Type
Non-SWM

Treatment summary

2583 total inspections

765 total treatments

11.955069559228651 acres treated

Reporting

Mosquito Treatment | Adult ID | Larva ID | Gypsy Moth | Cankerworm | Adult ID Export | Mosquito Pools Log
Generic Pest Export | Mosquito Treatment Export | Cankerworm Export | Gypsy Moth Export | Site Visit Export | Site Type Export

From:
07/01/2016

To:
06/30/2017

Technician:

Map page:

Site type:
- [ ] Site Visit
- [ ] Non-SWM
- [x] SWM
- [ ] Other

Mosquito Treatment Report

This data is filtered by the following parameters:

From
07/01/2016
To
06/30/2017
Site Type
SWM

Treatment summary

3191 total inspections.

465 total treatments.

4.612215564738292 acres treated.

Reporting

Mosquito Treatment | Adult ID | Larva ID | Gypsy Moth | Cankerworm | Adult ID Export | Mosquito Pools Log
Generic Pest Export | Mosquito Treatment Export | Cankerworm Export | Gypsy Moth Export | Site Visit Export | Site Type Export

From:
07/01/2016

To:
06/30/2017

Technician:

Map page:

Site type:
Site Visit | Non-SWM | SWM

Mosquito Treatment Report

This data is filtered by the following parameters:

From
07/01/2016
To
06/30/2017

Treatment summary

5774 total inspections.

1230 total treatments.

16.567285123966943 acres treated.

Standard Operating Procedure

Department of Public Works

Environmental Services Division

Title:	Insecticide Storage, Disbursement, Transport and Inventory
Number:	3.017.7
Subject:	Procedures for Insecticide Storage, Disbursement, Transport and Inventory
Cross Reference:	APWA Management Practice (s) 28.4
Date Issued:	May 3, 2010
Date Revised:	June 30, 2015
Date Last Reviewed:	June 30, 2015
Signature of Issuer:	Marc T. Aveni Marc T. Aveni, Environmental Services Division Chief
Applicability:	Environmental Services Division
Effective Date:	June 30, 2015

A. Purpose

The purpose of this standard operating procedure (SOP) is to establish a guide for the storing, handling, and disbursement of insecticides.

B. Applicability

This SOP applies to all employees of the Mosquito and Forest Pest Management Branch (MFPM).

C. Guidelines

Storage: Insecticides such as solid and liquid larvicides, and insecticide tank flush used in the program are stored in the Mosquito Shed located at the MFPM building. Insecticides used on a regular basis during the mosquito season may be held in County vehicles. The liquid adulticide is stored off site at the Operations Building in two roll top hardcover drum storage pallets with drains. The pallets rest on a 4-inch concrete slab. Each drum storage pallet is properly labeled.

Disbursement: Larvicides and adulticides are distributed on an "as needed basis". Technicians pick up the larvicide or adulticide. The amount of material that is taken is recorded on an inventory sheet located at the storage sites. The inventory at the storage sites is managed by the Field Supervisor.

Transport: Insecticides must be secured while being transported in County trucks.

Disposal of Empty Insecticide Containers: Empty larvicide bags can be disposed of in the trash. Empty adulticide insecticide containers are picked up by the vendor they were purchased from. Always refer to the Product Label before disposal.

Disposal of Unwanted Insecticide Material: Expired and unwanted insecticides are identified by any staff member and turned over to the County's Hazardous Waste Contractor by the Field Supervisor.

Safety: Read and follow all instructions on Product Labels. SDS (see below) must also be reviewed.

Material Safety Data Sheets (MSDS): MSDS information on all insecticides in use may be found in the storage sheds, staff vehicles and in the department shared drive and the MSDS online portal. The Field Supervisor must ensure that all staff has access to the latest versions (in an electronic format) on an at least annual basis.

Chemical Spill: If the amount is less than 1 gallon, the operator will contain and clean up the spill. The operator must also notify MFPM's on-call person immediately after the clean-up. If the amount is greater than 1 gallon, the operator will contain the spill as best as possible and immediately notify MFPM's on-call person. If the situation is deemed to be a hazardous materials emergency by the on-call person, he/she must call 911.

Pesticide Accidents: Pesticide accidents or incidents that constitute a threat to any person, to public health or safety, and/or to the environment must be reported to the VDACS Office of Pesticide Services. Initial notification must be made by telephone within 48 hours of the occurrence; a written report describing the accident or incident must be filed within 10 days of the initial notification. The above is the responsibility of the Field Supervisor and in his/her absence, the Mosquito and Forest Pest Management Branch Chief (Branch Chief). Additionally, it is their responsibility to notify Finance-Risk Management within 24 hours of a spill that is above the thresholds established by this agency.

Spill Response: All vehicles and storage facilities will contain spill kits suitable to address pesticide spills. All staff that use or may potentially come into contact with pesticides will undergo training on spill response.

D. **Authority**

The approving authority for this SOP is the Environmental Services Division Chief. Any changes to or deviations from this SOP must be approved by the Environmental Services Division Chief.

E. **Administration**

The administration of this SOP shall be the responsibility of the Mosquito and Forest Pest Management Branch Chief.

Standard Operating Procedure

Department of Public Works

Environmental Services Division

Title:	Adulticiding
Number:	3.017.2
Subject:	Adulticiding
Cross Reference:	APWA Management Practice (s) 28.2
Date Issued:	May 3, 2010
Date Revised:	June 30, 2015
Date Last Reviewed:	June 30, 2015
Signature of Issuer:	Marc T. Aveni Marc T. Aveni, Environmental Services Division Chief
Applicability:	Environmental Services Division
Effective Date:	June 30, 2015

A. Purpose

The purpose of this standard operating procedure (SOP) is to establish a guide to mosquito spraying operations. It is established to ensure that targeted spraying is conducted; it also ensures that adequate safety measures and EPA guidelines on the application of chemicals are followed.

B. Applicability

This SOP applies to all employees of the Mosquito and Forest Pest Management Branch (MFPM).

C. Adulticiding Process

Adulticiding may be triggered by high mosquito trap counts for specific species (mainly Culex pipiens and Cx. restuans) and positive West Nile virus pools in residential areas. The decision to spray is further determined by species composition, presence or absence of non-participants, weather, location, proximity to human habitation and housing density among other factors. Adulticiding is conducted in the spray block where the infected mosquitoes were collected. Additional areas may be treated based on proximity to the trap site associated with the positive pools.

The program does not generally spray based on the density of the Asian Tiger Mosquito (Aedes albopictus) or other container breeders. In exceptional cases where highly pestiferous species are present in huge numbers (as evidenced by trap data) such as Psorophora spp., spray may also be justified. Furthermore, the branch generally does not spray if it is raining continuously, extreme heat, high winds or Code Red conditions. It is recommended that the sprayer is turned off at a distance of 100 feet from non-participants (NPs).

Citizens are allowed to opt-out via email or phone call if they do not want their property to be sprayed. This non-participant database is maintained by the Field Supervisor and updated annually. Spray block maps include this information when it becomes available.

A public notification is published on the day of spraying once the decision is made to spray. The County's website and telephone hotline (voice recordings) are used as the medium for public notification. The public notification lists the blocks to be sprayed and information on how to access spray block maps on the County Mapper XM.

MFPM has two designated spray trucks both of which are equipped with a spray machine. The Field Supervisor is responsible for general vehicle maintenance and spray machine calibration to ensure that the vehicles are in a state of readiness to be deployed during the mosquito season. Each vehicle is also equipped with a Spill Kit which must be checked before each spray operation by the sprayer.

Once a spray operation is assigned, the sprayer/driver may request additional staff support. The driver operates the fogger machine while the second person is required to assist with navigation and alert the driver of any impending danger that might not be immediately visible to the driver. A paper map of the spray route is prepared by the GIS Analyst and made available to the vehicle operator.

MFPM uses Sentinel GIS which runs on ESRI's ArcPad to track and map areas sprayed. GIS data layers (spray route, spray block & NPs) are prepared at the office by the GIS Analyst and then deployed to a handheld Field PC. This device is then attached to the vehicle's control box which is equipped with a GPS. At the end of the spray session the device is disconnected and returned to the office. The data collected is uploaded to GIS and is used to create a spray information map showing the spray line and GPS points indicating when the sprayer was turned on and off. A detailed spray report is produced after the spray operation on the quantity of chemical used, the acreage sprayed and spray activity times and made available to the Field Supervisor and Mosquito and Forest Pest Management Branch Chief (Branch Chief).

D. Chemical Spills

If the amount is less than 1 gallon, the operator will contain and clean up the spill. The operator must also notify the MFPM's on-call person immediately after the clean-up. If the amount is greater than 1 gallon, the operator will contain the spill as best as possible and immediately notify MFPM's on-call person. If the situation is deemed to be a hazardous materials emergency by the on-call person, he/she must call 911.

Pesticide accidents or incidents that constitute a threat to any person, to public health or safety, and/or to the environment must be reported to the VDACS Office of Pesticide Services. Initial notification must be made by telephone within 48 hours of the occurrence; a written report describing the accident or incident must be filed within 10 days of the initial notification. The above is the responsibility of the Field Supervisor and in his/her absence, the Branch Chief. Additionally, it is their responsibility to notify Finance-Risk Management within 24 hours of a spill that is above the thresholds established by this agency.

All vehicles and storage facilities will contain spill kits suitable to address pesticide spills. All staff that use or may potentially come into contact with pesticides will undergo training on spill response.

E. Authority

The approving authority for this SOP is the Environmental Services Division Chief. Any changes to or deviations from this SOP must be approved by the Environmental Services Division Chief.

F. Administration

The administration of this SOP shall be the responsibility of the Mosquito and Forest Pest Management Branch Chief.

Appendix E – Illicit Discharges and Improper Disposal

Trackdown Report

Robert Jocz
5 County Complex Court
Prince William VA, 22192

Tuesday, July 19, 2016

On July 19th, 2016 County staff observed a large (~20 gal) hydraulic fluid spill outside the Development Services Building at 5 County Complex Court. The spill was the result of a ruptured hydraulic fluid line belonging to a Bates Trucking garbage collection truck. The effective spill area was found to extend from up against the dumpster and nearby diesel generator, to along the loading dock area and out into the roadway surround the County Complex parking lots. The driver of the Bates trucking vehicle left the scene of the spill and drove the truck down to the baseball stadium, leaving a small line of hydraulic fluid along the way. The spill was first detected by County Buildings and Grounds staff, and preventative measures were put in place immediately before allowing discharge to reach the stormsewer system.

Figure 1: Photo of Discharge.

No trackdown was needed as the source of the discharge was observed before it was able to enter the stormsewer system.

Figure 3: Trackdown Photos

On scene of the discharge were PWC Watershed Management, Risk Management, Buildings and Grounds, and Fire Marshall Staff. Bates Trucking was contacted as the responsible party for the spill. It took 3 hours for Bates Trucking staff to arrive on scene to address the spill. Absorbent material was place on the spill by Bates Trucking, but no cleanup of the material took place. County staff were informed a certified environmental cleanup company was contracted by Bates to complete the job; however, by the morning of July 20th no such company arrived. Communication with the company bates reported to the County as contracted to complete the cleanup, informed County staff that they had not received a retainer from Bates to clean up the spill, and therefore were not responding to the spill. At this point County staff contracted Atlas Environmental to complete the cleanup. Atlas arrived on site on July 20th and completed the cleanup of the hydraulic fluid spill. The Prince William County Fire Marshalls office issued 2 violations for leaving the scene of a spill. As the FMO took the lead on the case, and no material entered the stormsewer system, no NOV was issued to Bates trucking. Since cleanup of the spill has taken place, this case is considered closed.

Trackdown Report

Prem Poudel
Environmental Compliance Inspector

Famous Daves Restaurant
2430 Prince William Parkway
Woodbridge, VA 22192
woodbridge@famousdaves.com
703-492-1300

Monday, July 18, 2016

At 10:42 pm on July 15, 2016 Environmental Services received an email from Doug McCabe, Captain PWC DFR, regarding a cooking oil spill. The discharge was first reported by Dr. Mike Clark of DEQ while on route to Famous Dave's Restaurant located at 2430 Prince William Parkway. Cooking oil was observed around the Famous Dave's Restaurant parking lot and along the road towards intersection of Caton Hill Road and Killarney Drive. The site was inspected by PWC staff on 18th July, 2016. Upon arrival, oil stains were observed to have dried and vehicular tracks were observed to spread the discharge on connected roads.

Figure 1: Map of Discharge.

Following the inspection, a meeting was made with Mr. Florentino Perez, the manager of Famous Dave's Restaurant. He was not on duty while the incident occurred. As per his employee, the spill could be attributed to improper handling of material during pickup. The truck had been driven without closing the control valve of the tanker. Valley Protein Company was notified of the incident by the restaurant Manager. Valley Protein Company sent their crews to disperse absorbent on spilled surface around the

restaurant in the evening of July 16th and applied power wash on 17th morning. The contact info of Valley Protein Company was shared by Mr. Perez.

Figure 2: Track down Photos

The mitigation activities were reported to be employed around the heavily spilled restaurant areas. The stain from the road and parking lot areas were partially dried and partially washed away by heavy rain of last week. The impact of incident on storm water and water of the county observed insignificant due to diluted volume. The educational materials including county ordinances will be sent to the Valley Protein Company for control repetition of such activities in future. NOV was not issued since the impact has been appropriately mitigated. Since the spill extended out of PWC's service area and onto VDOT MS-4 jurisdiction. VDOT was notified of the spill on Tuesday 7/19/16.

PRINCE WILLIAM COUNTY DEPARTMENT OF PUBLIC WORKS
WATERSHED BRANCH
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM
5 COUNTY COMPLEX COURT, SUITE 170
PRINCE WILLIAM, VA 22192-5308
OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

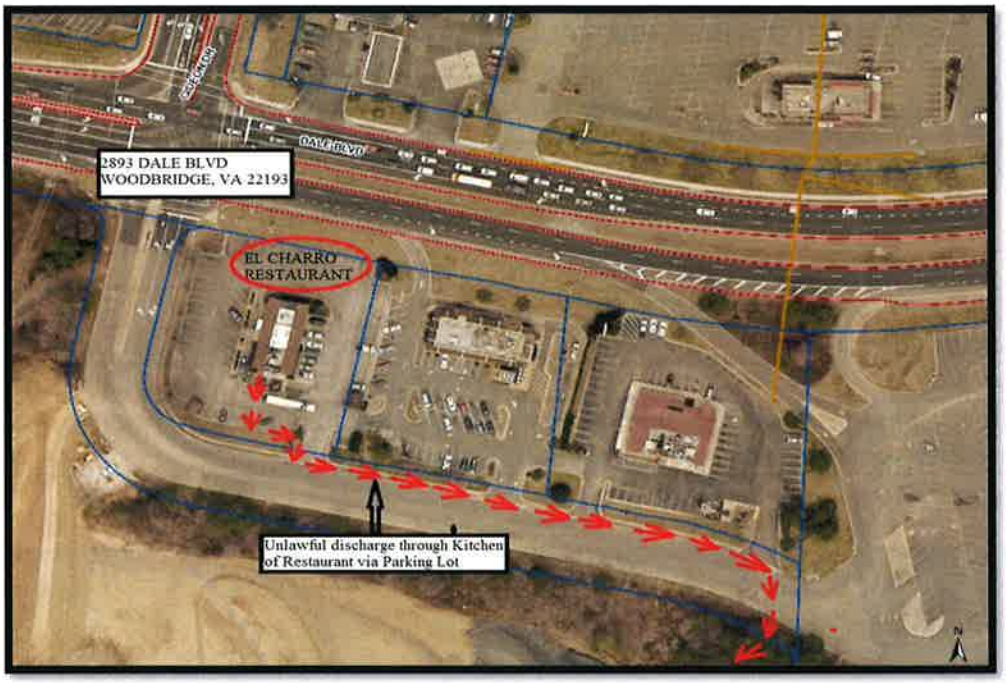
INCIDENT INFORMATION			
Incident Report #: 48-2017	Date : 5/19/2017		Time : 11:00 am
Business : EL CHARRO (Restaurant)		Report Completed By : Prem Poudel	
Address: 2893 Dale Blvd		City : Dale City	Zip Code: 22193
Case Detail: A citizen reported an illicit discharge from the El Charro restaurant into stormwater system located at 2891 Dale Blvd. Bad odor was being spread out at the surrounding area.			

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm): NA Limit:NA		Temp.: °F Limit: NA
Discharge related Indicators	Odor: Sanitary	Color: Other	Turbidity: Cloudy
	Floatables: NA	Stains: Oily	Deposits: Debris

Map of Trackdown Path:



Responsible Party (Owner/ Institutions)	**Other Party (Management Company)**
Name: Carlos Pineda (Asst. Manager)	Name: Mr. Daniel Gallardo (Manager)
Company: EL CHARRO (Restaurant)	Company: EL CHARRO (Restaurant)
Address:2893 Dale Blvd	Address: 2893 Dale Blvd
Phone #: 703-680-0484	Phone #: 703-680-0484
Note:	Note: Email- dinagallardo11@yahoo.com
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date:	Date:
Time:	Time:
Name:	Name:
Company/Agency:	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

A citizen reported a complaint regarding an illicit discharge into stormwater system from EL CHARRO restaurant located at 2893 Dale Blvd on 05/18/2017. Site was inspected on 05/19/2017. Upon arrival, parking lot was found to have a dry flow track with grease, oil and waste food stains directed towards the stormwater system. During the inspection I spoke with Mr. Carlos Pineda, the Asst. Manager of the restaurant. An illicit discharge was confirmed coming from the kitchen and directed towards the storm sewer system via parking lot and road curbs and gutters. The source of this problem was a blockage from the kitchen to the sanitary pipe. The discharge was temporarily seized to fix the problem collecting in a container but there was still a significant amount of oil, grease and waste food stains on parking lot with potential for being washed away into stormwater system during rainfall.

Conclusion:

The oil, grease and waste food stains needs to be cleaned and captured before being washed away into stormwater system. Notice of Violation (NOV#10-2017) has been issued to correct the deficiency on 05/19/2017. Mitigation plan needs to accomplish following activities.

1) Stop the source of illicit discharge into stormwater system immediately.
2) Clean debris and stains from flow path and capture cleaning chemicals and water without letting them flow into stormwater system as soon as possible.
3) Fix the blockage to stop further leakage of illicit discharge into stormwater system within 30 days.

Notifications:

Citation Code Section: 23.2-4.1		
Citation Narration: Illicit Discharge to the stormwater system and waters of the county.		
NOV Issued: Yes	NOV # :10-2017	EnerGov Case # : NA

Photos:






Trackdown Report

Prem Poudel
Environment Compliance Inspector

Outfall: 19640
3514 Old Bridge Rd
Woodbridge, VA 22192

Wednesday, December 14, 2016

Follow up to Hazmat incident # 160037797, the complain of suspected hazmat discharge was responded to Mr. Michael Clark from DEQ and the team of PWC, DFR lead by Mr. Matthew Schultz at 3514 Old Bridge Rd on Sunday, Dec 11, 2016 at 2:45 pm. The case occurred at an Exxon gas station and convene store with car wash. Watershed Management Branch has notified by Mr. Matthew Adkins DFR on 12/12/2016 at 10:08 am. Then the site was individually visited by the watershed Inspectors Mrs. Sandra Adams and Mr. Prem Poudel on 12/13/2014 and 12/14/2016 respectively. Upon arrival on site, a green color discharge was observed flowing through outfall 19640 towards downstream channel.

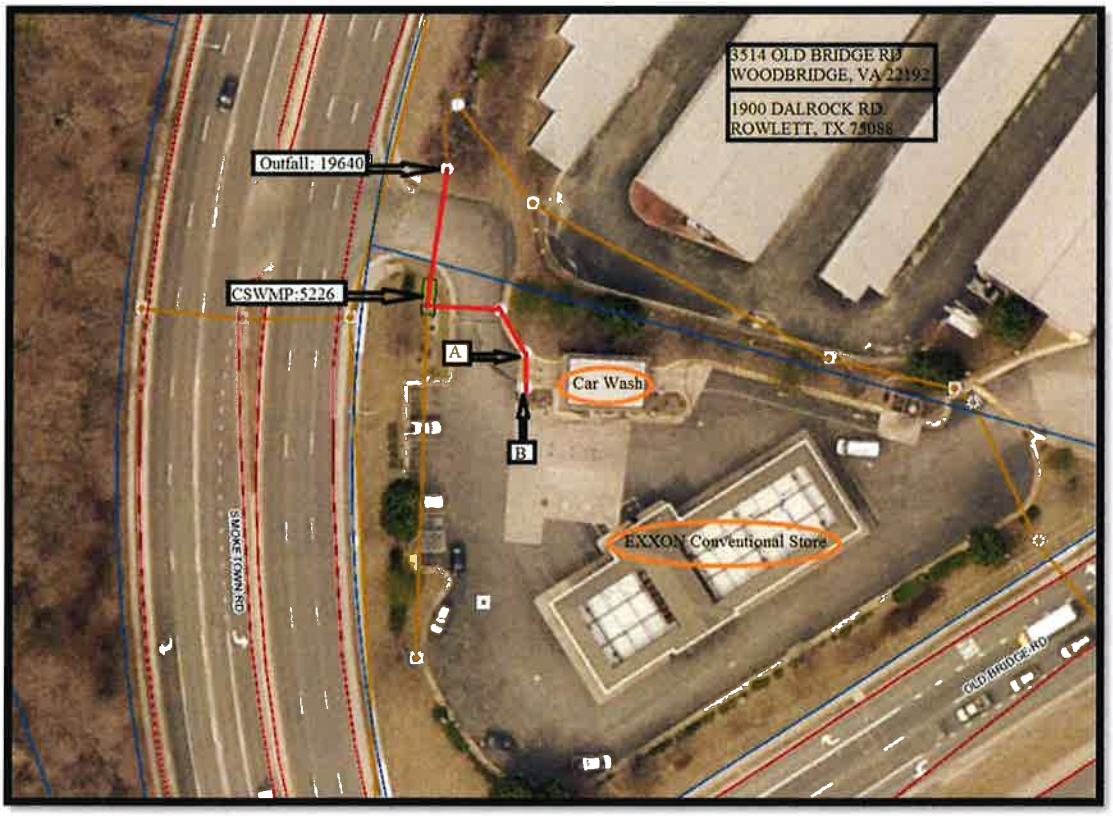


Figure 1: Site map showing discharge flow path through the storm sewer system.

Discharge was tracked down from the outfall of CSWM facility (ID:5226) located within the Exxon gas facility of Southside Oil LLC. The SWM facility contained three compartments. Among them upstream was full and overflowing through its upper crest to next two interconnected compartments. The color of water was a dense green as compared to the collected sample because of nontransparent beneath and

higher depth. A sample was collected from middle compartment of facility. The field test conductivity and pH were found to be within the standard limits. Tracking was continued up to points A and B which are manholes adjacent to the car wash facility. Both manholes contained green water up to the neck of the facility. Hence the source of discharge was ultimately confirmed to be from the car wash. Two possible contaminants were suspected. One, due to the green color, the discharge could be antifreeze. Two, the car wash uses an industrial and pressure cleaning chemical called "Simoniz Ultra". Following the investigation, meeting made with Mr. Jeff MacPherson, the owner of the business, as we notified that the owner of business was willing to run up cleaning activities for CSWM facilities and drainage system with the conversation with DFR officials on Sunday. For Inclusive legal and chemical investigations, as built plan of Exxon gas facility was pulled over and reviewed. The CSWM facility was pumped out on 12/20/2016. The car was discharge is supposed to be connected with sanitary sewer but it has vigilant to be connected with storm water management system while pumping.

The collected sample (ID: 5991J1-19640-1) was analyzed with desktop analysis on 12/14/2016. The Phenol, Chlorine, Fluoride and Copper were found to exceed the standard limits. Another sample was taken from the same place on 12/19/2016 and sent to H. L. Mooney Laboratory of PWCSA for inclusive investigation. Among tested parameters, two of them were found to be in exceedance and hence desktop analysis was verified.

The source of discharge was confirmed to be the car wash discharge containing soap, detergent and chemical with water. Notice of violation has been already issued by PWC DFR on 12/19/2016 and we are coordinating our responses. The camera van inspection was performed by county crews on 1/12/2017. Our goal with the camera was to try to help the owner identify the misconnection, but various impediments prevented a good view. A violation notice (NOV 6-2017), citing Sec. 23.2-4.1(a)4 has issued on 01/12/2017 to the business owner to comply deficiency with following action plan.

1) Immediately cease car wash discharge into storm sewer system.
2) Disconnect car wash discharge pipe, connect with storm sewer system within 30 days of NOV received date.

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WATERSHED BRANCH
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM
5 COUNTY COMPLEX COURT, SUITE 170
PRINCE WILLIAM, VA 22192-5308
OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

INCIDENT INFORMATION		
Incident Report #: 45-2017	Date : 5/22/2017	Time : 3:30 PM
Business : Old Hickory Golf Course/ River Fall HOA	Report Completed By : Prem Poudel	
Address: 4656 Asdee Ln	City : Woodbridge, VA	Zip Code: 22192
Case Detail: PWC IDDE staff got a complaint about petroleum spill into stormwater system.		

Photo of discharge:

Onsite Water Quality Test performed: Choose an item. If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm):NA Limit:NA	Temp.: °F Limit: NA	
Discharge related Indicators	Odor: NA	Color: NA	Turbidity: NA
	Floatables: NA	Stains: Oily	Deposits: Debris

Map of Trackdown Path:

Responsible Party (Owner/ Institutions)	Other Party (Management Company)
Name:	Name:
Company: Old Hickory Golf Course LLC	Company: River Falls HOA
Address: 4656 Asdee Ln, Woodbridge VA 22192	Address:
Phone #: (703) 580-9000	Phone #: 703-580-6636
Note:	Note:
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date: 05/23/2017	Date:
Time:12:30 PM	Time:
Name: Richard Tuomala	Name:
Company/Agency: VDOT	Company/Agency:
Notes: email- Richard.tuomala@vdot.virginia.gov	Notes:

Comments/ Deficiencies:

On May 22, 2017, PWC IDDE staff received a complaint from VDOT staff Mr. Richard Tuomala regarding petroleum spill into storm water drop inlet at 4656 Asdee Ln. The site was visited on 05/22/2017. The spill incident may happened due to accident. River Fall HOA or Old Hickory Golf Course LLC already solved the problem prudently. By the visual inspection, earthen dam with sand was supposed to be made to capture the discharge on site. The riprap, contaminated with spill was totally replaced with new stones. Petroleum absorbent hydrocarbon booms were observed to be installed at outfall and drop inlet. There was no bad impact on downstream outfall and creek.

Conclusion:

The spill was prudently captured and cleaned to abate bad impact on downstream creek. NOV did not issue and case closed.

Notifications:

Citation Code Section: NA		
Citation Narration: NA		
NOV Issued: NO	NOV # : NA	EnerGov Case # : NA

Photos:

Trackdown Report

Prem Poudel

Louis Birdsong
5157 Olivia WY
Woodbridge VA, 22192

Friday, July 22, 2016

Figure 1: Photo of Discharge.

On July 22, 2016 Pat McGuire, Prince William County Drainage Crew Supervisor, entered a complaint concerning the dumping of paint and plaster into storm sewer system at 5157 Oliva Way. The field investigation was made on same day. The storm water drop inlet was located inside the property. Mrs. Rebecca Birdsong was at home and helped to investigate the problem. Household waste paper was found to be used for making paper bricks in their house. The paper brick was found to produce paper paste through the mixing and stirring of paper waste with water. Excess water was found to be squeezed out of the paste after pouring paste into mold. Homeowners were doing this above the grate lid on the storm water drop inlet. According to Mrs. Birdsong, brick fabrication occurs once a week. Process water including some paper debris was observed to be discharged into storm water system.

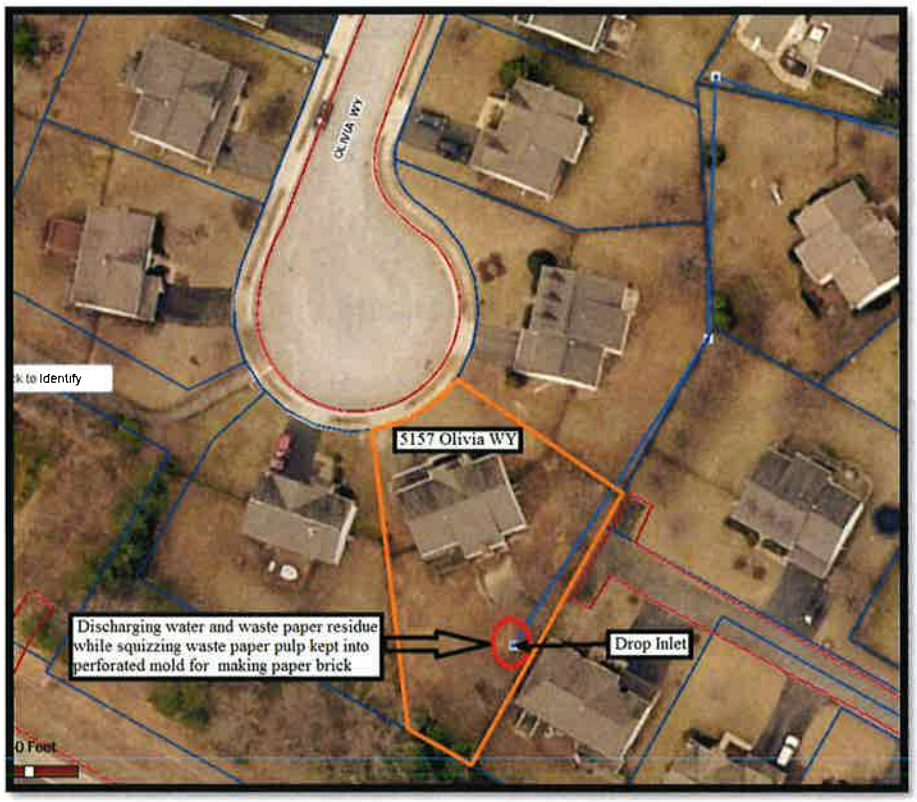

Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

The discharge of process water and paper debris is a violation of county ordinance as per Sec. 23.2-4, but the scale of discharge was minor and Mrs. Birdsong agreed to stop discharging paper debris and process water in the future, as well as clean up the debris from drop inlet trash rack. For these reasons an NOV was not issued. Follow up inspections will be continued to make sure such actions are not repeated again. If an unlawful discharge is observed discharging into storm sewer system in future, an NOV will be issued.

Follow up-inspection

The follow up inspection was made on 08/16/2016. Further activities for discharging paper debris and paper brick process water were stopped so the case has been closed now.

Trackdown Report

Prem Poudel

Northern Virginia Material Recovery Facility
7911 Notes Drive
Manassas, VA 20109

Thursday, January 05, 2017

Figure 1: Photo of Discharge.

On Jan 4, 2017 PWC Watershed received a case regarding an illicit discharge generated by Northern Virginia Material Recovery Facility (Republic Services) from the Captain Mr. Brian Ferguson of Fire Marshal Office. It was reported that the recycling facility is well beyond capacity with material stored outside. During the recent rain event, water was observed flowing off of the pile of debris and into the storm water drains onsite. Moreover, the property has received numerous complaints and violations so the Fire Marshall is going to actively pursue criminal charges against the facility.

The reported site was visited same day. On arrival, rain stopped from last day and most of the pile of recycling materials was already pushed into recycling plant. Debris and residue were observed on front yard having storm water drop inlet.

On Jan 5th, large stock pile was again observed piled out of the roof at 2:30 PM. Onsite meeting was organized in between stakeholders by DFR. Following meeting, Joint inspection was made with Captain Mr. Brian Ferguson, Lieutenant Mr. Mike Hubbel from DFR, the Property Code Inspector Mr. Huffman Celli from Neighborhood Services, the Building Code Inspector Mr. Andrew Kellerman from Building Division, Mr. Clay Morris and me from Watershed Branch and from the facility side the Division Manager Mr. Tim Kinnett, the General Manager Daniel P. Dumas, the Environmental Manager Mr. Timothy Torrez (PE), the Environmental Specialist Mr. Michael Easter. Mr. Dumas has claimed multiple improving works carried out into the facility since they had taken this facility and willing to do improvement work in future as well.

The storm water outfalls were inspected. An outfall 30921 was flowing because of open channel flow

along railway track. This outfall commands the drainage areas of facility joints with Notes road runoff and open channel flow along railway trail. There was no flow through the facility except open channel. Another outfall 30908 is solely associated with recycling facility but it had trickle flow due to stagnant water due to weir made across the outfall flare. The storm sewer A-B has been working as a settling basin between drop inlet and metallic weir. This discharge doesn't represent the real constituents with compared to the wet weather sampling so further test is avoided. Processed cubes of recycling materials were stacking along roof drip line which prone to wash away and run overland during rain events.

On 6th Jan, again meeting was made among all county's stakeholders and it has shared that there are numerous violation of Fire and Rescue Code, Building Code, Zoning Code. After reviewing the VPDES permit (VAR052074) document received from DEQ, facility's activities of stacking cubes placed over the roof drip line and exposed piles for rain events for long time are responsible for generating an unlawful discharge to the storm sewer system and water of the county.

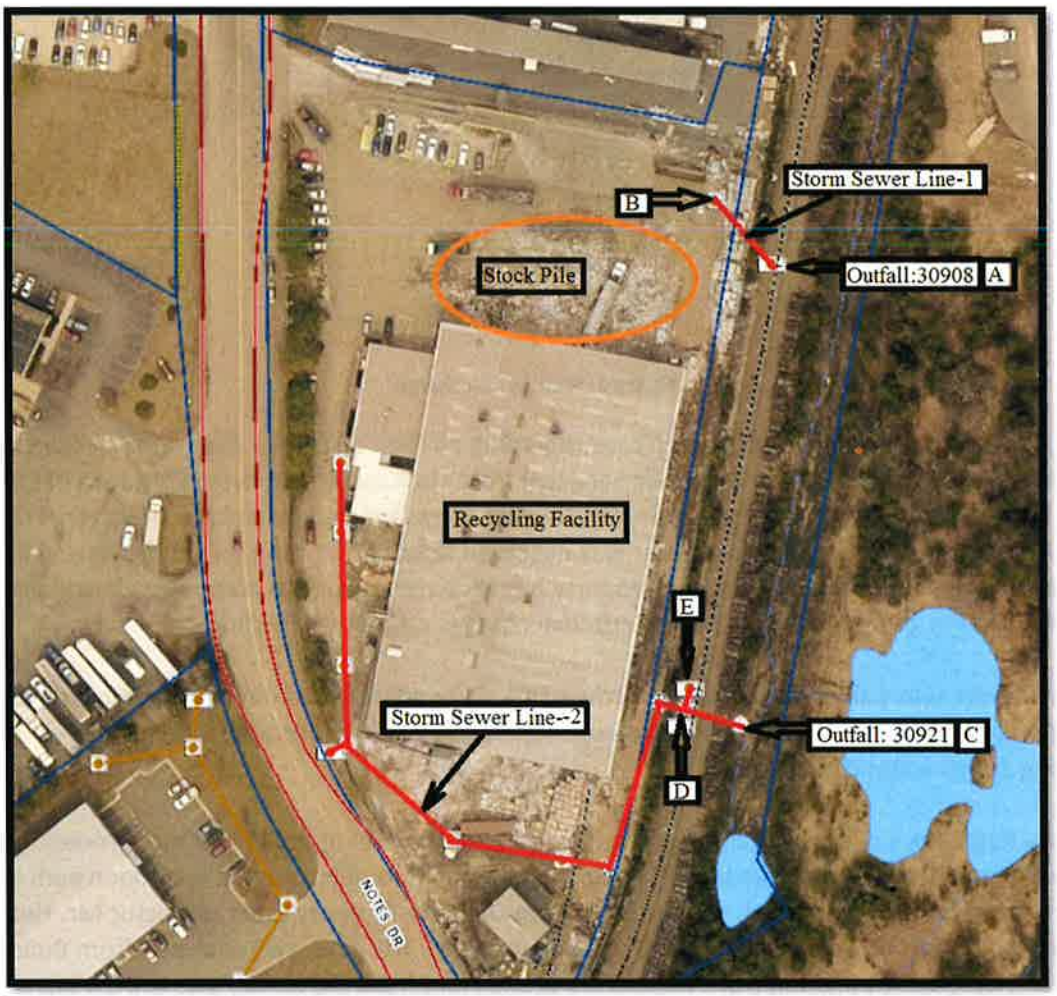

Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

Department of fire and rescue has already issued the notice of violations in fifteen different issues. Similarly, PWC building division had identified alteration and renovation of building facility without taking permit. Exposed recycling materials and product out of the roof for long time is being washed away and responsible for generating an unlawful discharge to the storm sewer system and water of the county which is also a violation of VPDES Permit VAR052074, Part IV C.2 (b) so the case has been forwarded to DEQ for further enforcement action.

Track down Report

Prem Poudel

Hernandez Benito
10021 Lomond Drive
Manassas, VA 20109

Thursday, September 15, 2016

Figure 1: Photo of Discharge.

On September 15th, PWC IDDE program received a complaint from Mr. Nathaniel Nagle, the Assistant Branch Chief of PWC Mosquito and Forest Pest Management regarding a suspected an illicit discharge. The discharge was described as having black color with bad odor and was found within a plunge pool located on the west and north ends of 10008 Lomond Drive 20109 where it meets with the school bus parking lot.

The field investigation was made on same day. Upon arrival, the plunge pool was confirmed to have a dark blue color with bad odor and was observed downstream of the outfall located behind the property 10008 Lomond Drive adjacent to Stonewall Middle School. The plunge pool was developed by sediment deposited around the outfall. The flow path after the berm indicated that the discharge had recently flowed through the outfall.

The source of the discharge was tracked from outfall following the colorful stains on surfaces of upstream sewers. The flow path was tracked along points A, B and C. The smell of detergent was easily noticeable in each manhole. The flow was tracked to 10021 Lomond Drive. No home owner was present at that time although a couple of visitors were at the home at the time. Permission was given from visitors to investigate the property. It was found that two pipes which supposed to be connected from the washer dryer to the sanitary sewer were connected with storm sewer inlet at point C. It was

confirmed that the intermittent flow had been received during laundry operations only. Field test of laundry discharge was performed on site and sample was collected for desktop analysis to identify the rest of water quality parameters.

Figure 2: Map of Track down Path

Figure 3: Track down Photos

The discharge generated from laundry operation is an unlawful discharge into storm sewer system and violation of county ordinance Section 23.2-4.1, NOV 5-2017 was issued to Mr. Benito, the home owner of 10021, to stop the discharge of laundry wash water into storm sewer system immediately, and remove the unauthorized connection to the storm sewer systems within 30 days. Further enforcement actions will be taken on failure to comply the deficiencies.

Mr. Benito reported the completion of corrected deficiency on 09/23/2016. A follow up inspection was made on 09/26/2016 and the deficiency was found to be corrected. It was confirmed that the black corrugated HDPE pipe was installed for rain water discharge from building and ground. The case has been closed as all required mitigation on the site has been completed.

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WATERSHED BRANCH
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM
5 COUNTY COMPLEX COURT, SUITE 170
PRINCE WILLIAM, VA 22192-5308
OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

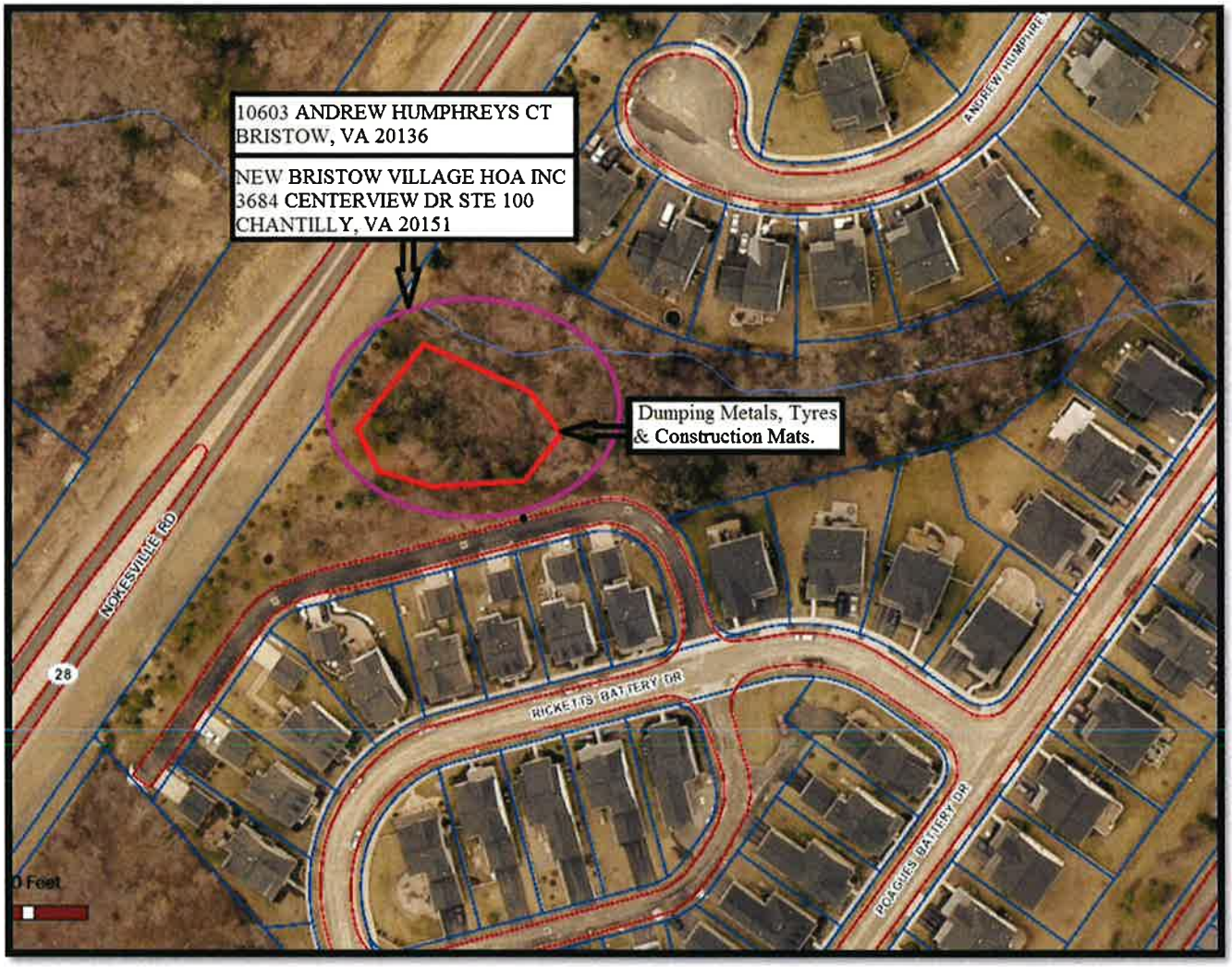
INCIDENT INFORMATION			
Incident Report #: 35/ 4-5-2017	Date : 3/10/2017		Time : 1:15 pm
Business : HOA Property/ Greenery open space		Report Completed By : Prem Poudel	
Address: 10603 Andrew Humphreys Ct.		City : Bristow	Zip Code: 20136
Case Detail: Dumping construction materials, sharp metal objects, tires, heavy machinery parts in the woods			

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm): NA Limit: NA		Temp.: _ °F Limit: NA
Discharge related Indicators	Odor: NA	Color: NA	Turbidity: NA
	Floatables: NA	Stains: NA	Deposits: Trash

Map of Trackdown Path:



Responsible Party (Owner/ Institutions)	**Other Party (Management Company)**
Name: Meghan Marville	Name:
Company: New Bristow Village HOA Inc.	Company:
Address: 11976 Bristow Virginia, VA 20136	Address:
Phone #: 703-257-9585	Phone #:
Note: mmarville@cmc-management.com	Note:
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date: 4/7/2017	Date:
Time: 8:24 am	Time:
Name: NA	Name:
Company/Agency: NSD	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

County staff visited site on 4/7/2017. Tires, motor parts, metals and construction debris were observed being dumped at woods behind the property 10599 Andrew Humphreys Court. Metals were rusted and sharp which could be harmful to the residents. There was high possibility for releasing pollutants from dumping waste with storm water and ultimately reach to the creek during rainfall. The violator could not identify during inspection. Dumping site is a HOA owned property, so case has been reported to the HOA Manager Ms. Meghan Marville on 4/10/2016. HOA has to maintain their property as per county code.

Conclusion:

Unless detecting the violator, HOA is responsible to mitigate the deficiencies by removing those trash and debris. The case was forwarded to HOA of New Bristow Village to clean and maintain the property. Follow up call was made with HOA Manager on 4/20/2016. Ms. Meghan said, HOA try to find the vender to fix the problem. Follow up action will be continued in future. The incident seemed to be happened continuously from long ago and HOA willing to resolve the problem after notifying them, NOV didn't issue.

Notifications:

Citation Code Section: 23.2-4.1		
Citation Narration: Unlawful Discharge to the stormwater system and water of the county.		
NOV Issued: NO	NOV # :NA	EnerGov Case # :NA

Photos:

Trackdown Report

Prem Poudel
Environmental Compliance Inspector

13116 Kittredge Court
Woodbridge, VA 22192

Tuesday, October 18, 2016

Figure 1: Photo of Discharge.

On October 18, 2016 citizen complaint was received at PWC Environment services regarding an oil spill on sidewalks and causing mess during oil change in street parking at the intersection of Kirkland Ct and Kittredge Ct. The complaint was specially made for resident of 13116 Kittredge Ct.

The site was visited same day. Upon arrival, several oil stain spots were observed on road parking beside the house 13116, 13114, 13115 and 13113 at Kittredge Court. Most of them were seemed to be leaked from old vehicles during parking and some of them by spilling during oil change. Oil stains were localized so that there was no flowing footprint on pavement towards storm sewer system.

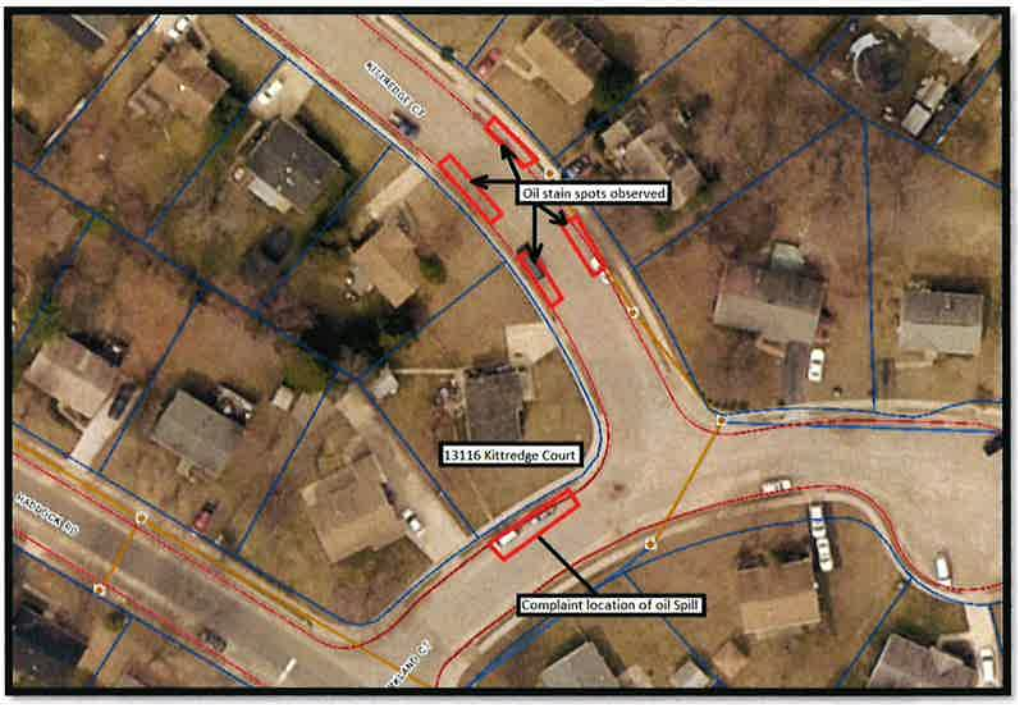


Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

No NOV was issued due to responsible party not being on seen and has no sound evidence for enforcement as well. Meeting was made with complainant and talked about the issue. The education materials were left over the aforementioned houses. Follow up inspection will be continued to control further oil spill in future.

Trackdown Report

Prem Poudel

13201 Worth Ave
Woodbridge, VA 22192

Wednesday, January 25, 2017

Figure 1: Photo of Discharge.

On January 25, 2017 PWC Environmental Services received a complaint from County Staff Mr. Lo Chao regarding a cooking oil spill while he was on route for county business at 13201 Worth Ave on January 24th.

The site was inspected by Environmental Compliance Inspector on 25th January. Upon arrival, grease and cooking oil was spilled over the pavement around the collection tank, located behind the TGI Friday and Bento Cafe Sushi restaurants. The waste food fluid was leaking through the compactor and flowing towards the storm sewer system. Grease and oil stains, observed on drive way and parking lot were potential for being washed way into storm sewer system during rain events. Poor waste handling practice, leaky container or overflow from under sized container could be the potential reason for incident. Significant amount of trash and litters were spread out on adjoining property (2681 Prince William PKWY), owned by the of same owner. Some of the trash may be released unintentionally during routine collection & hauling and possibly from individual consumers of the shopping center.

Following inspection, the incident was notified to both Manager on duty of TGI Friday and Bento Café and unable to meet Manager of America's Best Wings who generate and discharge fat and cooking oils. Education materials were hand over to make them aware about unlawful discharge into storm sewer system. It was determined that the Kimco Realty Corporation is responsible for managing shopping center. The management company has to identify and employ BMPs to avoid illicit discharge and keep trash control at point of generation to minimize the impact on the adjoining creek and pond.

Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

Discharging waste food fluids, fats, oils and grease to the storm sewer and water of the county is a violation of county ordinance as per sec. 23.2-4.1; a notice of violation (NOV 6-2017) is issued to the property owner or Management Company to correct the deficiencies within 30 days.

The abatement plan should proceed as follows:
1) Immediately cease discharge of waste food fluid, oil and grease into storm sewer system.
2) Clean stains and debris from the pavement being washed away into storm sewer system.
3) The management company has to identify and employ BMPs to keep trash control at point of generation to minimize the impact on the adjoining creek and pond.
4) Maintain integrity of waste collection compactor and oil container to stop further leakage, and avoid potential illicit discharge being washed away into storm sewer system.

Trackdown Report

Prem Poudel

BSI Real Estate Holdings LLC
13426 Occoquan Rd.
Woodbridge, VA 22191

Wednesday, November 16, 2016

On November 15, 2016 a case of dumping down storm drain at 13426 Occoquan Road was forwarded to Environment service, IDDE staff by the Fire Marshal Captain Kim Stewart at 5:02 PM. Moreover, the incident was cached live and immediately talked to owner and contractor to stop discharging turbid water and sludge into storm sewer systems.

Figure 1: Photo of Discharge.

The site was inspected on Nov 16, 2016. Upon arrival, the facility was found to be rented for FedEx and closed. The manhole of storm sewer systems, located beside the house was opened. The sludge stain was observed on wall and floor like a thin paint. The surrounding of curb and gutter inlet was observed wet. The storm sewer system was tracked and found no flow through outfall towards ground swale. The storm sewer system was seemed to be old and didn't updated in county mapper as well.

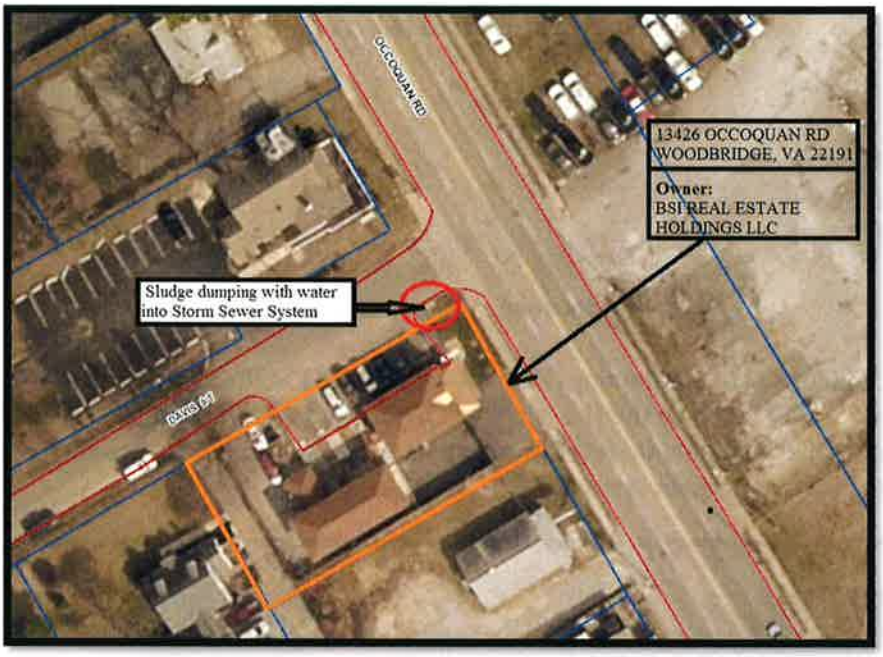


Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

The source of discharge should be generated with minor renovation into the building. The case was seemed to be prudently handled onsite by Kim to stop further discharge into storm drain systems. The impact of discharge into storm sewer system was insignificant and there was no flow through outfall towards downstream swale. The incident was single time event and Mr. Kim. Already award to the owner about unlawful activities. For these reasons, NOV was not issued.

PRINCE WILLIAM COUNTY DEPARTMENT OF PUBLIC WORKS
WATERSHED BRANCH
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM
5 COUNTY COMPLEX COURT, SUITE 170
PRINCE WILLIAM, VA 22192-5308
OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

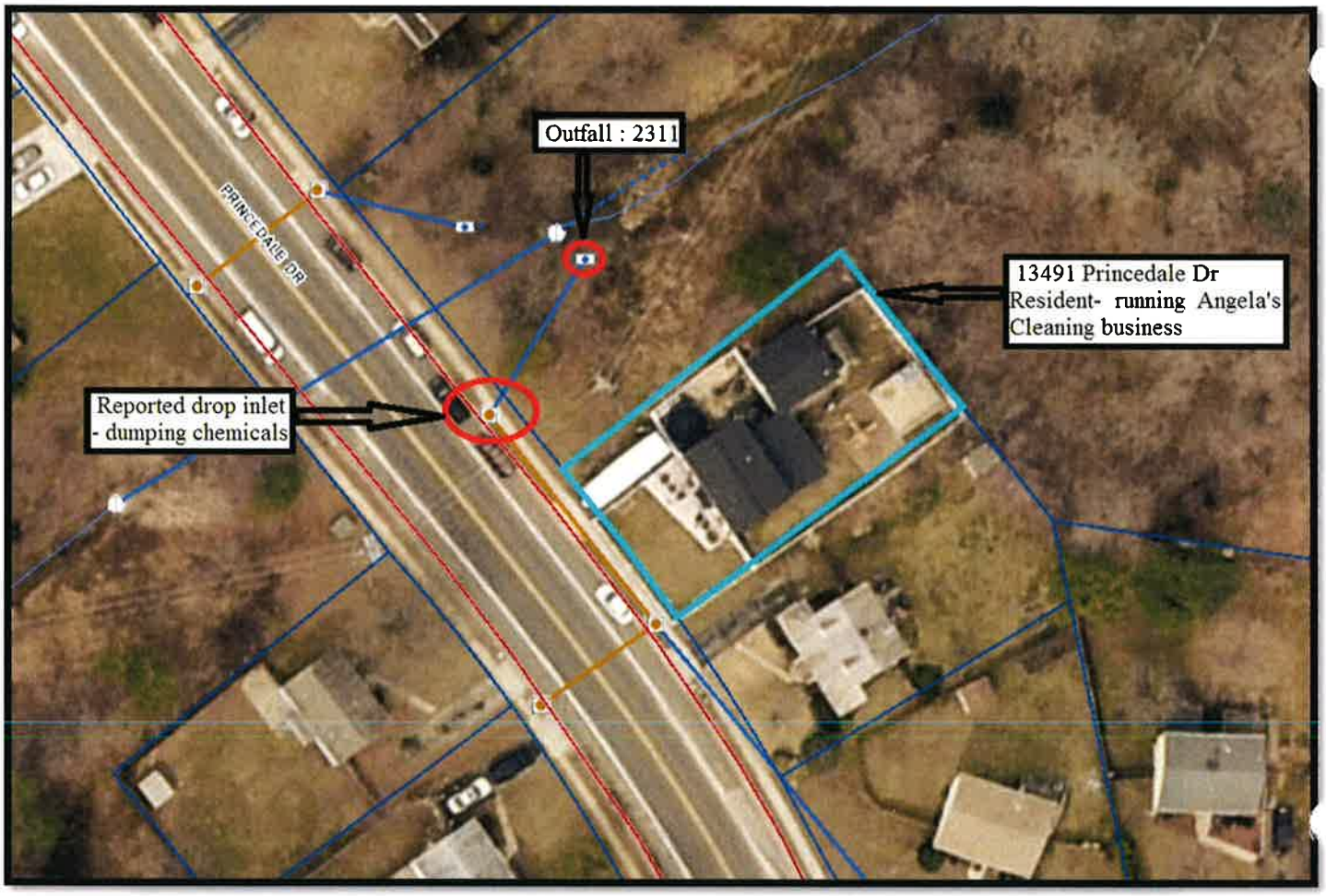
INCIDENT INFORMATION		
Incident Report #: 39/ 04-25-2017	Date : 3/10/2017	Time : 3:00 pm
Business : Dumping chemicals at storm sewer system	Report Completed By : Prem Popudel	
Address: 13491 Princedale Drive	City : Woodbridge, VA	Zip Code: 22193
Case Detail: Angela's cleaning service was anonymously reported for dumping cleaning chemicals from their vans and cars down into the stormwater inlet, located nearby their house 13491 Princedale Drive.		

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm): NA Limit:NA	Temp.: _ °F Limit: NA	
Discharge related Indicators	Odor: NA	Color: NA	Turbidity: Slightly Cloudiness
	Floatables: Suds	Stains: NA	Deposits: NA

Map of Trackdown Path:



Responsible Party (Owner/ Institutions)	**Other Party (Management Company)**
Name:	Name:
Company: Angela's Cleaning Services	Company:
Address: 13491 Princedale Drive	Address:
Phone #:(703) 543-5554	Phone #:
Note:	Note:
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date:	Date:
Time:	Time:
Name:	Name:
Company/Agency:	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

The complaint site was inspected on same day. As per complainant, the owner of both 13491 Princedale Drive and Angela's Cleaning is the same. It was hard to investigate dumping incident since everything had been washing away due to heavy rain continuing from last two days. The corresponding outfall discharge was observed with some white suds and orange pipe algae. From our previous records, the outfall was observed to be dry on 2/4/2013 and 3/12/2016 respectively.

During investigation, undersigned try to reach out the business owner at 13491 Princedale Drive but there was no responsible owner except visitor.

Conclusion:

The complaint was briefly describe with visitor to convey massage to the owner. Moreover, the informative education materials will be mailed to the cleaning company regarding unlawful discharge into storm sewer system and to make them aware on its consequences with legal and enforcement actions to mitigate the deficiency if happened in future. Follow up inspection will be continued to investigate the problems.

Notifications:

Citation Code Section: 23.2-4.1		
Investigation will be continued to identify the reported unlawful discharge to the stormwater and waters of the county.		
NOV Issued: NO	NOV # :NA	EnerGov Case # : NA

Photos:

Trackdown Report

Prem Poudel

Bryan Livengood
14514 Silverdale Drive

Thursday, July 21, 2016

Figure 1: Photo of Discharge.

A citizen complaint concerning the dumping of woodchips into the storm sewer system at property 14514 Silverdale Drive was received at PWC Neighborhood Services. The case was forwarded to Environmental services by Paul Lynch on July 21, 2016 and a field investigation was made on same day. A tree cutting company was employed by Mr. Bryan Livengood, owner of 14514 silverdale drive, to cut down a tree from his front yard. Wood chips and other debris were observed to be dumped or blown into a nearby drop inlet.

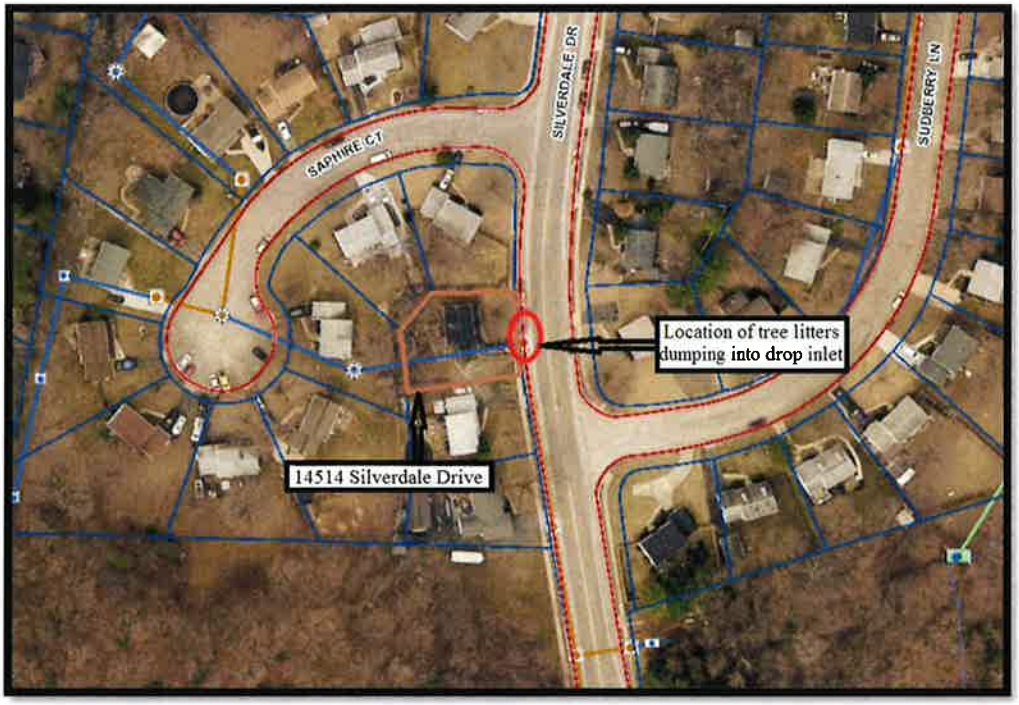


Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

Following the inspection, a meeting was made with Mr. livengood. It was made known that any litters, trash, clippings, or yard waste dumped into the storm sewer system is a violation of county ordinance as per Sec. 23.2-4. As a result NOV 1-2017 was issued to the property owner to clean, collect, and dispose of debris from the storm sewer system as soon as possible. This was to be completed no later then 30 days from receipt of the NOV.

Mr. Livengood reported the completion of corrected deficiency on same day as the NOV was issued. A follow up inspection was made on 7/22/2016 and the deficiency was found to be corrected. The case has been closed as all required mitigation on the site has been completed.

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OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

INCIDENT INFORMATION			
Incident Report #:	Date : 4/5/2017		Time : 3:30 PM
Business : Remington Mulch Company		Report Completed By : Prem Poudel	
Address: 14601 Lee Highway		City, State : Gainesville, VA	Zip Code: 20155
Case Detail: No containment of Leachate /Green colored discharge/ Strong odor			

Photo of discharge:

Onsite Water Quality Test performed: Choose an item. If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm):NA Limit:NA		Temp.: -°F Limit: NA
Discharge related Indicators	Odor: Decaying Organic	Color: NA	Turbidity: NA
	Floatables: NA	Stains: NA	Deposits: NA

Map of Trackdown Path:

Aerial Map/14601 Lee Hwy

Responsible Party (Owner/ Institutions)	Other Party (Management Company)
Name:	Name: Lenny Wright (Safety & Environmental Compliance officer)
Company: VISTAS AT LAKE MANASSAS LLC	Company: Remington Mulch Company
Address: 3684 Centerview Drive Suite 120	Address: 14601 Lee Hwy Gainesville, VA 20155
Phone #:	Phone #: 703-200-5072
Note:	Note: lenny62.rmc@gmail.com
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date:	Date:
Time:	Time:
Name:	Name:
Company/Agency:	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

PWC Watershed received a complaint regarding discharge of green colored leachate and bad odor from the property 14601 Lee Highway into an adjoining creek. The complaint was reported by citizen at 1:15 pm on 04/05/2017. The site was inspected by Watershed staff on same day. The facility was rented with Vistas at Lake Manassas LLC and running business for Remington Mulch Company (RMC). Mr. Lenny Wright, the Safety & Environmental Compliance officer of the company was available at site. The entire facility was inspected with him.

The site was observed to have several piles of timbering waste and some of which was placed in RPA buffer. Mulch was produced at several locations. The service road was developed on RPA buffers. The detention pond was found to be placed near stream crossing which was about 15 feet apart from live stream. The pond had shallow black water with odor of decaying organic materials. Pond was filled with sediments and wooden debris. Generators were running in open space to pump water from creek at the bank and gas containers were found to be spread out randomly. Leachates found to be released at the toe of each pile and sludge developed by running vehicles. Leachate , debris and sludge have high potential for being washed away into creek during rainfall.

Mr. Wright said, RMC is running under VPDES permit under the name of Vistas at Lake Manassas Limited Liability Company 14505 Lee Hwy Gainesville, VA 20155 but the information could not be verified at site due to lack permit copy onsite.

Conclusion:

After reviewing aerial map in county GIS system, the size of business was quite small until 2012 and suddenly enlarged at 2013. There is an additional land disturbance from 2012 to 2013 with the evidence of reduction of ground cover and encroachment into the RPA. From the online record of DEQ, Vistas at Lake Manassas LLC , 14505 Lee Hwy is a VPDES Permitted Company with permit # VAR051298 but it needs to be verified whether this permit covers the business running at 14601 Lee Hwy or not. The permit # VAR051298 will be requested from DEQ to verify the coverage. The owner needs to be notify to submit legal evidence for RPA encroachment and new development.

Notifications:

Citation Code Section:		
Citation Narration:		
NOV Issued: Choose an item.	NOV # :	EnerGov Case # :

Photos:






















PRINCE WILLIAM COUNTY DEPARTMENT OF PUBLIC WORKS
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OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

INCIDENT INFORMATION			
Incident Report #: 47/2017	Date : 6/5/2017		Time : 2:30 PM
Business : Residential Areas		Report Completed By : Prem Poudel	
Address: 15414 Gossoms Store Rd		City : Haymarket, VA	Zip Code: 20169
Case Detail: Mrs. Roberta Gould was experiencing a foul odor coming from the storm drains near her house 15414 Gossom Store Rd since last few days. The case was reported on 06/01/2017.			

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm): NA Limit:NA		Temp.: ---- °F Limit: NA
Discharge related Indicators	Odor: Other	Color: NA	Turbidity: NA
	Floatables: NA	Stains: NA	Deposits: NA

Map of Trackdown Path:

Responsible Party (Owner/ Institutions)	**Other Party (Management Company)**
Name: NA	Name: NA
Company:	Company:
Address:	Address:
Phone #:	Phone #:
Note: Under Investigation	Note: Under Investigation
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date:	Date:
Time:	Time:
Name:	Name:
Company/Agency:	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

PWC staff inspected the site to address the citizen complaint on 06/05/2017. Upon arrival, faint odor was experienced. Storm sewer system has tracked along points A, B and C and couldn't get access to inspect D. The grass clippings were left over the lawn after mowing. Unattended Pet waste (Poo) and fertilizers were found to be applied on lawn behind the house of complainant.

Following inspection, an interaction was made with complainant. She said, same incident had happened a year ago at the same time and someone from the County and Toll Brothers came out and addressed the issue. The Case was forwarded to E &S area Inspector to investigate the problem and requested to find out the way of solution undertaken a year ago. The source of bad odor may be an over application of chemicals and fertilizer but the complainant suspected ~~suspect~~ to have a dead animals stuck into storm sewer system.

Conclusion:

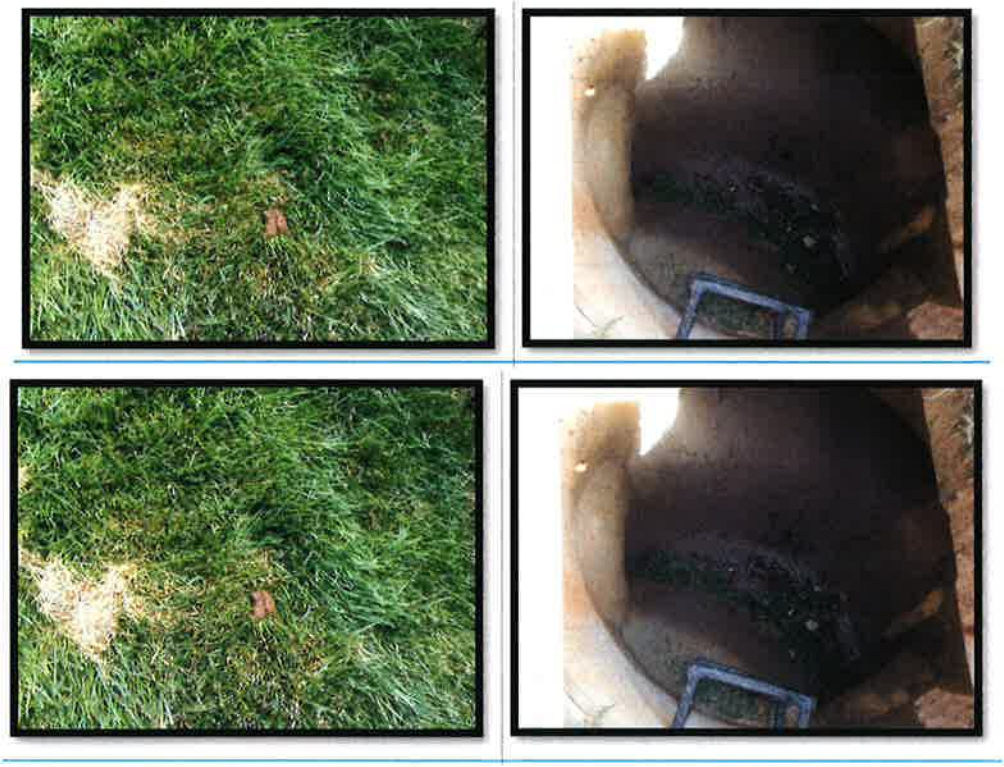
The case is ongoing for further investigations. Ultimately, camera van inspection may give the satisfactory result about possible dead animal stuck over into storm sewer system.

~~The case is ongoing for further investigations.~~

Notifications:

Citation Code Section: NA		
Citation Narration: NA		
NOV Issued: NO	NOV # :NA	EnerGov Case # : NA

Photos:



Follow up inspection made on 7/5/2017. According to complainant, bad odor is continuing through out last month. Storm sewer system was decided to inspect by CCTV (Closed Circuit Television) to identify whether dead animal stuck into storm sewer system or not. CCTV inspection was completed on 7/13/2017. After video inspection, dead animal did not observe sticking into storm sewer system. The complainant will be informed about observed conditions. Case has been closed now.

Trackdown Report

Prem Poudel
Environmental Compliance Inspector
PWC Environmental Services

ASAP Auto Recycling Salvage
14823 Dumfries Rd Manassas, VA 20112

Tuesday, July 12, 2016

On July 12, 2016 PWC Environmental services received an email from Graham Clark, a PWC DFR technician, reporting a commercial fire at ASAP Auto Recycling and Salvage Company, located at 14823 Dumfries Road. The fire occurred at 4:23 PM on 07/11/16 leading to a hazmat incident. Heavy fire had damaged vehicle batteries resulting in possible lead and sulfuric acid run off. In addition, fuel leaks from tanks, used oil containers, and fuel oil tank containers were reported. Water quality tests of firefighting discharges were conducted at multiple locations for pH. Results showed a pH of 7 to 8 for each test. Matthew K. Adkins of PWC DFR took the lead in coordinating all parties, including DEQ, PWC DFR and PWC ES. At 1:30 PM on 7/12/2016 all parties met in front of ASAP Auto Recycling and Salvage Company. Among attendees were Marc Millar; Susan Mackert; Amy Dooley from DEQ, M. Hubbel; K. Stewart from DFR and Prem Poudel from ES. The site has since been shut down by PWC Division of Building Development.

Figure 1: Map of Track down Path.

A visual inspection of the facility was made from the outside since legal access was not permitted. The property was found to be mostly used for parting and storing junk vehicles. Stains of grease, oils, and other chemicals were observed at multiple locations within the facility. Junk cars were observed leaking where stored. The main building on the property was observed to be partially damaged by fire. Mrs. Susan Mackert briefly described the past history of ASAP Auto Recycling and Salvage. Moreover, DEQ had already sent a letter to the owner of 14823 to apply for appropriate VPDES, but received no response. In describing pollution control measures at the site, Capt. Kim Stewart stated earthen berms were used to contain flow while absorbent rolls were used to absorb hydrocarbons from firefighting discharge. The pH was found within 7 to 8 on sample taken in multiple places. There is no storm sewer system within the property of 14823 Dumfries Rd. The storm water passes over to adjacent properties as a surface runoff. The property found to be surrounded three sides by another property as described in the following paragraph.

In addition to the visual inspection of 14823 Dumfries Rd, a field inspection was made for the surrounding property, 14843 Dumfries roads. The surrounding property, and associated business 234 PICK-UR-PART, is used for similar processes (parting and storage of junk vehicles). A phone contact (703-314-7710) was made with Mr. Omar Amrit, owner of 234 PICK-UR-PART. He claimed that DMR reports are periodically sent to the DEQ. During field investigation, the property 14843 Dumfries Rd was found to be connected with PWC Public School MS4 system at its eastern side. The northwest portion the property is found to be sloped towards PWC fleet services and landfill. A vegetative buffer was found to be exist at all three boarders of the property excluding the south boarder. See the following photographs for more detail on violations.

Pictures: Property 14823 Dumfries Road (ASAP Auto Recycling and Salvage)

Locked Gate

Sealed info.

Junk Yard

Fenced Property

Pictures: Boundary of Property 14843 Dumfries Road

East-1

East-2

East-3

East-4

North-1

North-2

North-3

North-4

N/W-1

N/W-2

W-1

W-2

S/Gate-1

S/Gate-2

S/Gate-3

Pictures inside the property of 234-PICK-UR-PART, 14843 Dumfries Road

Figure 3: Trackdown Photos

In conclusion, it was determined that the ASAP Auto Recycling and Salvage Company needs to apply for appropriate VPDES permits. The case will be handled by DEQ, led by Susan Mackert. It was found during field investigations that the adjacent property, 234 PICK-UR-PART located at 14843 Dumfries Rd, also doesn't hold applicable VPDES permits. 234 PICK-UR-PART was determined to need to apply for more appropriate VPDES permits, better pertaining to operations occurring at that facility.

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OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

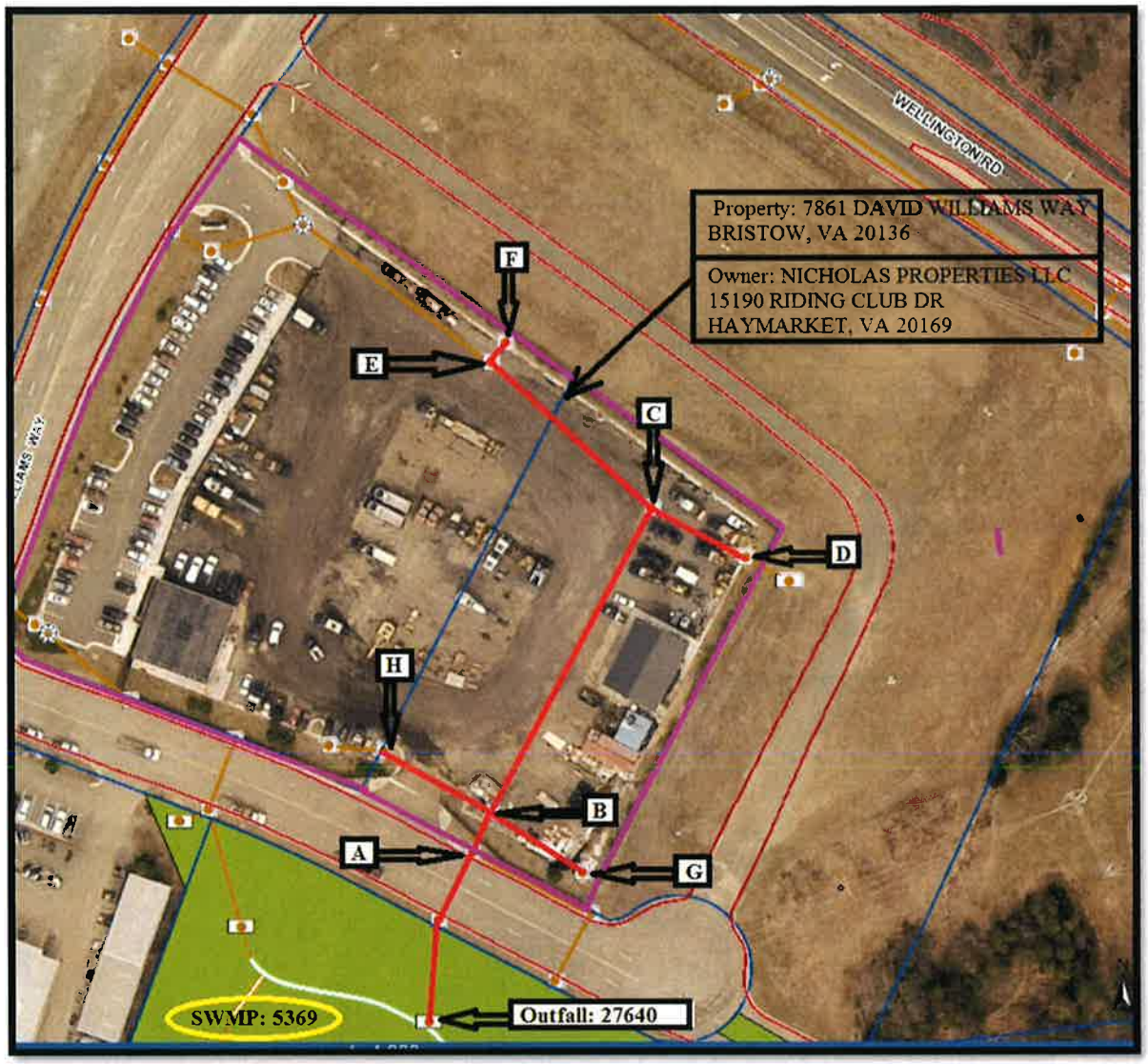
INCIDENT INFORMATION			
Incident Report #:	Date : 3/22/2017		Time : 11:00 am
Outfall: 27640	Business : FINLEY [Milling, Paving, Stealing, Site Concrete]		Report Completed By : Prem Poudel
Address: 7861 David Williams Way, P.O. Box 1710	City : Manassas		Zip Code: 20108
Complain or Case Received From: T. Dombrowski	Date: 3/21/2017		County Employee:Yes
Reported Case: Creek has significant turbid flow with suds and petroleum waste passing through road culverts at Rolling Ford Rd nearby Willington Rd.			

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

pH : Limit: NA	Conductivity (µS/cm) Limit: NA		Temp.: °F Limit: NA
Discharge related Indicators	Odor: Petroleum/Gas	Color: Black	Turbidity: NA
	Floatables: NA	Stains: Oily	Deposits: Debris

Map of Trackdown Path:



Responsible Party (Owner/ Institutions)	Other Party (Management Company)
Name: NA	Name: Mr. Ron Lane (Vice President)
Company: NICHOLAS PROPERTIES LLC	Company: FINLEY
Address: 15190 Riding Club Drive, Haymarket, VA 20169	Address: 7681 David Williams Way
Phone #:	Phone #: 703-368-2289
Note:	Note: Meeting made onsite
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date:	Date:
Time:	Time:
Name:	Name:
Company/Agency:	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

PWC IDDE staff received a complaint regarding turbid flow having suds and petroleum float on creek passing through road culverts at Rolling Ford Rd nearby Willington Rd. To identify the potential source of illicit discharge, the outfall inspection was started at upstream catchment.

During inspection, debris was observed to be deposited on outfall (#27640) in storm water management pond 5369. The petroleum odor was easily noticed from debris. The storm sewer system was tracked to identify the source. At point A, debris observed to be transported and deposited from AB branch. All storm sewer points from points B to G are located on the property 7681 David Williams Way, running business of Finley Asphalt and Sealing Company. Manhole B was invisible due to stacking construction materials. As per Mr. Rick Norman, the Finley Safety Officer, he has never noticed manhole at point B. Petroleum stains were observed in several points inside the facility. Asphalt tar sprayer truck and other construction equipment were parked on the graveled ground inside the property. Manhole E was also unseen and buried into the ground. Several stains of grease and oil-spilled spots were observed on the pavement and had potential to be washed away into storm sewer system during rainfall.

Conclusion:

The petroleum waste and debris were found to be transported with runoff discharge during rainfall through the storm sewer system from Finley Asphalt and Sealing Company. Following inspection, a meeting was held with Mr. Ron Lane, the Vice President of Finley Company. Education materials were handover to Mr. Lane and he was willing to control pollutants onsite by using appropriate mitigation activities. Mr. Lane has requested a punch list for corrective actions.

This is the first time an incident has been found at this facility. The incident happened unintentionally and the company is willing to address the deficiency. A notice of violation (NOV) was not issued. The following activities are recommended to be completed within 30 days after receiving the letter from the county.

Action Plan:

1) Install perimeter control around storm water inlets with grease and oil absorbent booms.
2) Minimize spills on open ground and keep unavoidable spills far from storm sewer inlet so that it can be captured before reaching the storm sewer system. Maintain graveled surface after each spill or leakage.
3) Remove construction materials stacked over storm sewer system and keep manhole B and E open (See on track down map).
4) Keep oil, grease and chemicals in closed container.

Notifications:

Citation Code Section:		
Citation Narration: Grease and oil spots are the source of petroleum odor at outfall.		
NOV Issued: NA	NOV # :	EnerGov Case # :

Photos:

Oil and grease spill on the ground

Materials- stacked over structure

Unprotected drop inlet

Tar stain under sprayer truck

Debris at Manhole A

Debris at Manhole D

Trackdown Report

Prem Poudel

5710 and 5708 Sailstone ln,
Woodbridge VA 22193

Tuesday, August 23, 2016

Figure 1: Photo of Discharge.

At 9:59 am on August 22, 2016 Environmental Services received an email from Lee Chraska, , regarding a dumping grass clippings on the street by the home owners of 5710 and 5708 Sailstone Lane. The site was inspected on 23rd August, 2016. Upon arrival, grass clippings were observed on the pavement in-between properties 5710, 5708, 5709, and 5559. Each household member was met to talk about the issue and hand over educational materials. The street adjacent to 5709 was immediately cleaned up by the responsible home owner. According to the home owner of 5709, they don't have HOA for management.

Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

Members of property 5710 and 5708 agreed that they were responsible for dumping clippings after mowing their lawns and promised to clean it up within few days. NOV was not issued since both responsible parties were found highly responsive to cleaning the street and typically the County makes education the first priority with homeowners on these types of cases.. A follow up inspection will be made on the following week to inspect for corrective actions. If the issues still exists, successive investigations will be made for enforcement in future.

Follow-up Inspection:

Follow-up inspection was made on 08/29/2016. The problem of discharging clippings on street was satisfactorily cleaned by the community members.

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OFFICE: 703-792-7070 FAX: 703-792-6297

INCIDENT/TRACKDOWN FORM

INCIDENT INFORMATION			
Incident Report #: 29/3_27_17	Date : 3/10/2017		Time : 11:15 AM
Business : NA		Report Completed By : Prem Poudel	
Address: Creek near intersection of Robling Ct &Sheraton Dr		City : Manassas	Zip Code: 20112
Complain or Case Received From: Kathy Hildebrand		County Staff: yes	

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

pH : NA Limit: NA	Conductivity (µS/cm): Limit:NA		Temp.: °F Limit: NA
Discharge related Indicators	Odor: NA	Color: NA	Turbidity: NA
	Floatables: NA	Stains: NA	Other: NA

Map of Trackdown Path:

Responsible Party (Owner/ Institutions)	Other Party (Management Company)
Name: NA	Name: NA
Company: VALLEY VUE ASSN OF HOMEOWNERS INC	Company: NA
Address: 13482 Natick Dr. Manassas, VA 20112	Address:
Phone #:	Phone #:
Note:	Note:
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?) – Not necessary	
Date:	Date:
Time:	Time:
Name:	Name:
Company/Agency:	Company/Agency:
Notes:	Notes:

Comments/ Deficiencies:

PWC IDDE staff received a complaint regarding significant amount of white foam on creek passing through Sheraton Drive before the intersection of Sheraton Rd and Robling Ct while driving S-W direction. Site was visited by IDDE staff on 03/27/2017.The facility was a road culvert for a creek through scattered residential areas. The reported white foam did not observe at creek. Upstream creek was inspected to investigate the potential runoff but remarkable source for suds could not observe. It may be washed away due to rainfall, happened before inspection.

Conclusion:

Follow up inspection will be continued for further investigation.

Notifications:

Citation Code Section: NA		
Citation Narration: NA		
NOV Issued: No	NOV # : NA	EnerGov Case # : NA

Photos:

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INCIDENT/TRACKDOWN FORM

INCIDENT INFORMATION			
Incident Report #: 30/3-28-17	Date : 3/28/2017		Time : 2:00 PM
Business : Residential		Report Completed By : Prem Poudel	
Address: SW- Inlet (35033) nearby 2937 Stockholm Way		City : Woodbridge	Zip Code: 22191
Case Detail: Cooking oil bottles (glass) being dumped into storm water inlet across street 2926 Stockholm Way			

Photo of discharge:

Onsite Water Quality Test performed: NA If yes, observed results:

PH: NA Limit NA	Conductivity (µS/cm): NA Limit: NA		Temp.: -°F Limit: NA	
Discharge related Indicators	Odor: NA	Color: NA	Turbidity: NA	
	Floatables: NA	Stains: Oily	Deposits: Litters	

Map of Trackdown Path:

Responsible Party (Owner/ Institutions)	Other Party (Management Company)
Name: Not identified	Name: Mrs. Bethany Lamar (Manager)
Company:	Company: Community Management Corporation
Address:	Address: 4840 Westfields Blvd Suite 300, Chantilly, VA 20151
Phone #:	Phone #: 7030-230-8580, 703-631-7200
Note:	Note:
Notification/Contact (Other agencies contacted (DEQ, NS, FMO?)	
Date: 3/29/2017	Date:
Time: 11:34 AM	Time:
Name: Neighborhood Services	Name:
Company/Agency: PWC Neighborhood Services	Company/Agency:
Notes: Case forwarded to NS to inspect from their side.	Notes:

Comments/ Deficiencies:

On March 27, PWC IDDE staff received a complaint regarding cooking oil bottles (glass) being dumped into storm water inlet across street 2926 Stockholm Way. Site was inspected on 3/28/2027. Upon arrival, cooking oil bottles observed dumping into storm inlet, located near 2937 Stockholm Way. Black stains were covered with fresh oil. Piece of bottles were seemed to be spread out and few bottle neck were observed with cap after breaking on flat surface of inlet structure. It is an evidence of dumping waste cooking oil after filling and capping. Visual condition proved that the incident was not a single and had happened repeatedly. Conversation made with three different residents, but nobody gave the clues to identify the violator.

After tracking storm sewer system, the impact of dumping was found to be localized between two curbs and gutters inlets. Grease and oil debris didn't observe at successive downward manhole B and even didn't observe significant impact on downstream outfalls.

According to one of the residents, most of the residents keep their trash out in various boxes and bags instead of designated (Recycle and Non-recycled) trashcans. Trash use to be spread out and blown into storm sewer system during windy days. Trash collecting agency also does not have a specific time even though pickup performs two times a week. A good trash collection and haulage practice is a way to stop spreading and blowing trash into storm sewer system especially in a windy season. The case has also forwarded to PWC, Neighborhood services to watch from their side.

Conclusion:

Dumping oil into storm sewer system is a violation of law. The property management company is responsible make residents aware about those unlawful activates. The case needs to inform to the property management company to investigate and take an action on this issue. The case may be happen due to ignorance about unlawful activities among residents. Since the case has received first time, the case has forwarded to property management company to mitigate the deficiencies. Failure to comply deficiency within 30 days after receiving letter from County, NOV will be issued to the Property Management Company. Follow up inspection will be continued to monitor the mitigation activities.

Following activities need to address in action plan.

1. Immediately stop dumping oil into storm sewer system.
2. Clean the stain, debris and trash from storm water inlets.
3. Maintain good trash collection and haulage practices.

Notifications:

Citation Code Section: 23.2-4.1		
Citation Narration: Unlawful discharge to the storm water system and waters of the county.		
NOV Issued: NO	NOV # : NA	EnerGov Case # : NA

Photos:

Discharge Report

Prem Poudel

Tacketts Mill Car Wash
12831 Harbor Drive
Lake Ridge, VA 22192

Thursday, July 28, 2016

Figure 1: Photo of Discharge.

On July 28, 2016 PWC Environmental Services received a call from Arika Davidson of Prince William County Neighborhood Services concerning an illicit discharge. Fluid from a leaky dumpster was found to be flowing towards the storm sewer system at Tacketts Mill Car Wash, located at 12831 Harbor Drive. A field inspection was made on same day. Upon arrival, black sludge pulled from the car wash area during a cleanout operation was found to be discarded into the dumpster located beside south entrance of the property. Fluid was leaking out of the dumpster and observed flowing towards storm sewer inlet.

Following the inspection, a meeting was made with Mr. Javed Butt, the manager Tacketts Mill Car Wash. According to him, the sludge, approximately 6/7 buckets worth, was removed from a drainage tunnel within the car wash property and dumped into the dumpster. The fluid extracted from sludge was starting to flow through dumpster. Cotton towels were immediately used to absorb leachate flowing on the pavement to cease the flow directed towards storm drain.

Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

As per county ordinance sec. 23.2-4.1 any non-stormwater discharge to the stormsewer system is considered a violation. As a result NOV 3-2017 was issued to Tacketts Mill Car Wash. The corrective action plan should include:

1) Capture the leaking fluid as soon as possible.
2) Clean the stain from pavement without allowing washed fluid flow into storm sewer system.
3) Maintain the integrity of dumpster to prevent future leakage

Follow-up inspection:

Follow up inspections were made on 8/1/2016 and 8/8/2016 respectively. Discharge was stopped but cleaning activities were not completed during 1st follow-up inspection. The leaky dumpster was replaced and stains were cleaned from underneath pavement and asphalt following the 2nd follow up inspection. The Case is now closed.

Trackdown Report

Prem Poudel

Violator Unidentified
1282 Corbelt Pl
Woodbridge, VA 22191

Tuesday, July 19, 2016

Figure 1: Photo of Discharge.

On November 7th 2016, the site inspector of PWC Environment Services Mrs. Sandra Adams reported a chlorinated illicit discharge into storm sewer system through SWM pond (454) outlets located at 1282 Corbelt Pl with attached picture shown in figure 1. The site was visited on same day. Upon arrival, faint odor of chlorine was felt at pond outlet and suds were not on scene. Water quality was tested with YSI professional for pH, DO, Conductivity and temperatures. Tested all results were within standard limits. Desktop analysis was made on collected sample and chlorine was found 0.015 mg/l which is slightly higher than the standard limit (0.01 mg/l). Pond inlets were inspected to identify the potential source of contamination. Among four, downstream three outfalls 30030, 30028 and 30024 were dry and only upstream stream sewer was flowing. The upstream stream sewer should be connected with storm sewer laid within shopping center but it doesn't show up in the county mapper. The potential source of illicit discharge couldn't identify in first visit. Follow up inspection was made to identify potential source of chlorinated discharge on 11/10/2016. There is a swimming pool made for Woodbridge Forest Apartments, located at 13250 Gordon Blvd. The concrete swale with riprap at its end was observed directed into pond. The facility was inspected but there was no foot print of discharge on the ground and swale.

Figure 2: Map of Trackdown Path

Figure 3: Trackdown Photos

The potential source could be the chlorinated pool water discharged into storm sewer system but there were no sufficient evidences to prove it. Following the inspection, meeting made with property management team and talked about the issues. The educational materials were handover to the property management team for making them aware about an illicit discharge. NOV didn't issue since the violator couldn't identify. Follow up inspection will be continued periodically for inclusive investigations.

Trackdown Report

Prem Poudel

Washington Gas Maintenance Work
9813 Lomond Dr.
Manassas, VA 20109

Tuesday, November 01, 2016

Figure 1: Photo of Discharge.

On October 31, 2016 PWC Environmental Services received a complaint regarding the mud that the contractor for Washington Gas put into the street and was washing down the storm sewer system. The facility in question was the street in front of 9813 Lomond DR. The site was visited by PWC Environmental Services staff on Nov 1, 2016. Upon arrival, mud sludge was cleaned from road curbs and gutters and only minor dust and stains were left over.

The major deficiencies were found to be corrected after complaining by the residents. So notice of violation didn't issue and the case is closed.

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector

17247 Wayside Drive
Dumfries, VA 22026

Contact of owner:
NAI Eagle Commercial Real Estate Services
9954 Maryland Dr.
Richmond VA, 23233

Thursday, July 28, 2016

During a routine inspection, the dumpster located at 17247 Wayside Drive was observed leaking and discharging grease and waste food fluid into storm sewer drop inlet. Fats, oils, and greases were observed spilling on the pavement around a grease collection tank. The stain of fats, oils, and greases was also directed towards storm drain. This incident was a re-occurrence from NOV 2015-08 issued on 10/08/2015.

Figure 1: Site map showing discharge flow path through the storm sewer system.

Fats, oils, and grease were observed flowing towards the storm sewer system. The debris and residue were observed having washed away into storm sewer system during rain events. The meetings were

made with both manager of Five Guys and Mandarin Court particularly located enclosure to the dumpster. Both of them didn't accept the mishandling of waste while using those facilities. The bottom of the dumpster was observed to be broken.



Discharging waste food fluids, fats, oils and grease is a violation of county ordinance as per sec. 23.2-4.; NOV will be issued to the property owner or Management Company to correct the deficiencies.

Follow-up inspection:

A Follow-up inspection was made on 8/8/2016. The integrity of dumpsters and grease container was corrected by replacing old damaged equipment. The grease and waste food fluid stains were cleaned. The case has now been closed. See attached pictures.


Appendix F – Spill Prevention and Response

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170006532	Date: 3/1/2017
Location:Hoadly Rd/Hoadly Run Ct	Time: 11:31
Report Completed By: Lt. N. Baskerville	Incident Commander: AC McClintock
HM 506 Personnel Responding: Baskerville, Luke, McLauren HS 516 Personnel Responding: Other HMT Personnel Responding: HM502	

INCIDENT DESCRIPTION	
Hazmat 506 arrived on the scene of a tree trimming vehicle over turned on an embankment. Command stated that the vehicle was leaking desiel fuel and hydrolic fluid. The estimate of desiel fuel was a 60 gallon tank flowing rapidly. The hydrolic fuel was estiamted at 20 gallons already on the ground. Hazmat 506 waited for the patient to be extricated, vehicle to be stablized, and vehicle to be uprighted before examining the leak at the vehicle. The desiel fuel leaked, pooled, and saturated the ground (dirt) beneath the vehicle. The leak did not spread any further than the accident. While waiting for the vehicle to be uprighted, a significant rain fall occurred. After the vehicle was uprighted, no further leaking occurred. Monitoring was done with a 4 gas meter throughout the event; no levels exceeded 10% at any time. There was 0% LEL at the time of leaving. Provided the responisble party with an LEPC form for clean up. Redman Towing insured they had been in contact with Atlas cleanup company to dig up some of the dirt that had been contaminated.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Kenneth Kiblery	Name: John Redman
Company: Lewis Tree Company	Company: Redman Towing
Address:	Address:
Phone#: 585-435-7551	Phone#: 703-928-5899
Notes:	Notes: Towing Company

NOTIFICATIONS/CONTACTS	
Date: 3/1/2017	Date:
Time: 1715	Time:
Name: Blake	Name:
Comp/Agency: VEOC	Comp/Agency:
Notes: Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


LEWIS TREE CO.
F150
THIS VEHICLE IS EQUIPPED WITH SPEED MONITORING
I'M DRIVING THE SPEED LIMIT FOR YOUR SAFETY AND MINE
TX 231-929


REDMAN
FLEET SERVICES, INC.
Lorton, Va.
VCC-CC-774
USDOT-516228

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160020532	Date: 7/8/2016
Location:5694 Roundtree Dr/Rowser Dr	Time: 18:24
Report Completed By: Graham Clark	Incident Commander: Captain Wyks
HM 506 Personnel Responding: None HS 516 Personnel Responding: None Other HMT Personnel Responding: None	

INCIDENT DESCRIPTION
18:24 E517 dispatched to a hazard at the intersection of 5694 Roundtree Dr and Rowser Dr for a paving truck leaking tar onto road with impingment on sewer. Upon arrival the paving truck was gone, but a citizen using water from garden hose was washing down the area. The run off did make it into a near by sewer. E517 stopped the citizen, and applied absorbent to remaining product. 18:38 Captain Wyks requested a phone consult with DHM. Tech II Graham Clark handled the consult. Captain Wyks could not give an estimate to the amount of product, but said "it didn't seem like much." When asked about the products physical properties and distance to nearest waterway, Captain Wyks stated that the nearest waterway was over a 1/4 mile away, and the consistency of product appeared to be drying up. It was determined that PWC Hazmat did not need to respond by Tech II Clark, and no LEPC was given due to responsible party not being on scene. 18:51 Phone call to Matt Adkins advising situation. 19:06 VA EOC notified 19:30 Courtesy email to Marc Aveni at PWC Public Works Watershed Management

RESPONSIBLE PARTY	OTHER PARTY
Name: N/A	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/8/16 Time: 19:06 Name: Chris Comp/Agency: VAEOC Notes: Courtesy notification phone call	Date: 7/8/16 Time: 19:30 Name: Marc Aveni Comp/Agency: PWC Public Works Watershed Management Notes: Courtesy email
Date: Time: Name: Comp/Agency: Notes:	Date: Time: Name: Comp/Agency: Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160020846	Date: 7/11/2016
Location:14823 Dumfries Road	Time: 16:23
Report Completed By: Graham Clark	Incident Commander: BC Jeff Crawford
HM 506 Personnel Responding: Graham Clark HS 516 Personnel Responding: Jay Byler, Stephen Ching, Jonathan Carter Other HMT Personnel Responding: Kim Stewart, Matt Adkins (E507 Crew - Operations level support)	

INCIDENT DESCRIPTION
16:23 Commerical fire dispatch for working fire at ASAP Auto Recycling and Salvage. Hazmat units called to the scene for multiple hazmat issues as a result of the fire. HMO 502 had HS516 and E507 crews conduct defensive control measures for the run off of water from the fire incident. A total of 8 booms were deployed, along with multiple dams made from soil. HM506 crew conducted air monitoring with the 4-gas and PID meter, and sampling with pH paper. E507 crew assisted with control measures. Multiple samples were taken, pH levels were between 7-8 at all locations tested. A visible sheen in the water was noted at multiple locations of runoff. HMO502 and G. Clark investigated the fire building and it's contents once the fire was extinguished; a pile of vehicle batteries had sustained heavy fire damage with possible lead and sulfric acid runoff, a pile of used fuel tanks had sustained heavy fire damage (unknown amount of fuel), multiple containers of used vehicle oil sustained heat damage (unknown of container integrity), and fuel oil tank on side charlie sustained thermal damage (reported minimum amount of oil in tank, unknown of container integrity). PWC Fire Marshals on scene investigating, and coordinating clean up with responsible party, a clean up company was not identified prior to hazmat unit departure. VAEOC notified at 21:00 hours, and Marc Aveni with PWC Public Works Watershed Management nofitied at 22:45. Unknown distance and severity of water runoff. Pictures attached below.

RESPONSIBLE PARTY	OTHER PARTY
Name: Scott Kelly	Name:
Company: ASAP Auto Recycling and Salvage	Company:
Address: 14823 Dumfries Road, Manassas, VA 20112	Address:
Phone#: 703-794-8026 (Business) 540-295-2527 (Cell)	Phone#:
Notes: Owner since 2006	Notes:

NOTIFICATIONS/CONTACTS	
Date: 07/11/16	Date: 07/11/16
Time: 21:00	Time: 22:45
Name: Chris	Name: Marc Aveni
Comp/Agency: VAEOC	Comp/Agency: PWC Public Works Watershed Management
Notes: Phone notification	Notes: Courtesy email notification

NOTIFICATIONS/CONTACTS	
Date: 7/11/2016	Date: 7/12/2016
Time: 20:45	Time: 0700
Name: Mark Miller	Name: Polly Flory
Comp/Agency: DEQ	Comp/Agency: PWC Landfill
Notes: Adkins left Voice Mail - Mr. Miller emailed back that DEQ will be investigating on 7/11	Notes: No impact to adjacent county property noted by landfill management.
Date: 7/12/2016	Date: 7/12/2016
Time: 1200	Time: 1300
Name: Prem Poudel	Name: Jim Honeycut
Comp/Agency: Prince William Environmental Svcs	Comp/Agency: PWC Schools Risk Management
Notes: Mr. Poudel, called to state he would visit the site.	Notes: Contacted in regards to impact on school property.
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: .

HAZMAT Officer Comments: Utilized E507 Crew for additional manpower during incident. All personnel conducting fire attack were directed to wash PPE after returning to station. All personnel we flushed with water after exiting fireground. The property is an autosalvage yard that is surrounded by junked cars on all sides. There were indications of multiple spills and releases to the ground, most likely any sheen not directly connected to the structure where the fire occurred was caused by runoff picking up contaminents that were already on the ground. PWC Fire Marshal's Office has filed notice of violation or charges for fire code violations. (HMO501 Adkins).

7/12/16
At 13:20 HMO502 Stewart inspected adjacent property for runoff at 14855 Dumfries Rd. Property is owned by PWC School Board. Observed wet soil area at the low point between addresses with clear path of water flow to a storm water drain on school board property. Also observed water at the storm water management retention pond. See attached photos.
At 1347 reported findings to HMO501 and requested that the School Board be notified.
At 1340 HMO502 met with Mark Miller of DEQ and two others from that agency as well as a Prem Poudel from PWC Dept. of Public Works, Environmental Services at the fire address. Access was blocked by fence.
At 14:15 HMO502 met with Andres Uglow, PWC School Board environmental Project Manager and relayed findings related to school board property from earlier in the day.

** Picture with map - Red Stars indicate location of booms or other spill control methods taken at the site.


HYDRION


14811 DUMFRIES RD
14809 DUMFRIES RD
14821 DUMFRIES RD
14843 DUMFRIES RD
14823 DUMFRIES RD
14855 DUMFRIES RD
14869 DUMFRIES RD
14851 DUMFRIES RD
160 Feet
Copyright © 2016 Prince William County
Aerial Imagery © 2015 Pictometry, Inc.
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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160021755	Date: 7/19/2016
Location:5 County Complex Court	Time: 14:30
Report Completed By: Adkins	Incident Commander: Jarman/Adkins
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding: HMO501 Adkins, FMO Knight	

INCIDENT DESCRIPTION
Was contacted by FMO501 Jarman in regards to a spill by a Bates Trucking Garbage truck at the County Development Services Building. The truck developed a leak on the hydraulic system, spraying hydraulic oil on the garbage dumpsters, and on the generator behind the dumpsters. An estimated 10 to 15 gallons was spilled. The Driver of the Garbage truck did not report the release and left the scene without any notification. A county custodial staff member emptying garbage discovered the spill. Upon making contact with Bates, the truck returned and they sent a service crew to fix the truck and planned to pressure wash the oil into storm drains. FMO Jarman indicated to Bates cleanup must be affected by a contractor who can account for the hazardous material. Bates informed FMO Jarman that "cleanup was not their responsibility." FMO Jarman informed them otherwise and shortly aftewards stated that Miller Environmental was being contracted. County Staff placed additional oil dry on the spill and Bates Staff did broom the spill for a few minutes. Miller Environmental contated HMO Adkins to state they had provided documentation to Bates for approval to proceed and required financial surety before responding. Bates never provided that information to Miller. In the morning of 7/20/2016 PWC Public Works Building and Grounds contracted with Atlas Environmental to conduct the cleanup. FMO issued NOV to the driver for illicit discharge.

RESPONSIBLE PARTY	OTHER PARTY
Name: Ylrico Alexander	Name:
Company: Bates Trucking	Company:
Address: 4305 48th Street - Bladenburg, MD 20710	Address:
Phone#: 3017732069	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/19/2016	Date: 7/19/2016
Time: 1900	Time:
Name:	Name: Bobby Jocz
Comp/Agency: VAEOC	Comp/Agency: PWC Watershed Management
Notes:	Notes: On Scene
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Additional Notes/Information:
HAZMAT Officer Comments: Provided Copy of Report to VA-DEQ for reference.


DIESEL FUEL


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BG3019

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160021795	Date: 7/20/2016
Location:7700 Progress Court	Time: 08:02
Report Completed By: Schwab	Incident Commander: FM521
HM 506 Personnel Responding: Schwab, Sweet, Abel, Bud HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
FM521 requested a phone consult while they were doing their investigation for a commercial fire. They noticed a small of gasoline and that several vehicles had been leaking gasoline on to the ground. At the time they had estimated around 6 vehicles had been leaking gas due to someone drilling through the gas tanks on the vehicles. One vehicle was located inside the business, they were advised to move the vehicle outside and away from any drains in the building. After talking with Hazmat officer 501, HM506 added themselves to the call to assess the situation. Upon arrival there was a faint smell of gasoline on the property. HM506's crew met up with the fire marshals doing the investigation and they showed us the cars that had leaking fuel tanks. The police department was also on scene conducting a criminal investigation and certain areas were off limits. There did not appear to be active leaks from any of the cars on the lot, but there were spots in the parking lot where gasoline had dried on the asphalt. There was only one drain on the outside of the property and it didn't appear that any fuel had entered into it. HM506's crew placed absorbent down as a precaution in case any of the gasoline started to leak during the investigation. HM506 took a look at where the vehicle was parked inside the business, some gas leaked out but did not reach the drain. HM506's officer advised the FM that there was no hazard present and because of the police investigation we couldn't plug any of the leaks in the vehicles. The manager of the business was given an LEPC and advised to contact one of the contractors.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Caliber Colision	Company:
Address: 7700 Progress Court Gainesville, VA 20155	Address:
Phone#: 703-753-8200	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/20/2016	Date:
Time: 10:13	Time:
Name: Macmanas	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Additional Notes/Information:
HAZMAT Officer Comments:




PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160021817	Date: 7/20/2016
Location:Jeff Davis Hwy./Vantage Dr	Time: 10:20
Report Completed By: Lt. Schwab	Incident Commander: Safety 504
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Safety 504 came upon a box truck broken down on the side of the road. He noticed a good amount of oil, approximately 5 gallons that had leaked out of the vehicle. The driver stated the driveshaft broke and cracked the oil pan on the truck. The driver had already placed absorbent on the oil and it was contained to the street, no drains or waterways were effected. The driver had already notified VDOT and Waggy's towing company was on scene to help with the cleanup. Safety 504 gave the driver and LPEC form so they could notify a cleanup contractor.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Vantage Moving	Company:
Address:	Address:
Phone#: 703-392-6260	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/20/2016	Date:
Time: 10:32	Time:
Name: Macmanas	Name:
Comp/Agency: VAOEC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
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NOTIFICATIONS/CONTACTS	
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Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160023128	Date: 8/1/2016
Location:14103 Telegraph Road	Time: 10:57
Report Completed By: TII M. Schultz	Incident Commander: N/A
HM 506 Personnel Responding: N/A HS 516 Personnel Responding: N/A Other HMT Personnel Responding: N/A	

INCIDENT DESCRIPTION	
Station 506 personnel conducted a phone consult for a 55-gallon drum near 14103 Telegraph Road. E520B was dispatched for an investigation. A caller from Public Works stated that they found a 55-gallon drum "half-full" of an unknown liquid in or near the drainage system. E520B reported that the drum had been uprighted, that there were no leaks, all readings were normal on the engine's 4-gas monitor. E520B scanned the drum with the thermal imaging camera, and determined that the drum was approximately a third full. E520B believed that there was no hazard, but wanted to consult with the on-duty HAZMAT tech. E520B's officer was advised to provide Public Works with a copy of the LEPC, which was sent to E520's officer from Station 506 personnel via e-mail.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Unknown	Name:
Company: Unknown	Company:
Address: Unknown	Address:
Phone#: Unknown	Phone#:
Notes: E520B officer has contact information for Public Works	Notes:

NOTIFICATIONS/CONTACTS	
Date: 8/1/2016	Date:
Time: 17:00	Time:
Name: Archer	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date: 8/1/2016	Date:
Time: 11:15	Time:
Name: Matt Adkins	Name:
Comp/Agency: PWC DFR	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
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Comp/Agency:	Comp/Agency:
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Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160023868	Date: 8/8/2016
Location:15329 Postillion Dr.	Time: 12:30
Report Completed By: Lt. Anthony	Incident Commander: NA
HM 506 Personnel Responding: NA HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION
Engine 512 was dispatched to a hazard. They found a Triple A trash truck had leaked hydrolic fluid on the ground. E512's officer reported that the leak had stopped and was contained prior to arrival. The driver of the truck contained the spill, approxamately 10-15 gallons, using absorbent and booms. The spill did not enter any waterway. The driver had already initiated contact with his company manager for repairs and cleanup. E512 was advised to give the driver an LEPC form and explain that his company is responsible for the cleanup of the spill. VAEOC notified of situation.

RESPONSIBLE PARTY	OTHER PARTY
Name: Mrsael Sosa Tejada	Name:
Company: Triple A Trash.	Company:
Address: 4619 West Ox Rd, Fairfax, Va	Address:
Phone#: 703-856-9867	Phone#:
Notes: Managers areRichard Shriver and Kendall Slay	Notes:

NOTIFICATIONS/CONTACTS	
Date: 08/08/16	Date:
Time: 1349	Time:
Name: MARTHA	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160025673	Date: 8/23/2016
Location:15116 Arum Pl	Time: 15:31
Report Completed By: Doug McCabe	Incident Commander: Kim Pumphrey
HM 506 Personnel Responding: Mccabe, Favole, Waln, Sawyer HS 516 Personnel Responding: Newell, Santigo, Mirabile Other HMT Personnel Responding: Kim Stewart	

INCIDENT DESCRIPTION
FM Smiljanich was on a possible bottle bomb incident and asked for a Hazmat response. Hm506 responded and reported to command. On arrival we talked to the caller, the FM's, and Command on what had transpired prior to our arrival. A plastic bottle was picked up by a resident and it "exploded" in her hand. No injuries to the citizen. She washed her hands and clothes. This happeed on Sunday. She called the FMO today to say she found more of the bottles in a trash can. PWPD on scene and had the area roped off. No FD entry made. The person who made the bombs (up to 20) was found and questioned by PWPD. The bombs were vinager and baking soda bottle bombs. Several modes of operation were made and it was decided that the State Bomb team member was going to enter the hot zone and neutralize the bombs. After the bombs were declared safe, Hazmat went in and made sure the area around the neutralized bombs were not a hazard. PH paper was used and a strong corrosive was found on several of the bottles with no recoverable product. We ph'ed the vinager bottle and cam back as a weak acid. Normal reading on QRae 4 gas and PID had no readings. The scene was declared safe and HM506 went in service.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 8/23/16	Date:
Time: 21:51	Time:
Name: Chris	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


Nutrition Facts
Coca-Cola
20 FL OZ (1.25 PT)


HEINZ
All Natural
DISTILLED WHITE
VINEGAR
5% ACIDITY
1.32 GAL (5 L)
#1
NATIONAL
BRAND

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160026513	Date: 8/31/2016
Location:Wellington Rd/ Balls Ford Rd	Time: 09:00
Report Completed By: Lt. Anthony	Incident Commander: NA
HM 506 Personnel Responding: NA HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION
E525 was dispatched to a Hazard at above address. E525 found a water tender truck on the side of the road with no driver. The saddle tank on the drivers side had a two inch tear on the side. The tear had rags stuffed into it to stop the flow of fuel. Absorbent was on the ground and a 5 gallon bucket with fuel was next to the truck. Saddle tank has approximately a 40g. capacity and half full. E525 called United Rental and found out that the truck hit the gaurdrail the day before. While on the phone with E525, PD and a representative from Fishel Co. showed up. Fischel rented the truck. They advised that their company was sending representatives to repair the truck and clean up the scene.

RESPONSIBLE PARTY	OTHER PARTY
Name: Chris Nicols	Name: Mark
Company: Fishel Company	Company: United Rental
Address:	Address:
Phone#: 520-514-6709, M-480-440-7787	Phone#: 703-327-2800
Notes: They rented the truck	Notes: They own the truck.

NOTIFICATIONS/CONTACTS	
Date: 08/31/2016	Date:
Time: 10:45	Time:
Name: Mr Gaulding	Name:
Comp/Agency: VEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160027360	Date: 9/8/2016
Location:10910 George Mason Circle	Time: 21:46
Report Completed By: Tech II Snitwongse	Incident Commander: BC501 Lott
HM 506 Personnel Responding: Technician II Snitwongse, Lt. Miller, Tech I Malone, Tech I Santiago, Tech I Waln,Tech I Sawyer HS 516 Personnel Responding: Captain Newell, Tech II Mirabile, Tech I Gonzales Other HMT Personnel Responding: HM502, HM501	

INCIDENT DESCRIPTION

HM506 and E506 responded to 10910 George Mason Circle for a report of Smoke emitting from a chemistry/science lab experiment in a BSL2 lab. Upon arrival on scene command briefed Company 6 units that an employee of the university cleaning staff noticed the smoke in the science lab and informed the night security guard of the issue. The security guard as well as the cleaning staff were exposed to the unknown substance. The exposed parties were quaranteened and interviewed for additional information and given decon and medical treatment. The cleaning staff took pictures on her cell phone camera before she exited the building that were crucial to our investigation. Another employee who was not exposed was instumental in providing technical knowledge of the machines and equipment affected. He was utilized as our site expert as he had knowledge of the lab equipment. With his help it was determined that the product was not a Biological Hazard or compressed flammable gas.

Upon arrival of HMO502 and HMO501, E516 and HMS516 we were able to plan our mitigation approach with the site expert. With his help it was determined that the product was most likely chloroform. With the new information provided the decision to recon and take action wearing structural PPE and SCBA to investigate the source of the smoke was determined. Emergency decon was set up by non Hazmat crew of E506 and E516. Emergency decon procedures were adequate until further investigation was done.

Lt. Miller and Tech II Snitwongse fulfilled the role of entry team one and Captain Newell and Tech I Gonzalez were utilized as entry team two. For the purpose of communication entry team one maintained constant two-way video contact with hazmat officers and command through the use of Facetime. upon entry E525 escorted entry team one to the hot zone and acted as RIT. The location of the lab was on the second floor in room 211. Entry team one brought four gas meters, PID, thermal imager, temperature gun, camera and bear claws.

Upon entry, readings were 0ppm H2S, 0% LEL, 20.9% O2, 0PPM CO. Additionally there were no changes in the Barclaw papers indicating a normal non reactive atmosphere. During investigation, the source of the smoke which is better described as a cold vapor that emitted and disipated within a few inches of the source was emanating from a hose attached to a machine located inside a open top plastic box with an amber colored chemical jar located inside. The jar contained waste byproducts and did not appear to be the source of the vapor. With further investigation it was believed that helium from a helium tank was supplying gas to the machine which was producing the vapor. Instructions were given over the radio with the help of the video link established to turn off the machine, shut down the power to the pumps and isolate the helium supply. After mitigation, atmospheric monitoring was rechecked and the reading had not changed from our initial. The bearclaw papers again had no reaction and no change. Entry team one exited the structure with E525's crew to hotwash on scene.

RESPONSIBLE PARTY	OTHER PARTY
Name: David Farris	Name:
Company: George Mason University	Company:
Address: 10910 George Mason Circle	Address:
Phone#: 703-993-2507	Phone#:
Notes: Executive Directive of Safety Emergency Managemen	Notes:

NOTIFICATIONS/CONTACTS	
Date: 9/8/2016	Date:
Time: 1:15am	Time:
Name: Shalick Tarpley	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


EDWARDS

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

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PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

RESPONSIBLE PARTY	OTHER PARTY
Name: David Farris	Name:
Company: George Mason University	Company:
Address: 10910 George Mason Circle	Address:
Phone#: 703-993-2507	Phone#:
Notes: Executive Directive of Safety Emergency Managemen	Notes:

NOTIFICATIONS/CONTACTS	
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Time: 1:15am	Time:
Name: Shalick Tarpley	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


EDWARDS

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160027935	Date: 9/12/2016
Location:1510 Cherry Hill Rd	Time: 17:42
Report Completed By: Lt. Schwab	Incident Commander: Captain Hamby
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Received a phone call from communications regarding a possible boat leaking fuel in the Potomac river at Tim's River Shore. I advised that the first due engine company should go out, investigate and put eyes on it. HMO501 was called and advised of the situation, he informed me that DEQ and the coast guard were already aware of the issue. At 20:36 E523 requested a phone consult, E523's officer stated that there was a boat approximately 24' - 26' long that had sunk up to the windshield in the water with an active leak of gasoline. He estimated the fuel tank to be anywhere from 75-150 gallons and was unable to determine how much had leaked out, there was a sheen of about 5 miles on the water. No one at the business knew who the owner of the vessel was or what caused it to sink. E523's officer was concerned about a strong smell of gasoline that the wind was blowing into the direction of Tim's River Shore. I advised him to monitor the area and take readings. Readings were normal outside of the business and inside the business, there was just the smell of gasoline. After speaking with units on scene the petty officer for the coast guard was called, he was already aware of the situation and was in contact with his chief. He advised that they had not made a decision on whether they would respond or not, but they did not want to put any booms on the water since it would create more of a hazard by increasing the concentration of gasoline and possibly causing higher readings. HMO502 was advised of the situation and agreed that there was no life safety hazard just a nuisance to the public.

RESPONSIBLE PARTY	OTHER PARTY
Name: Unknown	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS			
Date:	9/12/2016	Date:	9/12/2016
Time:	2035	Time:	2108
Name:	Petty Officer	Name:	Chris
Comp/Agency:	Coast Guard	Comp/Agency:	VAEOC
Notes:		Notes:	

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160027935	Date: 9/12/2016
Location:1510 Cherry Hill Rd	Time: 17:42
Report Completed By: Lt. Schwab	Incident Commander: Captain Hamby
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Received a phone call from communications regarding a possible boat leaking fuel in the Potomac river at Tim's River Shore. I advised that the first due engine company should go out, investigate and put eyes on it. HMO501 was called and advised of the situation, he informed me that DEQ and the coast guard were already aware of the issue. At 20:36 E523 requested a phone consult, E523's officer stated that there was a boat approximately 24' - 26' long that had sunk up to the windshield in the water with an active leak of gasoline. He estimated the fuel tank to be anywhere from 75-150 gallons and was unable to determine how much had leaked out, there was a sheen of about 5 miles on the water. No one at the business knew who the owner of the vessel was or what caused it to sink. E523's officer was concerned about a strong smell of gasoline that the wind was blowing into the direction of Tim's River Shore. I advised him to monitor the area and take readings. Readings were normal outside of the business and inside the business, there was just the smell of gasoline. After speaking with units on scene the petty officer for the coast guard was called, he was already aware of the situation and was in contact with his chief. He advised that they had not made a decision on whether they would respond or not, but they did not want to put any booms on the water since it would create more of a hazard by increasing the concentration of gasoline and possibly causing higher readings. HMO502 was advised of the situation and agreed that there was no life safety hazard just a nuisance to the public.

RESPONSIBLE PARTY	OTHER PARTY
Name: Unknown	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS			
Date:	9/12/2016	Date:	9/12/2016
Time:	2035	Time:	2108
Name:	Petty Officer	Name:	Chris
Comp/Agency:	Coast Guard	Comp/Agency:	VAEOC
Notes:		Notes:	

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160028884	Date: 9/21/2016
Location:3001 Old Bridge Road	Time: 14:56
Report Completed By: Lt. Stephen Horvath	Incident Commander: Captain Bill Phillips
HM 506 Personnel Responding: Horvath, Stephen M., Clark, Graham, Cone, Matthew, Gibson, Ricardo, Parisi, Joseph HS 516 Personnel Responding: N/A Other HMT Personnel Responding: Captain Kim Stewart (consulted on phone)	

INCIDENT DESCRIPTION
Recieved a phone consult from the UFRO for Captain Phillips on E514. E514 was on the scene of Woodbridge H.S. and they had a complaint of pepper spray (in the air and nothing could visibly be seen) that was released in one of the school restrooms. I aksed if anyone at the school had been threatened or felt they could be? Staff told E514, no. I asked when people moved to fresh air if the symtoms of the assumed pepper spray exposure (eyes/throat burning) got better and everyone said yes. I asked if anyone was injured or was going to be transported and the answer was no to both questions. I also asked why they thought it was Pepper spray and everyone on the scene stated because of past experiences with pepper spray. I asked Captain Phillips if they monitored the area with there 4 gas and he stated yes and all readings were within normal limits. I advised Captain Phillips that there was no need for HM506 to respond and the only thing they could do to disipate it is to ventilate the structure. I advised Captain Phillips to utilize a PPV fan or MAU 514. Captain Phillips said he understood and I advised him to call me back if he had any other questions. I also notified the VA EOC for reporting purposes only.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 09-21-2016	Date:
Time: 1603	Time:
Name: Archer Stark	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes: Notification ONLY	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160028884	Date: 9/21/2016
Location:3001 Old Bridge Road	Time: 14:56
Report Completed By: Lt. Stephen Horvath	Incident Commander: Captain Bill Phillips
HM 506 Personnel Responding: Horvath, Stephen M., Clark, Graham, Cone, Matthew, Gibson, Ricardo, Parisi, Joseph HS 516 Personnel Responding: N/A Other HMT Personnel Responding: Captain Kim Stewart (consulted on phone)	

INCIDENT DESCRIPTION
Recieved a phone consult from the UFRO for Captain Phillips on E514. E514 was on the scene of Woodbridge H.S. and they had a complaint of pepper spray (in the air and nothing could visibly be seen) that was released in one of the school restrooms. I aksed if anyone at the school had been threatened or felt they could be? Staff told E514, no. I asked when people moved to fresh air if the symtoms of the assumed pepper spray exposure (eyes/throat burning) got better and everyone said yes. I asked if anyone was injured or was going to be transported and the answer was no to both questions. I also asked why they thought it was Pepper spray and everyone on the scene stated because of past experiences with pepper spray. I asked Captain Phillips if they monitored the area with there 4 gas and he stated yes and all readings were within normal limits. I advised Captain Phillips that there was no need for HM506 to respond and the only thing they could do to disipate it is to ventilate the structure. I advised Captain Phillips to utilize a PPV fan or MAU 514. Captain Phillips said he understood and I advised him to call me back if he had any other questions. I also notified the VA EOC for reporting purposes only.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 09-21-2016	Date:
Time: 1603	Time:
Name: Archer Stark	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes: Notification ONLY	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160029027	Date: 9/23/2016
Location:7730 Cedar Branch	Time: 01:37
Report Completed By: Doug McCabe	Incident Commander: Tom Wood
HM 506 Personnel Responding: Mccabe, Snitwongse, C.Malone Waln HS 516 Personnel Responding: Newell, Sanchez, Carter Other HMT Personnel Responding: Matt Adkins	

INCIDENT DESCRIPTION	
HM506 was dispatched to assist Barb Quick with a garage that had materials for producing fireworks or explosive devices. HM506 and HS516 arrived and got a brief from BC501 (Wood) on what they had found. FM Quick showed me around the garage and multiple products were found and in marked containers. No product had spilled. Multiple devices in a brown wrapper and fuse were seen. We meet outside the garage and discussed having EOD on scene and she advised that they were not coming. Unsure of why. HMO501 arrived and we discussed not opening and testing the materials due to their nature. It was agreeded upon that HMO501 would stay on scene and assist the FMO on how to remedy the situation. No monitoring was performed by HM506.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 9/23/16	Date:
Time: 0328	Time:
Name: Tarpley	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160029027	Date: 9/23/2016
Location:7730 Cedar Branch	Time: 01:37
Report Completed By: Doug McCabe	Incident Commander: Tom Wood
HM 506 Personnel Responding: Mccabe, Snitwongse, C.Malone Waln HS 516 Personnel Responding: Newell, Sanchez, Carter Other HMT Personnel Responding: Matt Adkins	

INCIDENT DESCRIPTION	
HM506 was dispatched to assist Barb Quick with a garage that had materials for producing fireworks or explosive devices. HM506 and HS516 arrived and got a brief from BC501 (Wood) on what they had found. FM Quick showed me around the garage and multiple products were found and in marked containers. No product had spilled. Multiple devices in a brown wrapper and fuse were seen. We meet outside the garage and discussed having EOD on scene and she advised that they were not coming. Unsure of why. HMO501 arrived and we discussed not opening and testing the materials due to their nature. It was agreeded upon that HMO501 would stay on scene and assist the FMO on how to remedy the situation. No monitoring was performed by HM506.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 9/23/16	Date:
Time: 0328	Time:
Name: Tarpley	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160029059	Date: 9/23/2016
Location:1703 Iowa Court	Time: 09:30
Report Completed By: HMO501 Adkins	Incident Commander: Capt. Scott (E512)
HM 506 Personnel Responding: Lt. Anthony - Phone Consult HS 516 Personnel Responding: Other HMT Personnel Responding: HMO501 Adkins	

INCIDENT DESCRIPTION
Reported odor that caused irritation to residents in the home. E512 crew approached home and had same slight odor and irritation, on air they investigated further and found normal 4 gas readings and no indication of source. E512 requested phone consult with Duty HAZMAT Teachnician Lt. Anthony. Lt. Anthony took information and made contact with HMO501 who was closer to the location and took the call to assist with determining source of the issue. Prior to arrival resident's daughter came forth and stated that she had released some type of mace/pepper spray and was afraid to admit the mistake. Container was secured, home ventilated. HMO501 was placed in service prior to arrival.

RESPONSIBLE PARTY	OTHER PARTY
Name: Julio Marizo	Name:
Company:	Company:
Address: 1703 Iowa Court	Address:
Phone#: 571-398-1001	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 09/23/2016	Date:
Time: 11:09	Time:
Name: Frederick	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160029059	Date: 9/23/2016
Location:1703 Iowa Court	Time: 09:30
Report Completed By: HMO501 Adkins	Incident Commander: Capt. Scott (E512)
HM 506 Personnel Responding: Lt. Anthony - Phone Consult HS 516 Personnel Responding: Other HMT Personnel Responding: HMO501 Adkins	

INCIDENT DESCRIPTION
Reported odor that caused irritation to residents in the home. E512 crew approached home and had same slight odor and irritation, on air they investigated further and found normal 4 gas readings and no indication of source. E512 requested phone consult with Duty HAZMAT Teachnician Lt. Anthony. Lt. Anthony took information and made contact with HMO501 who was closer to the location and took the call to assist with determining source of the issue. Prior to arrival resident's daughter came forth and stated that she had released some type of mace/pepper spray and was afraid to admit the mistake. Container was secured, home ventilated. HMO501 was placed in service prior to arrival.

RESPONSIBLE PARTY	OTHER PARTY
Name: Julio Marizo	Name:
Company:	Company:
Address: 1703 Iowa Court	Address:
Phone#: 571-398-1001	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 09/23/2016	Date:
Time: 11:09	Time:
Name: Frederick	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160029165	Date: 9/24/2016
Location:9405 Devlins Grove Pl	Time: 10:25
Report Completed By: Schwab	Incident Commander: Chief Deem
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Received a request for phone consult with BC501, he was at Station 25 and noticed a blue fuel container sitting outside the station. He asked the crews there what it was doing there and no one knew. The stated that it had been there since last night. The contatiner was blue, about the size for 5 gallons and full. There was nothing around it that would suggest an HME, no wires, electronic devices, etc. The container was not leaking and showed no signs of damage. I advised him to have the crews at station 25 take readings around the container. The crews took readings and all readings were normal, they also cracked open the container to take readings and those were also normal. They did say that the it had the smell of gasoline. I advised them that there is no hazard to the public and they need to get incontact with Atlas for proper disposal.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Nokesville Volunteer Fire Department	Company:
Address: 9405 Devlins Grove Pl	Address:
Phone#: 703-367-9700	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: No notifications were made to the EOC, since there was no hazard.
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160029165	Date: 9/24/2016
Location:9405 Devlins Grove Pl	Time: 10:25
Report Completed By: Schwab	Incident Commander: Chief Deem
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Received a request for phone consult with BC501, he was at Station 25 and noticed a blue fuel container sitting outside the station. He asked the crews there what it was doing there and no one knew. The stated that it had been there since last night. The contatiner was blue, about the size for 5 gallons and full. There was nothing around it that would suggest an HME, no wires, electronic devices, etc. The container was not leaking and showed no signs of damage. I advised him to have the crews at station 25 take readings around the container. The crews took readings and all readings were normal, they also cracked open the container to take readings and those were also normal. They did say that the it had the smell of gasoline. I advised them that there is no hazard to the public and they need to get incontact with Atlas for proper disposal.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Nokesville Volunteer Fire Department	Company:
Address: 9405 Devlins Grove Pl	Address:
Phone#: 703-367-9700	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: No notifications were made to the EOC, since there was no hazard.
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160029579	Date: 9/27/2016
Location:3106 Chesapeake Dr #102	Time: 20:41
Report Completed By: Lt. Schwab	Incident Commander: BC Brodie
HM 506 Personnel Responding: Lt. Schwab, T-I Shipman, T-II Sweet HS 516 Personnel Responding: Other HMT Personnel Responding: T-II Byler	

INCIDENT DESCRIPTION

At 1830 we received a call from the UFRO regarding the police needing our assistance on a possible white powder call. PD had reason to suspect that the owner of the above address may have some type of hazardous material in his home but were not sure. The suspect had sent an envelope to Ceasers palace in New Jersey and another to a real estate office here off Country Club Dr. The envelopes contained a white powder and a note with random writings. The suspect had a history of schizophrenia and had been commited the day prior. PD contacted us requesting us to support them when they make entry to serve a search warrant. At this time neither the FBI or the JTTF had been notified of such an incident. HMO 501 was called to inform him of what was going on and see if he had heard anything. This was the first time he had heard anything and he made the notification to the FBI about what was going on. The FBI was aware of the letter sent to New Jersey, it was tested and came back as a crushed pill and it was negative for any threats. At 2035 I called the officer to let her know this information and she was still requesting our assistance. At 2041 we were dispatched and went enroute to the location since all members of PD were not on scene yet. After members of CSI, narcotics and the detectives arrived on scene we had our briefing of the situation. According to PD, the apartment had not been cleared yet, officers only went into the living room area. Based on this information and the suspects history I decided to not put any Fire department personnel into the building until it had been cleared incase of any possible explosives or booby traps. Several members from the narcotics team made entry into the apartment, one was on SCBA and had 4- gas monitor supplied by us. E523's crew acted as RIT in case of something happened. At 22:29 the team had entered the apartment building and at 22:32 gained access to apartment #102. Upon opening the door they stated that the monitor readings were normal. While searching the apartment they gave us updated information from the 4-gas, the readings stayed normal the entire time. The team exited the apartment at 24:07. After speaking with the narcotics officer, he stated that there was no sign of any hazardous materials. They only found pills and a few locked cabinets, tool boxes and closets. They felt comfortable with placing us in service and not needing our equipment anymore. This information was given to BC591 and all units were placed in service

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name: First Sergeant Rodriguez
Company:	Company: PWC PD
Address: 3106 Chesapeake Dr #102	Address:
Phone#:	Phone#: 703-906-2652
Notes:	Notes:

NOTIFICATIONS/CONTACTS

Date: 09/27/2016	Date:
Time: 23:35	Time:
Name: Ershawn	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160029579	Date: 9/27/2016
Location:3106 Chesapeake Dr #102	Time: 20:41
Report Completed By: Lt. Schwab	Incident Commander: BC Brodie
HM 506 Personnel Responding: Lt. Schwab, T-I Shipman, T-II Sweet HS 516 Personnel Responding: Other HMT Personnel Responding: T-II Byler	

INCIDENT DESCRIPTION

At 1830 we received a call from the UFRO regarding the police needing our assistance on a possible white powder call. PD had reason to suspect that the owner of the above address may have some type of hazardous material in his home but were not sure. The suspect had sent an envelope to Ceasers palace in New Jersey and another to a real estate office here off Country Club Dr. The envelopes contained a white powder and a note with random writings. The suspect had a history of schizophrenia and had been commited the day prior. PD contacted us requesting us to support them when they make entry to serve a search warrant. At this time neither the FBI or the JTTF had been notified of such an incident. HMO 501 was called to inform him of what was going on and see if he had heard anything. This was the first time he had heard anything and he made the notification to the FBI about what was going on. The FBI was aware of the letter sent to New Jersey, it was tested and came back as a crushed pill and it was negative for any threats. At 2035 I called the officer to let her know this information and she was still requesting our assistance. At 2041 we were dispatched and went enroute to the location since all members of PD were not on scene yet. After members of CSI, narcotics and the detectives arrived on scene we had our briefing of the situation. According to PD, the apartment had not been cleared yet, officers only went into the living room area. Based on this information and the suspects history I decided to not put any Fire department personnel into the building until it had been cleared incase of any possible explosives or booby traps. Several members from the narcotics team made entry into the apartment, one was on SCBA and had 4- gas monitor supplied by us. E523's crew acted as RIT in case of something happened. At 22:29 the team had entered the apartment building and at 22:32 gained access to apartment #102. Upon opening the door they stated that the monitor readings were normal. While searching the apartment they gave us updated information from the 4-gas, the readings stayed normal the entire time. The team exited the apartment at 24:07. After speaking with the narcotics officer, he stated that there was no sign of any hazardous materials. They only found pills and a few locked cabinets, tool boxes and closets. They felt comfortable with placing us in service and not needing our equipment anymore. This information was given to BC591 and all units were placed in service

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name: First Sergeant Rodriguez
Company:	Company: PWC PD
Address: 3106 Chesapeake Dr #102	Address:
Phone#:	Phone#: 703-906-2652
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 09/27/2016	Date:
Time: 23:35	Time:
Name: Ershawn	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160031840	Date: 10/17/2016
Location:18533 Kerill Rd Dumfries VA	Time: 16:26
Report Completed By: Forbes	Incident Commander: N/A
HM 506 Personnel Responding: Forbes, Cook, Mclaurin, Popsuy HS 516 Personnel Responding: N/A Other HMT Personnel Responding: N/A	

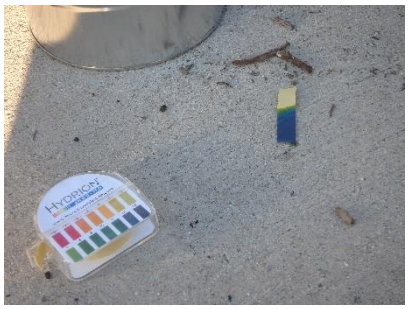
INCIDENT DESCRIPTION	
HM506 was requested by Capt. Ferguson (FM502) to assist the Fire Marshals with an investigation. HM506 arrived on scene and meet with Lt Smiljanich (FM517) who stated that he had collected fire debris from a vehicle fire investigation and placed in a lined gallon metal can. A few minutes later Lt. Smiljanich stated that he saw the can lid bowing, then the lid popped off the gallon can. HM506 personal sampled two one gallon cans, the can lids were not on. HM506 used a four gas meter, temperature gun PID, PH paper, and Hazmat ID to test the samples. The four gas meter read up to 13 ppm of CO at the top of the can with normal reading of O2, H2S and LEL. Temperature gun read ambient temperature (85.5). PID showed normal readings. The PH paper showed a reading of 13. Hazmat ID showed .97 of water. The sample was reacting (popping) but was contained to the one gallon can. HM506 personal advised Lt. Smilijanich to not seal the lid of the can until there was no further active reaction.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name: Lt. Smiljanich
Company:	Company: PWC DFR
Address:	Address:
Phone#:	Phone#: 703 792 6055
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 10/17/2016	Date:
Time: 21:00	Time:
Name: Archer Stark	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160033951	Date: 11/5/2016
Location:11481 Colvin Ln	Time: 09:19
Report Completed By: Schwab	Incident Commander: FM 525
HM 506 Personnel Responding: Lt. Schwab, T-II Clark, T-II Abel, T-I Cone, T-I Gibson HS 516 Personnel Responding: Other HMT Personnel Responding:	

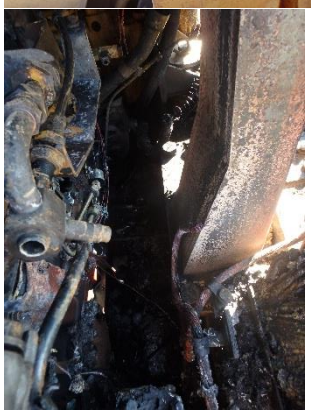
INCIDENT DESCRIPTION
Received a call from communications requesting a Hazmat consult from FM525 at 0915. They were on scene of an arson investigation that happened earlier this morning involving a front loader. While conducting their investigation they noticed that there was a diesel fuel leak and they were unsure of where it was coming from. They advised that it was just filled up the day before and had up to 55 gallons of fuel on board. HM506 and E506 went priority 2, to assist the FM's with leak control. When we arrived on scene we investigated and found a steady leak from under the loader. We placed a pop up pool to contain the leaking fuel and then tried to see if there was a fuel shut off. Due to the fire damage of the engine we were unable to locate any fuel shut off or the fuel lines. There was also a metal skid located under the loader that would allow us access. The owner of the front loader was on scene and given the information for contacting a cleanup contractor. The former owner of the property was on scene and he sold the land to Ryan Homes for development.

RESPONSIBLE PARTY	OTHER PARTY
Name: Rick Markell	Name: Ronald Lawson
Company:	Company:
Address:	Address:
Phone#: 703-906-1162	Phone#: 703-928-7942
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 11/5/2016	Date:
Time: 18:26	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160035014	Date: 11/15/2016
Location:2051 Daniel Stuart Square, Woodbridge	Time: 08:58
Report Completed By: Hubbel, M	Incident Commander: E523
HM 506 Personnel Responding: Weaver HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
HM506 had a phone consult with E512. E512 Officer advised that they were on the scene, they discovered that an individual had overfilled vehicle tank, failed to report it and left scene. Approximately 5-10 gallons were released. Wawa personnel applied absorbant. No waterways were effected. No recoverable product. Store Manager Jim Lacey has contacted Lewis Environmental clean up company 800-258-5585.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Jim Lacey	Name:
Company: Wawa	Company:
Address: 2051 Daniel Stuart Square, Woodbridge	Address:
Phone#: 703-493-9858	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 11/15/2016	Date:
Time: 13:33 hrs	Time:
Name: Thelma	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD160035245	Date: 11/17/2016
Location:11301 Braden Drive, Manassas, VA, 20109	Time: 14:04
Report Completed By: Technician II Graham Clark	Incident Commander: Captain Robert Faye/Battaltion Chief Curtis Brodie
HM 506 Personnel Responding: Lieutenant Mark Schwab, Technician II Graham Clark, Technican I Ricardo Gibson HS 516 Personnel Responding: N/A Other HMT Personnel Responding: Matt Adkins, Rahil Nawaz (E525), Paul Taylor (E525)	

INCIDENT DESCRIPTION
At 1404 E525 was dispatched for an outside gas leak at 11301 Braden Drive, caller reported a construction vehicle had driven over a cover for a 1000 lb propane cylinder and product was leaking out. E525 Officer (Technician II Kevin Dewhurst) requested a hazmat consult with Duty Hazmat upon arrival on scene. E525 conducted initial air monintoring with a 4-gas monitor (LEL: 0% but read high when within 2 feet of dome, O2: 20.9%, H2S 0 PPM, CO: 0 PPM), evaucuated the immediate area to approximately 300 feet in all directions. E525 reported a loud hissing noise coming from the tank cylinder, and took no further action until arrival of hazmat unit. HM506 arrived on scene, along with HMO 501 Matt Adkins, and had E525 take reconassiance photographs since they were in full personal protective gear and SCBA. BC 501 arrived on scene and established command. HM506 decided to make entry and attempt to slow/stop the leak with Plug'n'Dike or attempt to attach an adapater to mitigate the hazard. HM506 made entry (Clark and Nawaz) and were unsuccessful with slowing the leak. E511 arrived on scene to assist with water supply and M525 arrived on scene. Fire Marshal Mikel Hubbel and Safety Officer Robert L Presgrave arrived on scene. HM506 (Clark and Nawaz) made a second entry to attempt a freeze patch on the leak, HM506 was successful in slowing down the leak. BC501 and HMO 501 turned the scene over to Blossman Gas Inc. to transfer the remaining product and make repair. No further action taken.

RESPONSIBLE PARTY	OTHER PARTY
Name: Jeff Jenkins	Name: Chris Capell
Company: Blossman Gas Inc.	Company: Dizzy Pig BBQ Company
Address: 4601 Hanshaw Road, Ocean Springs, MS 39564	Address: 8763 Virginia Meadows Drive, Manassas, VA 20109
Phone#: 804-283-2901	Phone#: 703-273-3580
Notes:	Notes: Property Owner

NOTIFICATIONS/CONTACTS	
Date: 11/17/16	Date:
Time: 18:10	Time:
Name: John	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:

NOTIFICATIONS/CONTACTS

Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

Construction Contractor
RW Murray Company
Address: 10440 Balls Ford Rd #100, Manassas, VA 20109
Phone: (703) 334-2100
Roy Ryan, Project Manager.

It was their workers who struck the dome and caused the issue, one could argue that they are the responsible party but Matt Adkins wants to put the Gas company as that person, he is going to do some followup with them about their policies and procedures.

HAZMAT Officer Comments:


REMOTE
READY

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160036433	Date: 11/28/2016
Location:Bristow Rd / Independent Hill Dr	Time: 1549
Report Completed By: Technician I Laganga	Incident Commander: Lt. Forbes
HM 506 Personnel Responding: Forbes, Laganga, Deghand, McLaurin, Parisi HS 516 Personnel Responding: Other HMT Personnel Responding:	

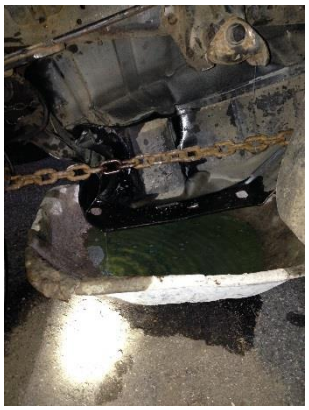
INCIDENT DESCRIPTION
E506 was dispatched for an auto accident at the above location. Upon arrival, there was a 2 vehicle accident with an active diesel leak from one of the vehicles with approximately 1 1/2 gallons already on the ground. E506 personnel applied absorbant, and used dirt to contain the leak. E506 utilized tools on scene to lift the fuel tank and place a masonry mixing container under the tank to further contain the leak. The responsible party was provided an LAPC form and advised to call a cleanup company prior to the vehicle being towed. E506 waited on scene until the cleanup company (Atlas Environmental) arrived. At the time they arrived, there was approximately 3-4 gallons of diesel fuel contained in the mixing container. At this time, the scene was turned over to the cleanup company and PD.

RESPONSIBLE PARTY	OTHER PARTY
Name: Ricky Tibbs	Name:
Company: Tibbs Masonry	Company:
Address: 13231 Tall Oak Turn Summerduck, VA 22742	Address:
Phone#: 703-283-2555	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 11/28/2016	Date:
Time: 19:50	Time:
Name: Christina	Name:
Comp/Agency: Virginia EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:




VA
TRUCK
P
T
X141-311

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160037560	Date: 12/9/2016
Location:8909 Euclid Ave, Manassas Va 20111	Time: 13:46
Report Completed By: Technician II Weaver	Incident Commander: Captain Ericson
HM 506 Personnel Responding: Captain Mccabe, Tech II Weaver, Tech I Parisi HS 516 Personnel Responding: Tech II Mirabile, Tech I Gonzalez, Tech I Carter Other HMT Personnel Responding: HMO 502 Matt Atkins	

INCIDENT DESCRIPTION
E508 arrived onscene of a dump truck that damaged the bottom of its saddle tank and was leaking diesel fuel. E508 requested phone consule with HM506. HM506 advised E508 to add the Hazmat compliment to the call. HM506 arrived and found the 110 gallon saddle tank of the dump truck was still leaking. Saddle tank was half full of product. HM506 threw a pop up pool under the tank to catch the product. E508 had damned the ditch leading up to the sewer drain. There was about 10 gallons sitting in a pool in the ditch. A unknown amount of product had entered the storm drain. HS516 look in the storm drains down stream and found that the product had run up to about 1000 feet. HS516 placed absorbant in the last storm drain to keep product from traveling any further. Tim Hughes from Public Works arrived and adviced that product had not entered the retention pond at the end of the run. HMO 501 and Public works placed a boom at the outlet into the run to keep and product from entering the pond. HM506 advised driver of the dump truck that they had to call a clean up company. Driver called Atlas Environmental Services. Atlas arrived onscene and vacuumed about 30 gallons out of the pop up pool, 10 gallons out of the ditch and 10 gallons out of the tank. HM506 turned the scene over to Atlas Environmental.

RESPONSIBLE PARTY	OTHER PARTY
Name: Celedonio Escamilla	Name: Jason Dowell
Company: Escamilla Trucking Company LLC	Company: Atlas Environmental Services
Address: 7972 Community Dr, Manassas Va 20109	Address: Lorton Va
Phone#:	Phone#: 703-339-9770
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/9/16	Date: 12/9/16
Time: 17:55	Time: 14:00
Name: Archer	Name: Tim Hughes
Comp/Agency: VA EOC	Comp/Agency: Public Works Environmental Services
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

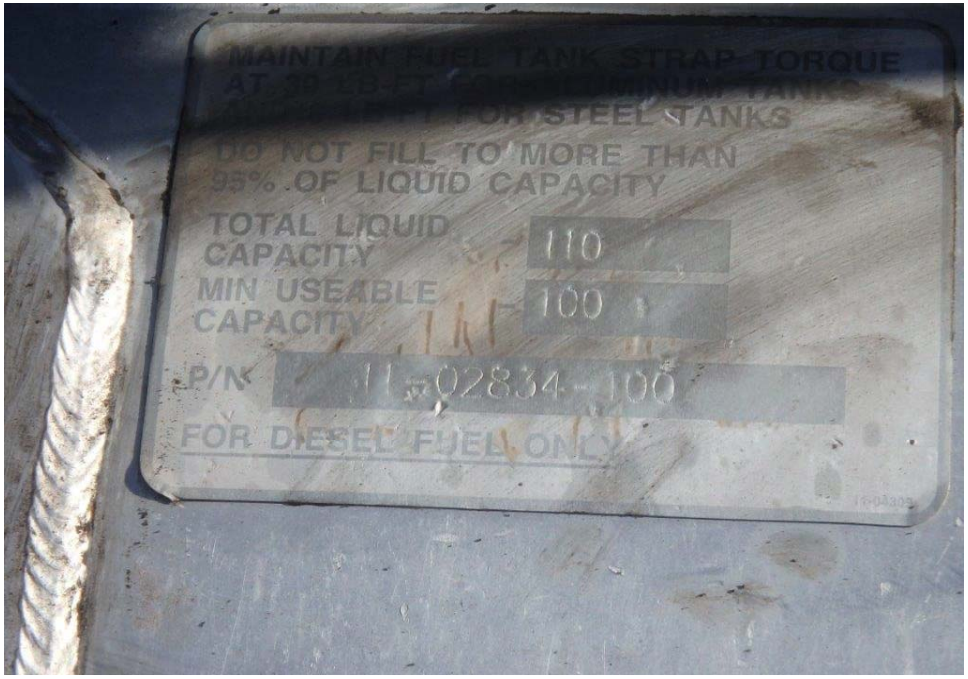
Additional Notes/Information:
HAZMAT Officer Comments:






VA TRUCK H
FEB
17
HA 113-391


5
ID 9685
GW 81900
NW 54140
5
FEB


DO NOT FILL TO MORE THAN
95% OF LIQUID CAPACITY
TOTAL LIQUID CAPACITY
110
MIN USEABLE CAPACITY
100
FOR DIESEL FUEL ONLY

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

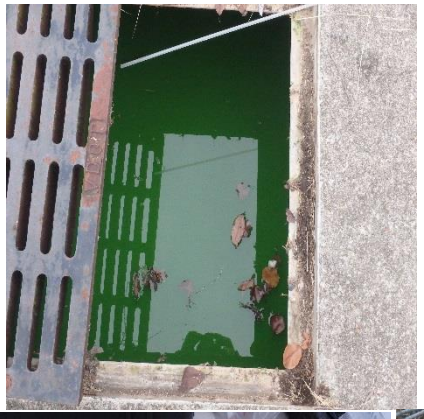
INCIDENT INFORMATION	
Fire Dept. Incident #: FD160037797	Date: 12/11/2016
Location:3514 Old Bridge Road, Woodbridge, VA. 22192	Time: 14:57
Report Completed By: TII Matthew Schultz	Incident Commander: BC 506 (K. Bolland)
HM 506 Personnel Responding: Lt. Mark Schwab, TII Graham Clark, TI Matthew Cone, TI Ricardo Gibson, TI Adam Lienau HS 516 Personnel Responding: Lt. Stephen Horvath, TII Jay Byler, TII Matthew Schultz, TI Stephen Ching, TI Louis Raniszewski Other HMT Personnel Responding: N/A	

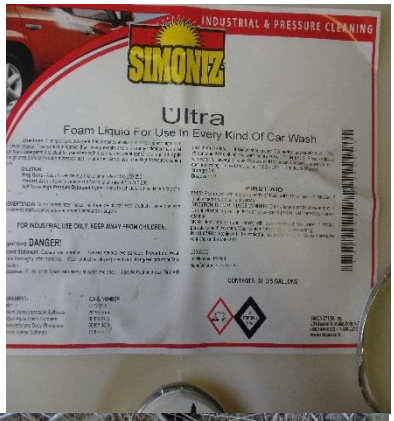
INCIDENT DESCRIPTION
Company 506 conducted a phone consult regarding a substance that appeared to have entered a creek near the dispatched address, which was an Exxon gas station and car wash at 3514 Old Bridge Road. HAZMAT units were dispatched to the scene. BC 506 established command. Upon arrival, HS516 crew utilized the 4-gas and made a visual inspection of the carwash. Default readings did not change on the 4-gas throughout the incident (LEL: 0%, O2: 20.9%, H2S: 0 PPM, CO: 0 PPM. Upon HM506 arrival, crews set up a sampling station and prepared the HAZMAT ID 360 for use. Crew members also walked the length of the affected creek to determine how far downstream the substance had traveled. Crews obtained five samples of the substance, beginning at the carwash soap drum, continuing to the 2 circle manholes outside of the carwash, the square storm drain on the edge of the parking lot on the exit side of the car wash as well as the creek itself. Crews labeled the vials and took pictures. The control sample (sample 1), which was the carwash soap and was labeled as Simoniz Ultra, resulted in an approximate PH reading of 10. Samples 2, 3, 4, and 5 all appeared neutral. All samples taken on the HAZMAT ID 360 resulted in approximately 98% confidence that the product was water-based. Residual components resulted in approximately 60% confidence of non-water content. Two booms from HS516 were staked across the creek. The first was close to where the product appeared to be entering the creek, and the second was placed at the furthest point that personnel could see the product in the creek, approximately 200' away. A DEQ representative was already on scene when HS516 arrived on scene. The DEQ rep had also already made contact with the owner and told us the owner was enroute to the scene. When the owner arrived on scene, Lt. Horvath and the DEQ rep. explained the situation to the business owner. Lt. Horvath provided the owner with an LEPC form and explained what the owner was responsible for as the responsible party. The owner stated he understood and was going to contact a clean up contractor from the list provided. The scene was turned over to DEQ rep. VA Eoc was contacted for report purposes only. The area Virginia HAZMAT officer contacted me to see if we required any assistance. I told him that we did not, just that we had placed the call to VAEOC. Other photos will be attached in separate email.

RESPONSIBLE PARTY	OTHER PARTY
Name: Jeff McPherson	Name:
Company: Exxon	Company:
Address: 3514 Old Bridge Road	Address:
Phone#: (703) 785-7166	Phone#:
Notes: Business Owner	Notes:

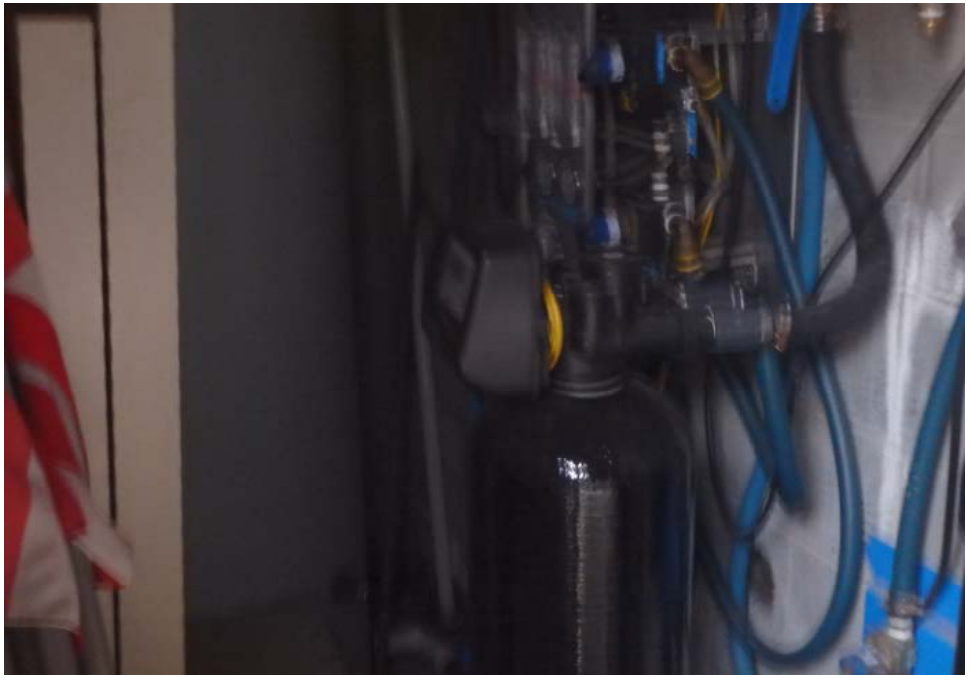
NOTIFICATIONS/CONTACTS	
Date: 12/11/2016	Date:
Time: 18:04	Time:
Name: Christina	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date: 12/11/2016	Date:
Time: 15:00	Time:
Name: Michael Clark	Name:
Comp/Agency: DEQ	Comp/Agency:
Notes: Arrived on the scene	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: Additional photos will be attached in a separate email.
HAZMAT Officer Comments:

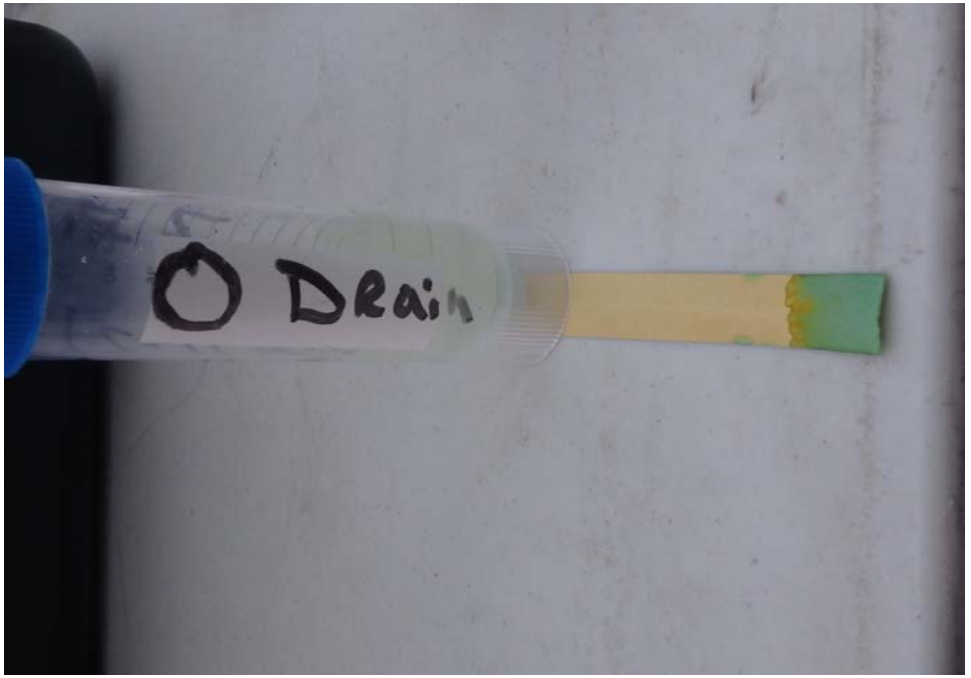


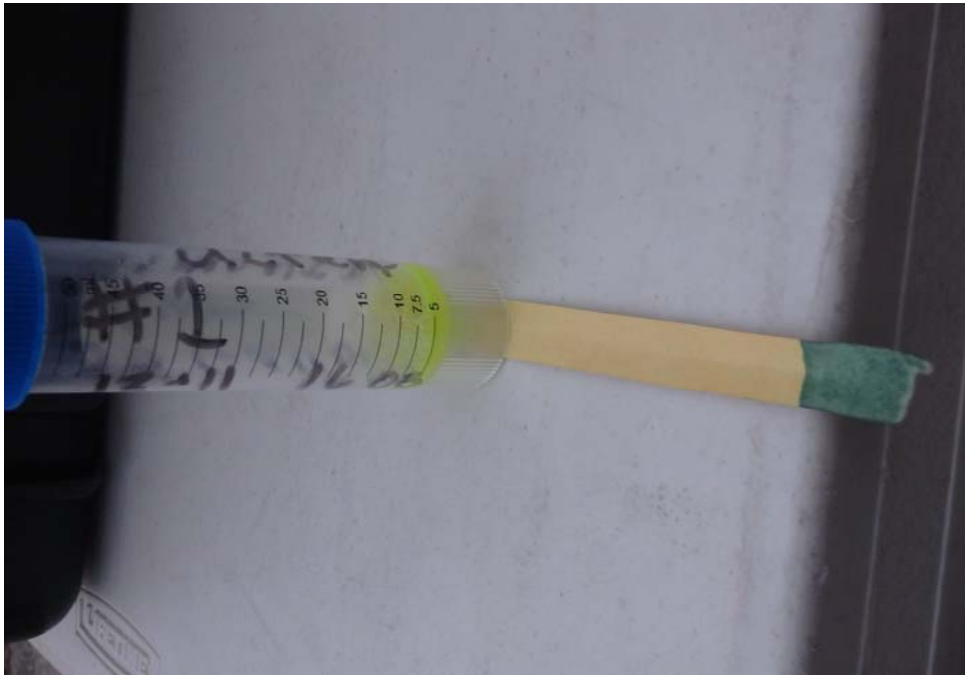

INDUSTRIAL & PRESSURE CLEANING
SIMONIZ
Ultra
Foam Liquid For Use In Every Kind Of Car Wash
FIRST AID
DANGER!

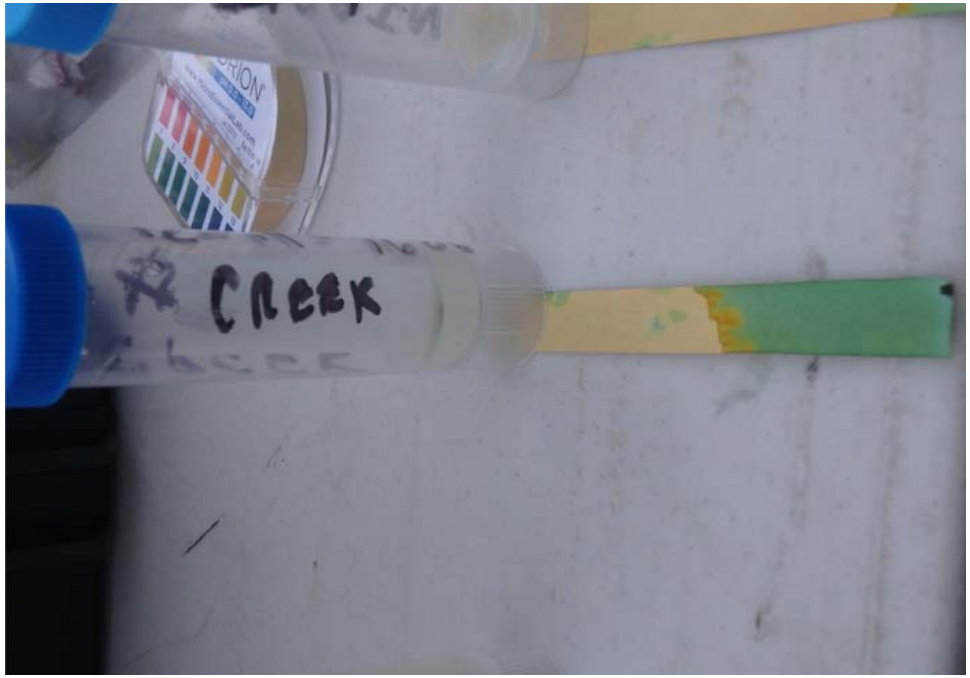

3514 Old Bridge Rd.




Drain


Drain




CREEK


Exit
Car Wash


Smoketown RD

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 160038745	Date: 12/18/2016
Location:3514 Old Bridge Rd, Woodbridge Va 22192	Time: 15:36
Report Completed By: Tech II Weaver	Incident Commander: BC 506 Godin
HM 506 Personnel Responding: Lt Miller, Tech II Weaver, Tech I Waln HS 516 Personnel Responding: Tech II Mirabile, Tech II Sanchez, Tech I Gonzalez, Tech I Carter Other HMT Personnel Responding: HM502 Stewart	

INCIDENT DESCRIPTION
HM506 was called out to Exxon Old Bridge for substance that was in the storm drain that looked like coolant. Enroute HM506 was informed that Hazmat was out on this call last Sunday Dec 11 for the same call. HM506 found that the car wash was leaking soap into the storm drain and was running down the ditch. HM506 damned at farthest point to keep any product from going any further. On the previous call HM506 had pleaced boomes to keep product from going down the water way. HM502 arrived onscene and worked with store owner on cleaning up the product. He was adviced to not use the car wash till the product was cleaned up. DEQ arrived onscene and was working with HM502 to resolve the issue. HM501 notified watershed that the incident had not been resolved.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Exxon Old Bridge	Company:
Address: 3514 Old Bridge Rd, Woodbridge VA 22192	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/18/16	Date: 12/18/16
Time: 1600	Time: 1600
Name: Michael Clark	Name: Aveni, Marc
Comp/Agency: DEQ	Comp/Agency: Watershed
Notes:	Notes:
Date: 12/18/16	Date: 12/18/16
Time: 1600	Time: 1800
Name: Lt Culbertson	Name: Chris
Comp/Agency: PWC Fire Marshal	Comp/Agency: VA EOC
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
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Date:	Date:
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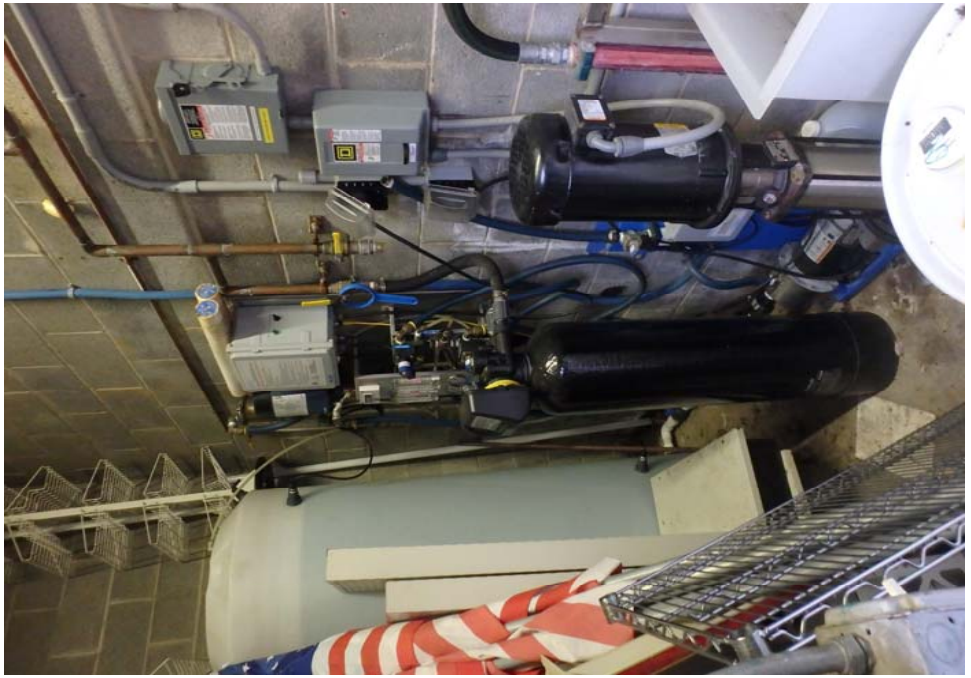
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:






SIMONIZ
Ultra




BFGoodrich

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 2016-0050906	Date: 12/13/2016
Location:James Madison/Lightner Road	Time: 08:00
Report Completed By: Adkins, HMO501	Incident Commander: BC Crispin
HM 506 Personnel Responding: Phone Consult HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Contacted by BC Crispin for a HAZMAT Phone Consult in regards to a trash truck fire. Responsible Party Bates Trucking, Bladensburg, MD Trash was offloaded onto pavement and run off from firefighting made it into creek and drainage ditch. HMO501 will notify Watershed and DEQ as a Courtesy. Less than 100 gallons released.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name:
Company: Bates Trucking	Company:
Address: 4305 48st Street, Bladensburg, MD	Address:
Phone#: 3017732069	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/13/2016	Date: 12/13/2016
Time: 10.09	Time: 10.10
Name: Tim Hughes	Name: Chris
Comp/Agency: PWC Watershed	Comp/Agency: VAEOC
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170001093	Date: 1/10/2017
Location: PWC Pkwy/I-95 HOV Exit 158	Time: 1447
Report Completed By: Technician II Blake Abel	Incident Commander: N/A
HS 506 Personnel Responding: N/A HS 516 Personnel Responding: N/A Other HMT Personnel Responding: N/A	

INCIDENT DESCRIPTION
I received a phone call from the PSCC/Fire Lieutenant regarding a HAZMAT phone consult with E520's officer (Captain Forbes). He advised that they were on scene of an auto accident at which a tractor trailer had been struck by a small passenger vehicle. Captain Forbes stated that there was little damage to the trailer, but that it had leaked motor oil along an approximately 300 foot length of the road. He estimated the total volume of oil in the roadway to be 3-4 gallons. He said that none of the product had entered any waterways or sewers, and that no patients had been exposed to the oil. Captain Forbes stated that VDOT had been contacted, and was en route to their location with a sand truck. I advised E520 that if they were comfortable turning the scene over to PD, no further fire department action was necessary and they could return to service.

RESPONSIBLE PARTY	OTHER PARTY
Name: Jerry Myrick Jr. (driver)	Name:
Company: 1st Class Carriers LLC	Company:
Address: 325 Mcgill Ave. Suite 524. Concord, NC 28027	Address:
Phone#: (704) 701-1917	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1/10/2017	Date:
Time: 2104	Time:
Name: Mary	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170001238	Date: 1/11/2017
Location:15210 Haymarket Dr Haymarket, VA 20169	Time: 13:50
Report Completed By: Technician II Budkiewicz	Incident Commander: Captain Reingruber
HM 506 Personnel Responding: Technician II Snitwongse, Technician II Budkiewicz, Technician I Waln, Technician I Parisi HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
BC501 responed to a reported house fire at 15210 Haymarket Drive. E504 found liquid in the cellar and reported seeing a green/blue color sheen floating on the liquid and assumed it could be oil contaminated water. BC501 requested a phone consult with duty hazmat tech. Technician II Snitwongse took the phone consult and BC501 reported the house had a 250 gallon above ground oil tank and was concerned it had leaked into the basement. BC501 reported that there was no visable runoff and normal reading were reported by E504's 4 gas. BC501 stated the homowners had just placed 10 gallons of fuel into the tank. BC501 Stated that the tank was approximatetly 1/4 full. HM506 self dispatched to the scene based on the information provided by BC501. Upon arrival HM506 conducted monitoring with the 4 gas and PID. Normal readings were noted on the 4 gas and the PID reading was 286ppm. Two samples were collected in sample tubes and tested for the presence of hydrocarbons or oil. PH was 7, water paper was positive turning from white to pink and oil paper was negative. Both samples appeared clear to visual inspection and no odor was present. The oil tank was visually inspected and no leaks were noted. HM506 determined that there were no hazards and returned the scene to E504.

RESPONSIBLE PARTY	OTHER PARTY
Name: N/A	Name: N/A
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1/11/2017	Date:
Time: 16:10	Time:
Name: John	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes: Courtesy Notification	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170001424	Date: 1/13/2017
Location:13343 Nickleson Dr	Time: 0732
Report Completed By: Lt. Schwab	Incident Commander: Lt. Quick
HM 506 Personnel Responding: Lt. Schwab, T-II Clark. T-I Gibson, T-I Lienau HS 516 Personnel Responding: N/A Other HMT Personnel Responding: Matt Adkins	

INCIDENT DESCRIPTION
Received a phone call from HMO 501 regarding an incident that FM525 was investigating. Someone had filled two tube socks full of a white powdery substance and gasoline, then tied them to the front and rear doors of the home. They were then set on fire and extinguished themselves before the homeowners had found them. FM525 wanted to confirm that the substance was not hazardous to the public. HM506 arrived on scene and spoke with FM525. She had already obtained a sample for their investigation. She did not notice any smell originally and though the white powder was from a dry chem that the homeowners used to extinguish the fire. After speaking with the homeowners she realized that powder was from the material used in the fire. The homeowners did not notice any unusual smells or odors HM506 personnel monitored the material with 4-gas, PID, PH paper, and Temp gun. There was only a hit with the PID which spiked to 55 PPB and averaged around 35 PPB. All other readings were within normal limits. A sample was taken from the front door and ran on the HAZMAT ID, it came back as bleached flour. The results were given to the FM and the scene turned over to them.

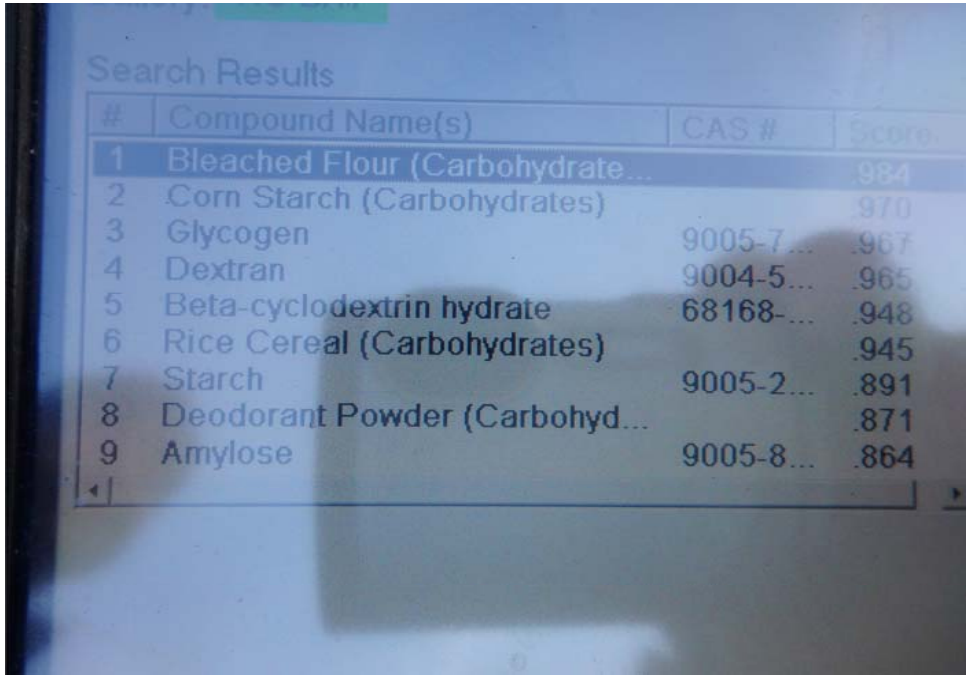
RESPONSIBLE PARTY	OTHER PARTY
Name: Paul Freeman	Name:
Company:	Company:
Address: 13343 Nickleson Dr	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1/13/2017	Date:
Time: 16:15	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


13343


Search Results
Compound Name(s) CAS # Score
1 Bleached Flour (Carbohydrate... .984
2 Corn Starch (Carbohydrates) .970
3 Glycogen 9005-7... .967
4 Dextran 9004-5... .965
5 Beta-cyclodextrin hydrate 68168-... .948
6 Rice Cereal (Carbohydrates) .945
7 Starch 9005-2... .891
8 Deodorant Powder (Carbohyd... .871
9 Amylose 9005-8... .864


NICKLESON DR
SR2070

HazMatID Report

Instrument Type: HazMatID **Serial Number:**0

Instrument Version:2.59 **Software Version:**4.3

Dll Version:4.84 **Driver Version:**0

MAC Address:0005B707431E

Spectral ResultFile:C:\SmithsDetection\QualID\HazMatID\Data\NICKLESON1\NICKLESON 1 01-10-2017 at 3h8m21s.SIR

User Name :Admin

Date :Created on 01-10-2017 02:50:20

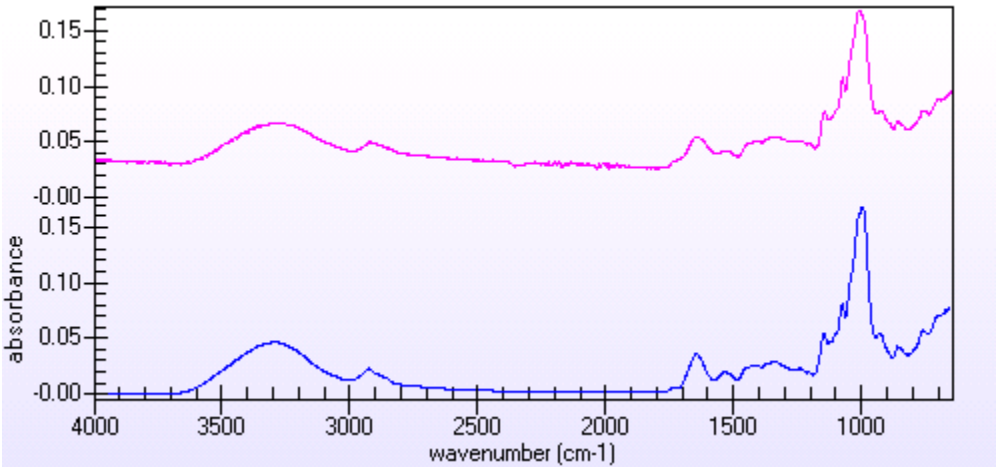
Incident Name :NICKLESON1

Sample ID :NICKLESON1 01-10-2017 at 3h8m21s.spc

Library Hit :Bleached Flour (Carbohydrates, Proteins)

Comments :

Visual Comparison:



Sample ID Library Hit

Library Search Result Table

Hit#	Quality	Text Identification
1	0.9839456	Bleached Flour (Carbohydrates, Proteins)
2	0.9704276	Corn Starch (Carbohydrates)
3	0.9667918	Glycogen
4	0.9646826	Dextran
5	0.9479716	Beta-cyclodextrin hydrate
6	0.9448074	Rice Cereal (Carbohydrates)
7	0.890729	Starch
8	0.8706934	Deodorant Powder (Carbohydrates, Zinc Oxide, Sodium Bicarbonate)
9	0.8640488	Amylose
10	0.833694	Cake Mix (Carbohydrates, Oils)

Method Information

Method Name :HazMatIDMethod
Resolution(cm-1) :4
Background Scans :32
Sample Scans :32
Minimum Quality :.4
Libraries
Searched:C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\CHEMICALWEAPONS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\COMMONCHEMICALS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\DELAWAREPESTICIDES_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\DRUGPRECURSORS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\FORENSICSDRUGS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\SMITHSEXPLOSIVES_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\TOXICINDUSTRIALCHEM_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\USERLIBRARY_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\WHITEPOWDER_M.LIB

Smiths Detection Inc
21 Commerce Dr. Danbury, CT 06810
www.smithsdetection.com

HazMatID Report

Instrument Type: HazMatID **Serial Number:**0

Instrument Version:2.59 **Software Version:**4.3

Dll Version:4.84 **Driver Version:**0

MAC Address:0005B707431E

Spectral ResultFile:C:\SmithsDetection\QualID\HazMatID\Data\NICKLESON1\NICKLESON 1 01-10-2017 at 3h8m21s.SIR

User Name :Admin

Date :Created on 01-10-2017 02:50:20

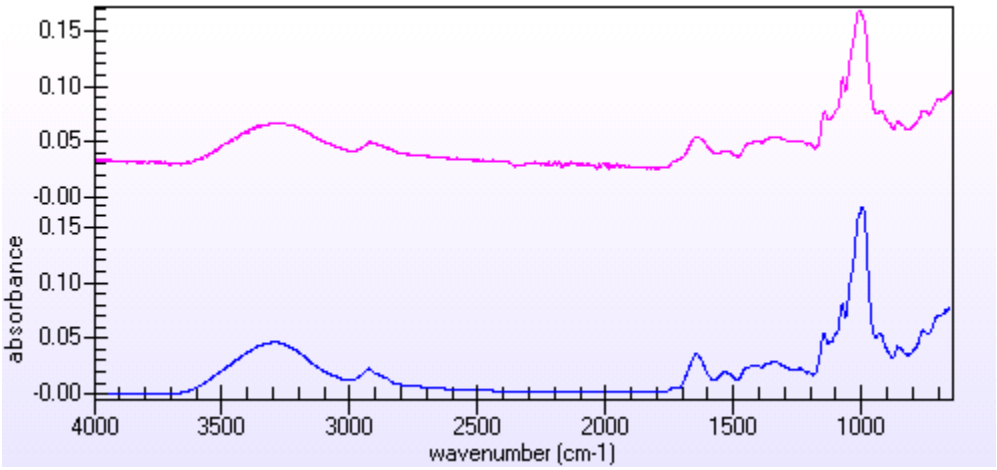
Incident Name :NICKLESON1

Sample ID :NICKLESON1 01-10-2017 at 3h8m21s.spc

Library Hit :Bleached Flour (Carbohydrates, Proteins)

Comments :

Visual Comparison:



Sample ID Library Hit

Library Search Result Table

Hit#	Quality	Text Identification
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2	0.9704276	Corn Starch (Carbohydrates)
3	0.9667918	Glycogen
4	0.9646826	Dextran
5	0.9479716	Beta-cyclodextrin hydrate
6	0.9448074	Rice Cereal (Carbohydrates)
7	0.890729	Starch
8	0.8706934	Deodorant Powder (Carbohydrates, Zinc Oxide, Sodium Bicarbonate)
9	0.8640488	Amylose
10	0.833694	Cake Mix (Carbohydrates, Oils)

Method Information

Method Name :HazMatIDMethod
Resolution(cm-1) :4
Background Scans :32
Sample Scans :32
Minimum Quality :.4
Libraries
Searched:C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\CHEMICALWEAPONS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\COMMONCHEMICALS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\DELAWAREPESTICIDES_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\DRUGPRECURSORS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\FORENSICSDRUGS_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\SMITHSEXPLOSIVES_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\TOXICINDUSTRIALCHEM_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\USERLIBRARY_M.LIB

C:\SMITHSDETECTION\QUALID\HAZMATID\LIBRARY\WHITEPOWDER_M.LIB

Smiths Detection Inc
21 Commerce Dr. Danbury, CT 06810
www.smithsdetection.com

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170002019	Date: 4/21/2017
Location:Stonewall Rd and Sudley Rd	Time: 13:09
Report Completed By: Lt. Jones	Incident Commander: BC582
HM 506 Personnel Responding: D. Jones, Z. Markley, D. Bell HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
HM506 dispatched for approx 100 gallons spilled out of a sewage truck in the area of Stonewall road and Sudley Road. While in route, BC582 arrived in the area to check. BC582 found an area near the dispatched location where some contruction vehicles were being cleaned off. There was mud on the ground from the vehicles being cleaned off. There was no sewage truck or spillage of any hazardous materials per BC582. All units placed in service. HM506 placed in service by BC582 while in route. Nothing found.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Unkown	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170002090	Date: 1/20/2017
Location:12008 Balls Ford Rd Manassas, VA	Time: 6:05
Report Completed By: Matt Adkins, Technician II Snitwongse	Incident Commander: BC504 Chief McCabe
HM 506 Personnel Responding: n/a HS 516 Personnel Responding: n/a Other HMT Personnel Responding: Technician II Snitwongse, HMO501 Matt Adkins, TII Nichol (BST504) BC McCabe	

INCIDENT DESCRIPTION
E525 was dispatched to a brush fire reported to be 'mulch on fire behind 7-11' near the intersection of Prince William Parkway and Balls Ford Road. Upon E525's arrival onscene a large fire consisting of trash and rubble was fully involved and producing large amounts of smoke. The incident was located within the Barrett Trucking property located at 12008 Balls Ford Rd. Extinguishment efforts began immediately. The trash, fire, and water runoff were initially contained to the pit. Persons claiming to be the owners of the business arrived on scene and promptly left the scene after E525's officer requested they have their workers assist in extinguishment efforts by operating excavators onscene to pull the trash pile apart to gain access to deeply rooted fire for extinguishment. After the owners left, the workers complied with our request for assistance. Soon afterwards, it was revealed that water from previous rain fall combined with water used for extinguishment started to seep off from the pile and drain into a retention basin. BC504 arrived on scene and had a earthen dam constrructed to contain the runoff from further risking impacting to local waterways. Fire marshals arrived on scene for investigation and code compliance. HM501 Arrived on scene and consulted with BC504 and fire marshals. Basic air monitoring was conducted and readings were within normal limits in the cold and warm zone. Personel involved in firefighting were restricted from entering the garbage pile. Personnel primarily remained outside of the smoke and if necessary used SCBA in full turnout gear if approaching the pile from downwind. Firefighting personnel concluded by applying ten 5 gallon buckets of AR-AFFF foam through a foam nozzle to the extinguished rubble pile. Prince William fire marshals. HM502remained on scene to control the area under investigation. Units involved in firefighting inspected and deconed their gear after clearing the call.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Barrett Trucking	Company:
Address: 12008 Balls Ford Rd Manassas, VA	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1/20/2017	Date: 1/20/2017
Time: 0930	Time: 1300
Name: Alan Lacey	Name: MaryLaurel Castle
Comp/Agency: VADEQ Pollution Prevention	Comp/Agency: Health District
Notes: Telephone then OnScene	Notes: Telephone Conversation
Date: 1/20/2017	Date: 1/20/2017
Time: 1000	Time: 1000
Name: Nicholas Colatosti	Name: Zak Rabei
Comp/Agency: Property Code	Comp/Agency: VADEQ Solid Wasted
Notes: HM501 Notification	Notes: On Scene
Date: 1/20/2017	Date: 1/20/2017
Time: 1000	Time: 1000
Name: McMannus	Name: Tom Smith
Comp/Agency: VAEOC	Comp/Agency: PWC Solid Waste
Notes: HM501 Notification	Notes: Telephone Notification
Date: 1/20/2017	Date: 1/20/2017
Time: 1200	Time:
Name: Charlie Fitzsimmons - Email	Name:
Comp/Agency: USEPA	Comp/Agency:
Notes: HM501 Notification	Notes: HM501 Notification
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments: Intially consulted over the phone with HM Specialist Snitwongse who was staffing E525. HMO501 requested Specialist Snitwongse to initiate the HM Report and provided a HAZMAT overview of the situation. Based on Specialist Snitwongse's report and pictures from the scene. Assistant Chief McClintock requested HMO501 respond to the location to coordinate notifications and agency response. Consulted with FMO, DEQ and County Property Code Enforcment. The activity at this site appears to the HMO to be a landfill operation, however there are concerns that some of the activitly may actually be permitted. DEQ, FMO and Property Code will consult regulations and legal authorities in regards to the process that is ongoing. FMO will not be providing a summons or NOV. DEQ is the lead agency.


PRINCE WILLIAM
COUNTY


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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170002090	Date: 1/20/2017
Location:12008 Balls Ford Rd Manassas, VA	Time: 6:05
Report Completed By: Matt Adkins, Technician II Snitwongse	Incident Commander: BC504 Chief McCabe
HM 506 Personnel Responding: n/a HS 516 Personnel Responding: n/a Other HMT Personnel Responding: Technician II Snitwongse, HMO501 Matt Adkins, TII Nichol (BST504) BC McCabe	

INCIDENT DESCRIPTION
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RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Barrett Trucking	Company:
Address: 12008 Balls Ford Rd Manassas, VA	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1/20/2017	Date: 1/20/2017
Time: 0930	Time: 1300
Name: Alan Lacey	Name: MaryLaurel Castle
Comp/Agency: VADEQ Pollution Prevention	Comp/Agency: Health District
Notes: Telephone then OnScene	Notes: Telephone Conversation
Date: 1/20/2017	Date: 1/20/2017
Time: 1000	Time: 1000
Name: Nicholas Colatosti	Name: Zak Rabei
Comp/Agency: Property Code	Comp/Agency: VADEQ Solid Wasted
Notes: HM501 Notification	Notes: On Scene
Date: 1/20/2017	Date: 1/20/2017
Time: 1000	Time: 1000
Name: McMannus	Name: Tom Smith
Comp/Agency: VAEOC	Comp/Agency: PWC Solid Waste
Notes: HM501 Notification	Notes: Telephone Notification
Date: 1/20/2017	Date: 1/20/2017
Time: 1200	Time:
Name: Charlie Fitzsimmons - Email	Name:
Comp/Agency: USEPA	Comp/Agency:
Notes: HM501 Notification	Notes: HM501 Notification
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments: Intially consulted over the phone with HM Specialist Snitwongse who was staffing E525. HMO501 requested Specialist Snitwongse to initiate the HM Report and provided a HAZMAT overview of the situation. Based on Specialist Snitwongse's report and pictures from the scene. Assistant Chief McClintock requested HMO501 respond to the location to coordinate notifications and agency response. Consulted with FMO, DEQ and County Property Code Enforcment. The activity at this site appears to the HMO to be a landfill operation, however there are concerns that some of the activitly may actually be permitted. DEQ, FMO and Property Code will consult regulations and legal authorities in regards to the process that is ongoing. FMO will not be providing a summons or NOV. DEQ is the lead agency.


PRINCE WILLIAM
COUNTY


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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170002620	Date: 1/25/2017
Location:Cherry Hill Rd @ Railroad Crossing	Time: 10:04
Report Completed By: Schwab	Incident Commander: Labass
HM 506 Personnel Responding: Schwab, Abel, Cone, Lienau HS 516 Personnel Responding: Samuels, Schultz, Raniszewski Other HMT Personnel Responding: Adkins	

INCIDENT DESCRIPTION
HM506 was dispatched along with HS516 and HMO501 to a vehicle struck by a train. E523 arrived on scene with a tanker truck that was struck by a train. The truck was carrying used oil and the front of the truck was mainly involved. HM506 arrived on scene to find the truck still partially on the tracks and spoke with Command. Most of the fluids from the engine, transmission and hydraulic system had leaked out on to the ground prior to our arrival. The only active leak, was a small amount of grease coming from the suction hoses used to retrieve the used oil. There was minimal damage done to the locomotive of the train. The driver was transported prior to our arrival but the paperwork showed he had picked up approximately 320 gallons of used oil that morning. After discussing with command and HM501, it was decided that there was no need to take any defense or offensive measures. HM506 agreed to stay on scene until representatives from CSX arrived along with the wrecker company. Once they arrived, HM506 stood by while they moved the truck off the tracks in case any leaks began. When the wrecker company began to move the truck two pin hole leaks were noticed coming from the saddle tank. Operations were put on hold while CSX's response team tried to plug the leaks. HM506 provided them with putty and a 66-gallon pop up pool. Mitigation efforts were unsuccessful and the CSX representative made the decision to get the truck off the tracks so trains could operate. The truck was moved away from the tracks and the pop up pool left in place until the fuel could be off loaded by the wrecker company. The truck was stabilized and scene turned over to CSX.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name: Joe Taylor
Company: Safety Kleen	Company: CSX
Address: 11520 Balls Ford Road	Address:
Phone#: 703-331-0516	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1-25-2017	Date:
Time: 2104	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS

Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


SAFETY-KLEEN
SYSTEMS, INC.
MANASSAS, VA
(703) 331-0516
USDOT 151288
GVW 56,540


AMTRAK


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GVW 56,540


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SYSTEMS, INC.
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GVW 56,540


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AMTRAK


195
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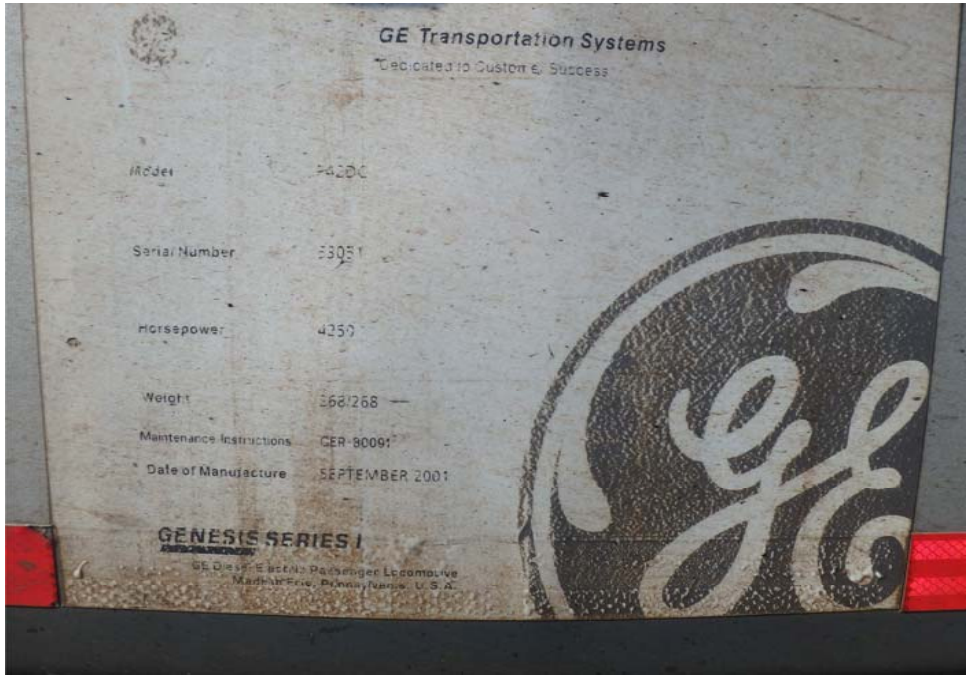
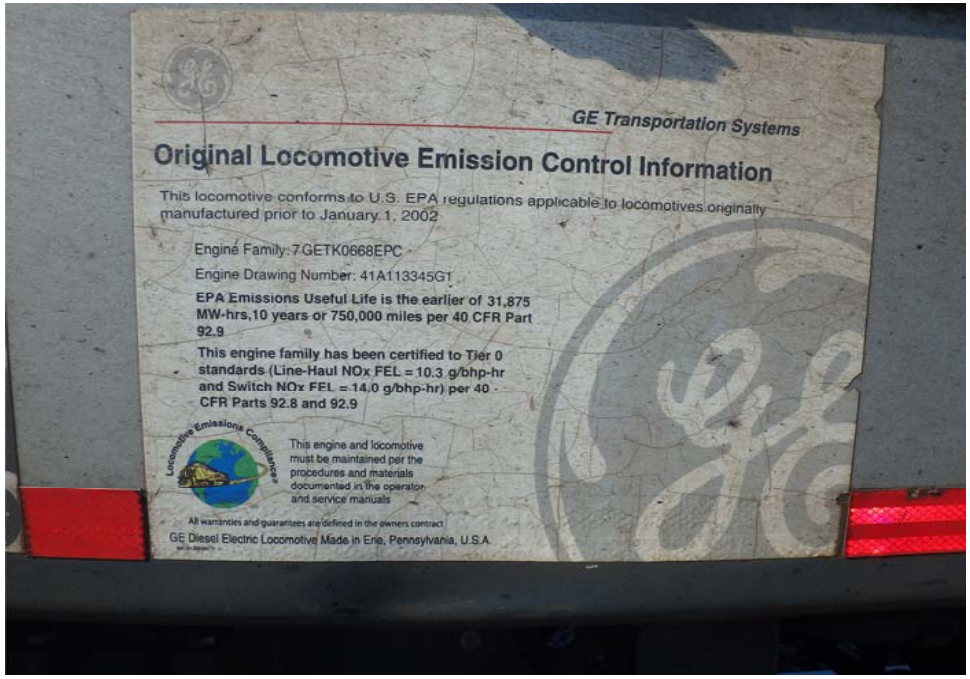

GE Transportation Systems
Dedicated to Customer Success
Model P42DC
Serial Number 53051
Horsepower 4250
Weight 268/268
Maintenance Instructions CER-8009
Date of Manufacture SEPTEMBER 2001
GENESIS SERIES I
GE Diesel Electric Passenger Locomotive
Made in Erie, Pennsylvania, U.S.A.


WARNING
PETROLEUM
PIPELINE


GE Transportation Systems
Original Locomotive Emission Control Information
This locomotive conforms to U.S. EPA regulations applicable to locomotives originally manufactured prior to January 1, 2002
Engine Family: 7GETK0668EPC
Engine Drawing Number: 41A113345G1
EPA Emissions Useful Life is the earlier of 31,875 MW-hrs,10 years or 750,000 miles per 40 CFR Part 92.9
This engine family has been certified to Tier 0 standards (Line-Haul NOx FEL = 10.3 g/bhp-hr and Switch NOx FEL = 14.0 g/bhp-hr) per 40 CFR Parts 92.8 and 92.9
Locomotive Emissions Compliance
This engine and locomotive must be maintained per the procedures and materials documented in the operator and service manuals
All warranties and guarantees are defined in the owners contract
GE Diesel Electric Locomotive Made in Erie, Pennsylvania, U.S.A.


APPORTIONED
P596857
ILLINOIS


Maryland
Department of
the Environment
CONTROLLED
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HAULER
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VEHICLE
CERTIFICATION
Valid Through
05-2014


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www.safety-kleen.com
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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170002620	Date: 1/25/2017
Location:Cherry Hill Rd @ Railroad Crossing	Time: 10:04
Report Completed By: Schwab	Incident Commander: Battalion 503 - LaBass
HM 506 Personnel Responding: Schwab, Abel, Cone, Lienau HS 516 Personnel Responding: Samuels, Schultz, Raniszewski Other HMT Personnel Responding: HMO501 - Adkins	

INCIDENT DESCRIPTION
HM506 was dispatched along with HS516 and HMO501 to a vehicle struck by a train. E523 arrived on scene with a tanker truck that was struck by a train. The truck was carrying used oil and the front of the truck was mainly involved. HM506 arrived on scene to find the truck still partially on the tracks and spoke with Command. Most of the fluids from the engine, transmission and hydraulic system had leaked out on to the ground prior to our arrival. The only active leak, was a small amount of grease coming from the suction hoses used to retrieve the used oil. There was minimal damage done to the locomotive of the train. The driver was transported prior to our arrival but the paperwork showed he had picked up approximately 320 gallons of used oil that morning. After discussing with command and HM501, it was decided that there was no need to take any defense or offensive measures. HM506 agreed to stay on scene until representatives from CSX arrived along with the wrecker company. Once they arrived, HM506 stood by while they moved the truck off the tracks in case any leaks began. When the wrecker company began to move the truck two pin hole leaks were noticed coming from the saddle tank. Operations were put on hold while CSX's response team tried to plug the leaks. HM506 provided them with putty and a 66-gallon pop up pool. Mitigation efforts were unsuccessful and the CSX representative made the decision to get the truck off the tracks so trains could operate. The truck was moved away from the tracks and the pop up pool left in place until the fuel could be off loaded by the wrecker company. The truck was stabilized and scene turned over to CSX.

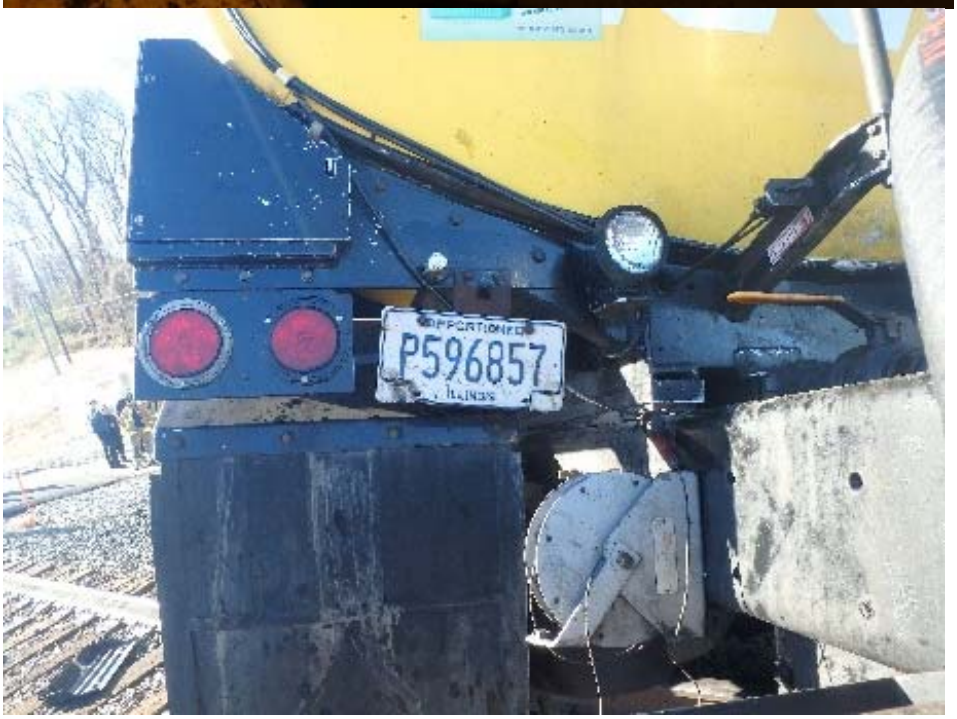
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name: Joe Taylor
Company: Safety Kleen	Company: CSX/HAZMAT
Address: 11520 Balls Ford Road	Address: Pittsburg PA
Phone#: 703-331-0516	Phone#: 757-710-4650
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1-25-2017	Date: 1-25-2017
Time: 2104	Time: 1300
Name: Chris	Name: Alan Lacy
Comp/Agency: VAEOC	Comp/Agency: DEQ Northern VA Office
Notes:	Notes: Called HM501 for an update

NOTIFICATIONS/CONTACTS	
Date: 01/25/2016	Date:
Time: 11:00 approx	Time:
Name: Kevin Dauphin	Name:
Comp/Agency: Amtrak Police	Comp/Agency:
Notes: Requested Report	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: Units On Scene: Medic 523, Ambulance 510, Truck 523, Engine 523, Rescue 510, Safety 503, Truck 513, Safety 502, Rescue 501, HAZMAT 506, HAZMAT Support 516, HAZMAT Officer 501, Battalion Chief 502, Operations 500 (Assistant Chief) (15 Units Total)
HAZMAT Officer Comments:


Maryland
Department of
the Environment
CONTROLLED
HAZARDOUS SUBSTANCES
HAULER
035093
VEHICLE
CERTIFICATION
Valid Through
05-2014


APPORTIONED
P596857
ILLINOIS


WARNING
PETROLEUM
PIPELINE


SAFETY-KLEEN
SYSTEMS, INC.
MANASSAS, VA
(703) 331-0516
USDOT 151288
GVW 56,540


AMTRAK

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170002650	Date: 1/25/2017
Location:9220 MikeGarcia Dr	Time: 15:27
Report Completed By: Schwab	Incident Commander: Luckenbill
HM 506 Personnel Responding: Schwab, Abel, Cone, Lienau HS 516 Personnel Responding: Samuels, Schultz, Raniszewski Other HMT Personnel Responding: Adkins	

INCIDENT DESCRIPTION
HM506 was dispatched along with HS516 and HMO501 to a smell of gasoline inside a structure. The comments stated that gasoline was actively leaking into the storm drains. E525 arrived on scene and found a smell of gasoline inside 9220 and had CO readings of 25ppm in 9228, which was the business next door. The workers in 9220 were cleaning automotive parts with brake cleaner and some gasoline spilled on the ground. HM506 arrived on scene and spoke with command. After talking to command we spoke with the workers in 9220, due to a language barrier it was hard to understand what happened. Beside the smell there was only a small area of water that had a sheen on it. Nothing had made it into drainage system or any waterways. We investigated 9228 and the source of the CO, it was originally thought that a propane heater was the source. After entering the structure and speaking with the occupants it was found that the vehicles were running inside the building causing the elevated levels. No active hazards were noted and we advised command to ventilate the structures. Scene turned back over to E525.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1-25-2017	Date:
Time: 2104	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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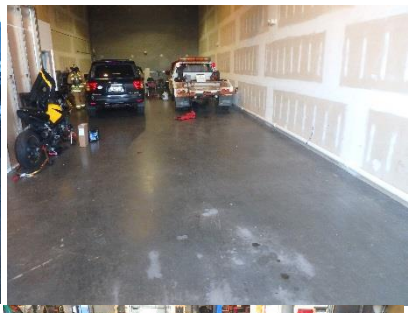
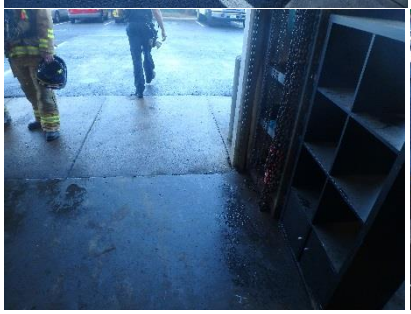
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:




PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170003885	Date: 2/6/2017
Location:13770 Smoketown RD	Time: 10:15
Report Completed By: Lt. Anthony	Incident Commander: Catain Scott
HM 506 Personnel Responding: Lt. Anthony. Tech I C. Malone HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION
E520 was originally dispatched to a smoke investigation at above address. Original comments from dispatch were "Above location is remodeling//UNK smell of fumes//Not Gas//Coming from inside. E520 upgraded to a Hazmat when they encountered a strong smell of chemicals coming from inside. E506 was placed OOS and HS506 responded. While responding, the dispatched address was evacuated, crews monitored the dispatched address, B-1 exposure, and D-1 exposure with 4-gas detectors. All 4-gas readings were normal. No odor was present in the B-1 exposure however a strong odor was present in the D-1 exposure and the dispatched address. After reporting to command, HS506 was told that D-1 exposure had the concrete floor resealed yesterday. D-1 is only seperated by a tarp so all the fumes or contaminating the dispatched address. We were asked to monitor both locations. At this point T511 has has been ventilating both structures. Initialy we received a reading of 436ppb on our PID in the D-1 exposure. D-1 exposure is part of the same address but separated by a plastic tarp (see pictures). We ran into the property manager outside D-1 on side Delta. He showed us the concrete sealer and explained that two five gallon buckets of sealer were only partially used and left uncovered all night and morning. He sealed them and moved them away from the open door. After ten minutes the readings decreased to a range of 200 to 270ppb. Highest reading in The Thrift Store was 163ppb in the Charlie and Delta quadrants. We advised command of our findings and was placed in service. E520 and T511 remained on scene for ventilation.

RESPONSIBLE PARTY	OTHER PARTY
Name: George Washington Wachter	Name:
Company: The Village Thrift Store	Company:
Address: 13770 Smoketown Rd	Address:
Phone#: 703-897-0126, 215-341-6583 (C)	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS

Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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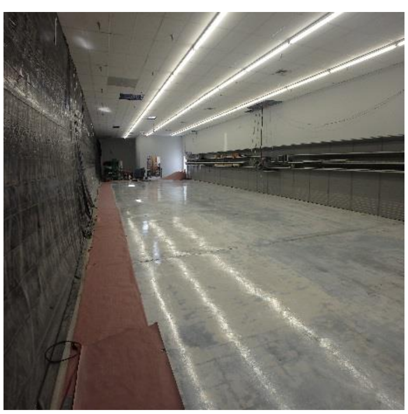
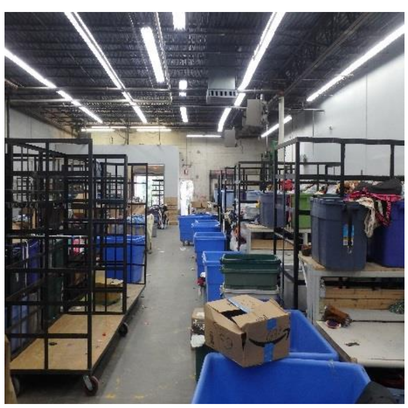
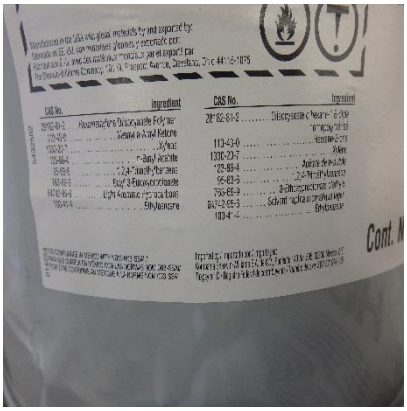
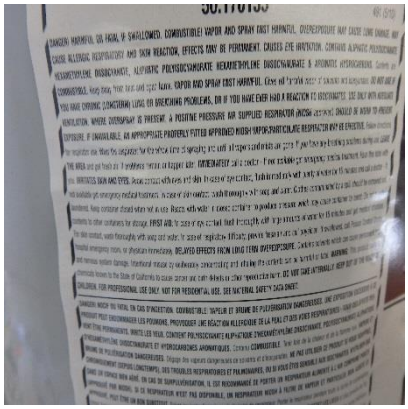
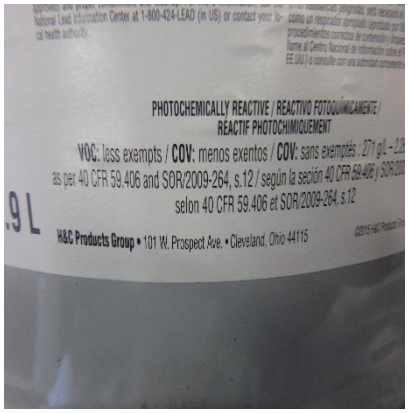
Additional Notes/Information:
HAZMAT Officer Comments:




PHOTOCHEMICALLY REACTIVE / REACTIVO FOTOQUÍMICAMENTE / REACTIF PHOTOCHIMIQUEMENT
VOC: less exempts / COV: menos exentos / COV: sans exemptés
as per 40 CFR 59.406 and SOR/2009-264, s.12 / según la sección 40 CFR 59.406 / SOR
selon 40 CFR 59.406 et SOR/2009-264, s.12
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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170004402	Date: 2/10/2017
Location:14315 Ferndale Rd.	Time: 1932
Report Completed By: T-II Hoffman	Incident Commander: BC 505 Green
HM 506 Personnel Responding: Lt. Shannon, T-II Weaver, T-I Podobed, T-I Santiago, T-II Snitwongse HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Station 6 received a request for a phone consult from the UFRO. BC505 requested a phone consult in reference to petroleum products being leaked from a boat after a fire. T-II Weaver called BC505 and was advised of the situation. BC505 advised T-II Weaver that there was 25-35 gallons of gas and oil leaking from a garage after a fire. T-II Weaver asked if the leak was contained and BC 505 said that it was contained to the yard and some had ran into the neighbors yard. BC 505 advised that there were no water ways or storm water drains involved. T-II Weaver advised him to give the responsible party, the home owner, a copy of the LEPC form. BC 505 questioned where the form was and he was advised that the form was on all engines. BC 505 questioned if the clean up company would come out tonight and he was told maybe. The phone call was ended, Capt. McCleese and Lt. Shannon were aware of situation. Lt. Shannon called VA EOC to provide a courtesy notifictaion.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/10/17	Date:
Time: 2041	Time:
Name: Archer Stark	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170004894	Date: 2/15/2017
Location:13707 Jefferson Davis HWY	Time: 12:40
Report Completed By: Lt Jones	Incident Commander: E502B (Reese)
HM 506 Personnel Responding: Jones, Cook HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Phone Consult from E502B through UFRO. E502B requested phone consult to notify HazMat that they were on the scene of a 1" gas line that was leaking. They did not need a HazMat response or any information, they only wanted to notify HazMat. Gas company already notified and in route. No notifications made by HazMat.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Time:	Time:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD17004961	Date: 2/15/2017
Location:2700 Potomac Millis Cir, Woodbridge 22192	Time: 16:49
Report Completed By: Lt. N. Baskerville	Incident Commander: Capt. M. Forbes
HM 506 Personnel Responding: N/A HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Lt. Baskerville did a phone consult with Capt. Forbes of E520B. About 16 gals leaked out of a vehicle at a gas station. The gas station attendant already used a spill clean up kit for the spill. The leak was no longer active and was contained to one area. Capt. Forbes called to verify the correct procedure. Lt. Baskerville stated to provide the responsible party with an LEPC form and to let her know that the towing company coming for the car should be able to handle the clean up.

RESPONSIBLE PARTY	OTHER PARTY
Name: Aquanetter Fields	Name:
Company:	Company:
Address:	Address:
Phone#: 703-927-4903	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/15/2017	Date:
Time: 17:28	Time:
Name: Archer Stark	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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NOTIFICATIONS/CONTACTS	
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Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170005560	Date: 2/21/2017
Location:7412 Stream Walk Ln. Manassas, Va. 20109	Time: 11:13
Report Completed By: TII Matthew Schultz	Incident Commander: No command established
HM 506 Personnel Responding: Lt. Michael Anthony, TII Blake Abel, TI Austin Davis HS 516 Personnel Responding: TII Matthew Schultz, TI Joseph Cramer, TI Andrew Silvernale, TI Matthew Strickland, TI Louis Raniszewski Other HMT Personnel Responding: Matt Adkins	

INCIDENT DESCRIPTION
11:13 - Units were dispatched to a HAZMAT in a retention pond at the corner of Miramar Drive and Balls Ford Road, in the H.H. Gregg parking lot. Earlier in the day, a representative of DEQ had received notification from a concerned citizen that there was a sheen on the surface of the water, and that there had been a gasoline-like smell in the area for approximately the past month. DEQ notified Matt Adkins, who generated a HAZMAT response. 11:45 - Crews began to take readings with Q-Rae II 4-gas monitors around the area of the retention pond. Readings on the meters did not change from normal (CO: 0ppm, 02: 20.9%, H2S: 0ppm, LEL: 0%). Crew members were able to determine where the storm-drain systems were that fed in and out of the retention pond using GIS. Crews then split up and checked the man-hole covers and storm drains leading into and out of the pond using 4-gas monitors. There was no change in the readings, and there was no visible evidence of the contaminated water in the storm drains. Mr. Adkins stated that there was a clean-up contractor en route to the scene. 12:39 - Units began to be released from the incident. 15:01 - VA EOC notified. Mr. Powers of CNS Environmental will be flying in this evening from NY to oversee cleanup. Clean Harbors, Inc. will be the environmental contractor. They will start work first thing in the morning. HMO's will do a followup site visit tomorrow at the request of DEQ. Colonial Pipeline also sent a representative to the site to insure it was not their pipeline

RESPONSIBLE PARTY	OTHER PARTY
Name: N/A	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/21/2017	Date: 2/21/2017
Time: 15:01	Time: Unknown
Name: Delma	Name: John Dowling
Comp/Agency: VA EOC	Comp/Agency: Acadia Realty (owner, property mgmt.)
Notes: Courtesy Notification	Notes: Contacted by Matt Adkins

NOTIFICATIONS/CONTACTS	
Date: 2/21/2017	Date: 2/21/2017
Time: 09:44	Time: Unknown
Name: Alan Lacy	Name: Charlie Powers
Comp/Agency: DEQ	Comp/Agency: CNS Environmental
Notes: Contacted by Matt Adkins	Notes: Contacted by Matt Adkins
Date: 2/21/2017	Date:
Time: Unknown	Time:
Name: Paul Jolley	Name:
Comp/Agency: Colonial Pipeline	Comp/Agency:
Notes: Contacted by Matt Adkins	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
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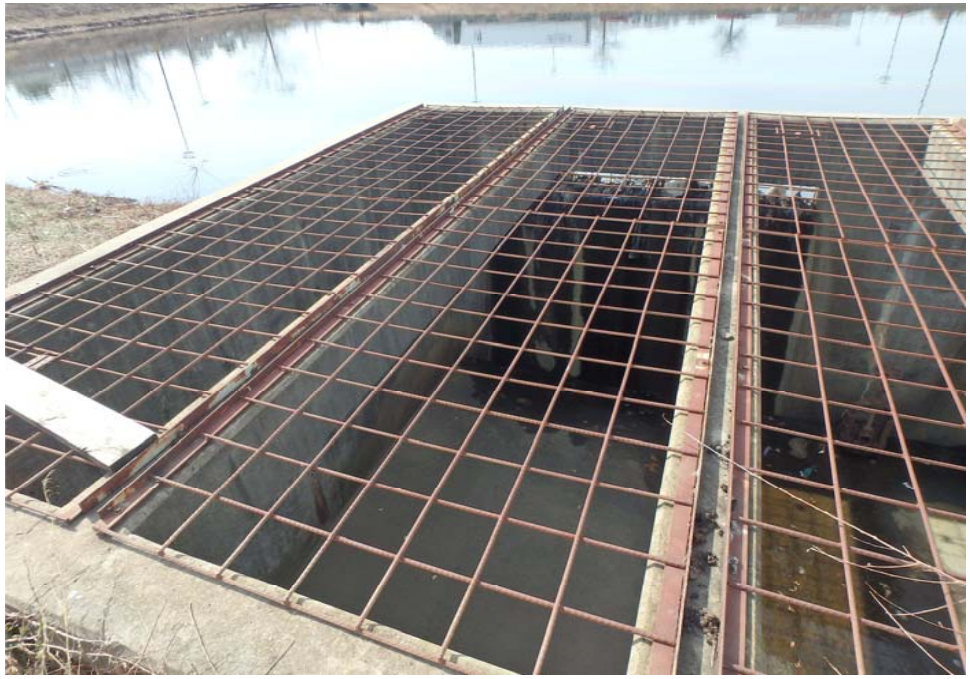
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170005591	Date: 2/21/2017
Location:13209 Alison Street	Time: 14:42
Report Completed By: HMO502, Captain Stewart	Incident Commander: n/a
HM 506 Personnel Responding: n/a HS 516 Personnel Responding: n/a Other HMT Personnel Responding: n/a	

INCIDENT DESCRIPTION
E502 was dispatched for an Investigation at the address earlier in the day. Dispatch comments stated that there was a barrel in the backyard containing a liquid substance that had been left by the previous homeowner. When E502 arrived the current homeowner was not home so E502 went in service. HMO502 was in the area later in the day and drove by the residence. The homeowner was home and said he would like assistance. HMO502 contacted PSCC and asked to be placed on the call. Homeowner confirmed that the barrel was left by previous homeowner, was sealed, was not leaking, and had been in same place for about 6 months. HMO502 gathered meters and proceeded with the homeowner to the fenced in backyard. The PID, 4 gas monitor, and Multirae Pro had normal readings approaching the 50 gallon plastic barrel, normal readings on top of the barel near the bungs, and normal readings at the base of the barrel. The barrel was not leaking and was sealed and appeared to contain approximately 15-20 gallons of an unknown liquid. The homeowner was advised that in its current state the product posed no threats and that since it was on his property he owned the barrel and its contents. He asked what he should do with it. He was advised to contact the landfill and speak to someone in the household hazardous waste program regarding disposal and to call HMO502 if he continues to have any issues.

RESPONSIBLE PARTY	OTHER PARTY
Name: Jarvin Pena	Name:
Company: PWC Resident	Company:
Address: 13209 Alison Street	Address:
Phone#: 571-239-1792	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/21/17	Date: 2/21/17
Time: 14:44	Time: 16:14
Name: Lt. Anthony	Name: Frederick
Comp/Agency: Duty Hazmat Tech	Comp/Agency: VAEOC
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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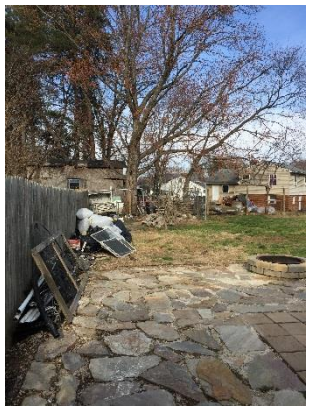
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170006336	Date: 2/27/2017
Location:14300 Veterans Dr. Veterans Park.	Time: 16:35
Report Completed By: Lt. Anthony	Incident Commander: Lt. Klahr
HM 506 Personnel Responding: Lt. Anthony. HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION
A park ranger working at Veterans Park in Woodbridge noticed a sheen on the water in Marumsco Creek. He called 911. E512 was dispatched to 14300 Veterans Dr. They were met by Park Ranger Hancock who escorted the Engine down a service road where there was a one lane bridge. From the bridge, E512 did see an area of water with a thin sheen on it. Lt. Klahr asked for a phone consult. E512 was able to report that there was no odor present, all readings from the 4-gas were normal, and there were no visible signs of an active leak. Due to the thin sheen and no immediate life safety, we decided that there was no need for a hazmat response. The Coast Guard has all the information. They will first decide if it is EPA's or their jurisdiction. Either agency will send people to the dispatched location to take samples and try to locate the source.

RESPONSIBLE PARTY	OTHER PARTY
Name: Under Investigation By Coast Guard	Name: Park Ranger Hancock
Company:	Company: PWC Department of Parks and Recreation
Address:	Address: 14300 Veterans Dr. Veterans Park.
Phone#:	Phone#: (571) 238-0612
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 02/27/2017	Date: 02/27/2017
Time: 1755	Time: 1830
Name: Chris Blake	Name: Hector Fuentes
Comp/Agency: VA EOC	Comp/Agency: National Response Center
Notes:	Notes: They would contact the Coast Guard.
Date: 02/27/2017	Date:
Time: 1910	Time:
Name: Petty Officer Lucas Damats	Name:
Comp/Agency: Coast Guard out of Baltimore	Comp/Agency:
Notes: See Description.	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170006808	Date: 3/3/2017
Location:2951 Fox Lair Dr Apt 201 Woodbridge, VA	Time: 17:22
Report Completed By: Greiner	Incident Commander:
HM 506 Personnel Responding: Greiner, Favole, Sawyer HS 516 Personnel Responding: N/A Other HMT Personnel Responding: HMO501 Adkins - Phone Consultation	

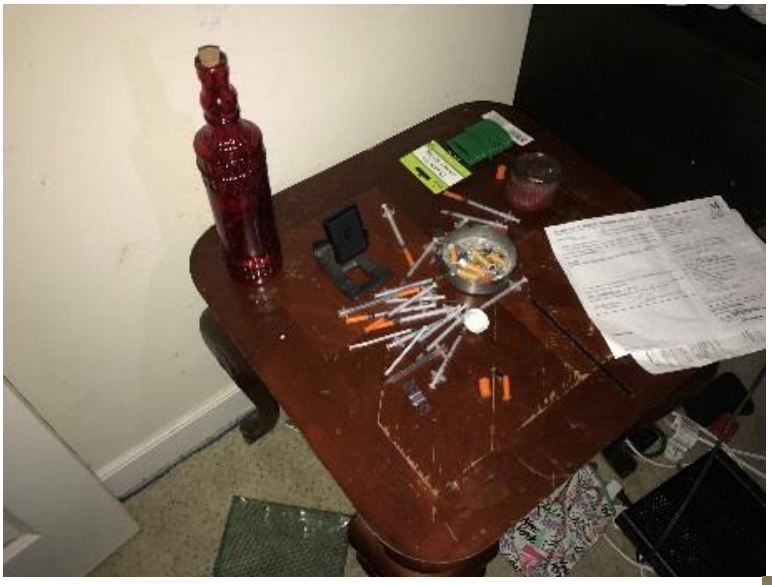
INCIDENT DESCRIPTION
Station 6 received a phone consults from PWCPD through the UFRO in regards to a hazmat incident that took place on March 1,2017. Hazmat Technicians were told that the physical meth lab had already been removed by Prince William Police Department. The residents at the location of the previous hazmat learned today that the person that had been arrested was making meth in his apartment. Residents began to complain about illnesses and were concerned their air quality was not safe to live in. Hazmat 506 and E523 went to the building complex where the initial incident took place to investigate and monitor. E523 and Hazmat 506 spoke with the residents that lived below the apartment and next to the apartment that was producing meth to understand their complaints and what they were smelling. Hazmat 506 used the PID, MultiRae Pro and the 4 gas to monitor the apartments surrounding as well as the apartment that originally had the meth lab in it. All readings were found to be normal in all apartments. It was explained to all residents, as well as the property manager who was on site that our monitors showed normal readings and to the best of our knowledge was safe to be in the apartment. We spoke to the property manager about having the apartment cleaned and then turned the scene over to PD.

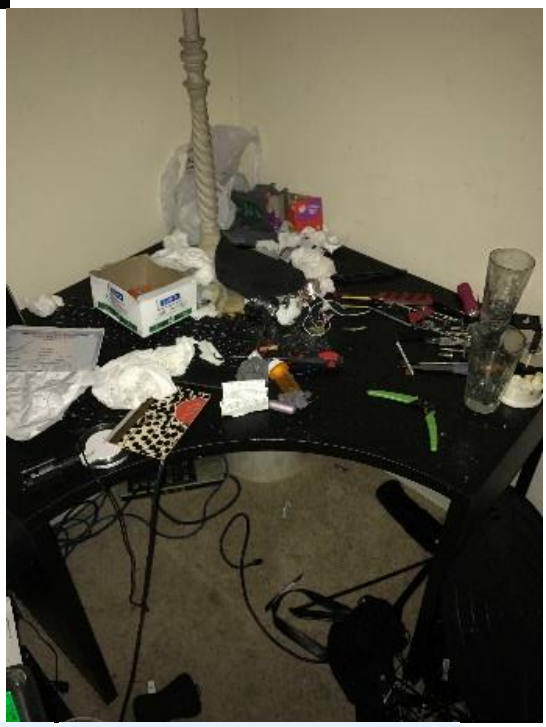
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name: Detective McMillan
Company:	Company: PWC Police / Narcotics Division
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 3/3/2017	Date:
Time: 20:25	Time:
Name: Chris Blake	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments: Copy of report provided to MaryLaurel Castle, at PW Health District via email.





PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170007714	Date: 3/11/2017
Location:6950 NoVA Way, Manassas VA 20109 (La Quinta)	Time: 17:47
Report Completed By: Technician II Blake Abel	Incident Commander: BC501 Christopher Kelly
HM 506 Personnel Responding: Tech II Abel, Tech II Budkiewicz, Tech I Malone, Tech I Gibson HS 516 Personnel Responding: Lt. Samuels, Tech II Clark, Tech II Schultz, Tech I Silvernale Other HMT Personnel Responding: Cpt. Stewart	

INCIDENT DESCRIPTION
HAZMAT responded to the dispatched address at the request of BC582. Units were on scene of an ALS injury, which BC582 determined to be the result of a potential hazardous materials exposure. The location of the call was the La Quinta Inn & Suites, a 3 story commercial structure. BC582 notified us that there were 7 patients complaining of burning skin, respiratory distress, and chest pain, all of whom had recently spent approximately 30 minutes in the hotel pool and hot tub. BC582 transferred command to BC501 during our response to the call. Duty HAZMAT Tech - Tech II Abel communicated that all patients should undergo emergency decon prior to our arrival, and not to delay transport. As HAZMAT units arrived on scene, 6 patients were being prepared for transport, and 1 patient signed for refusal of further care. HAZMAT Group developed a plan to make entry into the facility, take samples, and conduct atmospheric monitoring. Tech II Abel and Tech I Malone were the initial entry team, while Tech II Clark and Tech II Shultz were the backup team. During our investigation we did not note any abnormal readings on our monitors. pH of the hot tub and pool revealed a pH of 8. We investigated the pump room and did not observe any signs of a product leak or foul play. The pump room was locked when we arrived, and hotel staff provided us with the key. We noted the presence of several chemicals stored in the pump room, but nothing appeared suspicious or out of place for the scene. Based on our research of the chemicals we determined that the most likely source of the patient's symptoms was the Sodium Hypochlorite tablets, as exposure to the substance is associated with similar effects. The names of all chemicals were given to FM518 to assist with their investigation. A sample of the water from the hot tub was placed on the HAZMAT ID 360, which indicated that the solution was mostly water. We determined that no immediate life threat was present, and that no further fire department action was necessary.

RESPONSIBLE PARTY	OTHER PARTY
Name: Masih Alemi	Name:
Company: La Quinta Inn & Suites	Company:
Address: 6950 NoVA Way, Manassas VA 20109	Address:
Phone#: 703-393-9966	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS			
Date:	3/11/17	Date:	3/11/17
Time:	21:45	Time:	21:55
Name:	Archer Stark	Name:	Patrick Jones
Comp/Agency:	VAEOC	Comp/Agency:	PWC Dept. of Health
Notes:		Notes:	Unable to make direct contact, left a message.

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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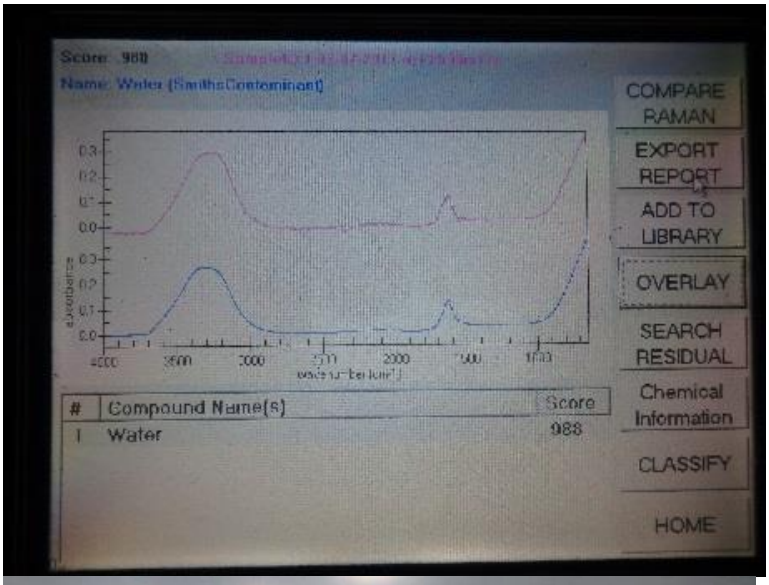
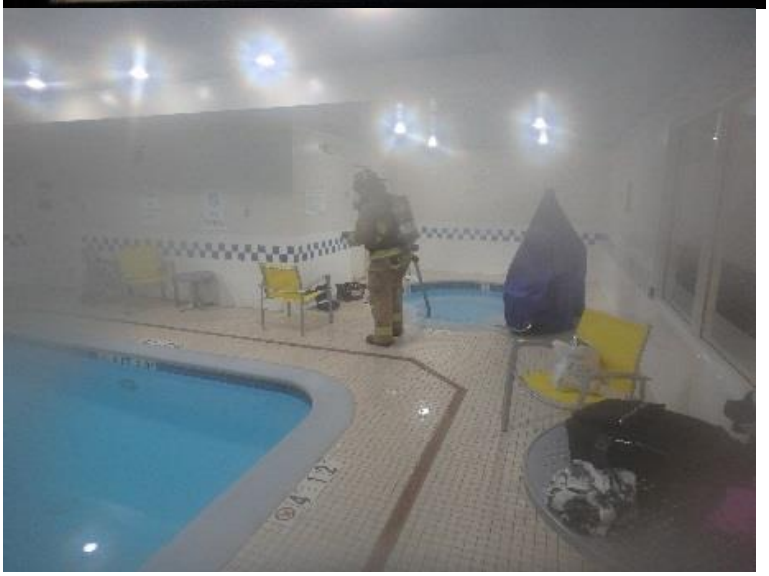
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments: Dr. Allison Ansher, Director of PW Health District requested further information from HMO501 M. Adkins. Draft Report and Dispatch Information transmitted. Health District will be doing a followup.


Score: 988
Name: Water (SmithsContaminant)
COMPARE RAMAN
EXPORT REPORT
ADD TO LIBRARY
OVERLAY
SEARCH RESIDUAL
Chemical Information
CLASSIFY
HOME
Compound Name(s) Score
1 Water 988




COLAB
17416

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170008752	Date: 3/21/2017
Location:69 W Halyburton St, Quantico VA 22134	Time: 15:09
Report Completed By: Tech II Weaver	Incident Commander: AC Dickey
HM 506 Personnel Responding: Tech II Weaver, Tech II Hoffman, Tech I Waln, Tech II Snitwongse HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Duty HAZMAT Technician was called by communications for a phone consult for Quantico. Tech II Weaver called AC Dickey and was told that Quantico was onscene of a suspected Mercury leak. Quantico didn't have anything to test to make sure that it was Mercury. HM506 went enroute to the call. Once on scene, Quantico has a small sample in a small jar for HM506 to test. HM506 tested small sample with Mercury indicator and confirmed that it was Mercury. Quantico had a clean up contrator on scene and scene was turned over to them.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Marine Corp Base Quantico	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 3/21/17	Date:
Time: 1811	Time:
Name: Archer	Name:
Comp/Agency: Virginia EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170009320	Date: 3/26/2017
Location:17041 Jeff. Davis Hwy.	Time: 11:57
Report Completed By: Lt. Anthony	Incident Commander: NA
HM 506 Personnel Responding: Lt. Anthony, Tech II O'Donnell, Tech I Malone, Tech I Davis. HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION
T523 dispatched for a tractor trailor leaking fuel in a Walmart parking lot. They found a truck (no trailer) parked in the middle of the lot, leaking fuel from one of the saddle tanks. The driver of the truck unscrewed the plug to the saddle tank to see how much fuel was in it. He then managed to accidentally drop the plug into the saddle tank. T523 had dammed the area and the driver was activly collecting the leaking fuel with a plastic container. HM506 was added to the call after a phone consult. While in route, the driver of the truck managed to stop the leak using a wooden dowel and putty. The driver of the truck was given a current LEPC. The driver called Atlas to clean up the spill. Manager of Walmart on site and appraised of situation. Approximately 5 gallons spilled on pavement. Spill contained, and leak stopped. VA EOC notified.

RESPONSIBLE PARTY	OTHER PARTY
Name: Quincy Fields	Name: Mathew Cryer-Mgr.
Company: Joe Moholland Moving	Company: Walmart
Address: Fenton, MO	Address: 17041 Jeff. Davis Hwy.
Phone#: cell-703-231-7331	Phone#: 703-221-4116
Notes: office-703-494-2021	Notes: Spill in parking lot.

NOTIFICATIONS/CONTACTS	
Date: 03/26/2017	Date: 03/26/2017
Time: 14:52	Time: 1248
Name: First Sargent Fredrick	Name: Atlas
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


JOE MOHOLLAND MOVING
Operated By
Mayflower Transit
Fenton, MO
USDOT # 125563

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170009720	Date: 3/30/2017
Location:3421 Commission Ct.	Time: 0814
Report Completed By: Shannon	Incident Commander: BC502
HM 506 Personnel Responding: Shannon, Hoffman, Greiner, Podobed, Sawyer HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Broken hose resulted in the release of Nitrous gas at a dentist office. E514 made entry with a 4 gas monitor and closed the valve to the tank that was leaking. They reported normal readings on their 4 gas monitor. With no change in the atmosphere there was no need to continue the Hazmat response.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 3/30/2017	Date:
Time: 0947	Time:
Name: Chris Frederick	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170010097	Date: 4/2/2017
Location:1900 Opitz Blvd	Time: 15:28
Report Completed By: Lt. Shannon	Incident Commander: Tech II Tolly
HM 506 Personnel Responding: Shannon, Weaver, Hoffman, Harvey HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Hazmat phone consult for a cleaning person that mixed toliet bowl cleaner and bleach while cleanig a toliet. The person inhaled that off gas from the mixture. Tech II Tolly from M520 called becaues he wanted to know what the PT had inhaled. He provided me with the name of both chemicals and I advised that I would call him back after doing some research. I called him back to advise him that when mixed the two chemicals can release chlorine gas. I advised them to contact medical control for futher treatment. They also advised me that E510 had already taken care of all hazards and the building was evacuated and venitilated.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/2/2017	Date:
Time: 22:05	Time:
Name: Chris Blake	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170010498	Date: 4/6/2017
Location:Dumfries Rd/ Independent Hill Dr	Time: 11:01
Report Completed By: Lt Jones	Incident Commander: Lt Jones
HM 506 Personnel Responding: Lt Jones, Technician Bell, Technician Cook HS 516 Personnel Responding: Other HMT Personnel Responding: Technician Saxon on A506	

INCIDENT DESCRIPTION

Incident # 170010498. Dispatched for auto accident with a tractor trailer off the road northbound 234 at Independent Hill Dr. Arrived on scene to find 1 tractor trailer off the road, jack-knifed at the dispatched location. Truck ran over street information sign and came to a stop just short of the stop light pole. Truck driver was not injured and was able to get out of the truck through the window. The passenger side saddle tank was ruptured with fuel pouring out consistently at a decent flow. The fuel was pouring into a ditch along side of 234 and running into a storm drain just south of the intersection. E506 Bucket FF was directed to immediately start construction of dam to retain as much of the fuel as possible. Fuel was already flowing constantly into the storm drain upon our arrival. While bucket FF began defense operations, E506 officer questioned driver about amount of fuel in tank. Driver stated the tanks were only half full. E506 requested the HAZMAT unit for equipment. E506 kept A506 on scene for personnel to help with defense ops. With the heavy rain at the time, the fuel with the water was flowing fast towards the drain. E506 officer requested E516 and HS516 for equipment and personnel. Just after requesting 16 units, the flow from the saddle tank stopped due to the tank being emptied to below the hole in the side of the tank. Placed station 16 units in service. E506 crew with A506 crew worked on the dam and were able to place tarps/plastic over the storm drain and cover outside with dirt from the ground near the incident. BC502 arrived on scene to take over command. Lighting strikes near incident forced crews to return to apparatus until lightening passed per BC502. After returning to work, the tow company had already begun to move the truck.

We were able to follow the flow of water pass the storm drain led us to another storm drain farther south down 234 and appeared to flow into a retention pond approx 300' south of the intersection where the accident occurred. Informed VA EOC, VDEM, VDOT and DEQ of situation as well as approx 40 gallons of diesel fuel made it into the retention pond. A manger for the trucking company arrived on scene and stated he would call one of the clean up companies listed on the LEPC form. Manager contacted Atlas Environmental. Slight language barrier when speaking with driver and manager (spanish first language for both). Manager handed E506 officer his phone to speak with Atlas. Unable to hear rep from Atlas using his phone - no volume. E506 officer called Atlas using the HazMat phone to speak with Paul Stoecklin. While on the phone with Atlas, the truck was towed away and the driver of the truck and the manager of the trucking company left the scene without giving us any more information. VDOT stated they would work with PD to get any additional information needed. E506 and HS506 remained on scene until Brad Miller at VDOT took control of scene nad released us.

Heard back from Atlas around 1500 hours. Paul from Atlas stated he was not able to get in contact with the trucking company. He also stated that the address given by manager and the website information he found show this to be a residential office. Paul said he would not do any clean up until they hear from the insurance company of the trucking company. Currently, there is not a set clean up company for the spill. I called Brad Miller at VDOT to update him on this information.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: RG Road Services	Company:
Address: 12715 Carriage Ford Rd Nokesville Va 20186	Address:

Phone#: 571-991-4245	Phone#:
Notes: VDOT - Brad Miller pr PW PD can get additional information if needed	Notes:

NOTIFICATIONS/CONTACTS	
Date: 04/06/2017	Date: 04/06/2017
Time: 11:28	Time: 12:29 pm
Name: McMannis	Name: Bradford Miller
Comp/Agency: VAEOC	Comp/Agency: VDOT
Notes: Courtesy Notification	Notes: Took control of scene - VDOT right of way
Date: 04/06/2017	Date: 04/06/2017
Time: 11:47 am	Time: 12:12
Name: Allan Lacey	Name: Mark Aveni
Comp/Agency: DEQ	Comp/Agency: PWC Public Works
Notes: Stated they would send out rep after the clean up company begins cleaning. Informed him that Atlas was contacted. Also gave him contact information for Brad Miller at VDOT	Notes: Left voice mail - courtesy notification about fuel in the retention pond.
Date: 04/06/2017	Date: 04/06/2017
Time:	Time: 11:36 am
Name: Paul Stoecklin	Name: Willy Brown
Comp/Agency: Atlas Environmental	Comp/Agency: VDEM
Notes: Was contacted as clean up company but not finalized by trucking company.	Notes: Courtesy Notification
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


MAC
MAC
DO NOT PUSH
45FT.
100" SIDES
114 CU. YD.
1044
705-2092


RG
Road Services Inc.
Nokesville, Va.
BX 9171
CF0123
GW 80,000 lb
USDOT 2403585

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170010636	Date: 4/7/2017
Location:Hedges Run Drive/ Aegean Terrace	Time: 13:00
Report Completed By: Technician II Nick Budkiewicz	Incident Commander: Lt Schwab
HM 506 Personnel Responding: Lt Michael Anthony, Technician II Nick Budkiewicz, Technician I Austin Davis HS 516 Personnel Responding: Other HMT Personnel Responding: HMO501 Matt Adkins	

INCIDENT DESCRIPTION
E514 was dispatched for a hazard at Hedges Run Drive and Aegean Terrace. Once on scene they requested a phone consult with the on duty hazmat tech. The on duty tech called E514 officers. E514 officer stated they had a 7-foot black trailer with no markings leaking an unknown fluid from the rear. It was parked along a curb in a cul de sac, not attached to a vehicle. Approximately 1 gallon of product leaked out on to the pavement. E514 officer stated the product traveled approximately 25 feet along the curb where they used absorbent to build a dam to contain the product. No product made it to any waterway. E514 crew discovered the door to the trailer was not locked and was able to gain access to the inside. Once inside they determined the leak was from a can of bar oil that was laying on its side. Container was found completely empty and was 1 gallon was in size. No other product was found to be leaking. E514 turned the scene over to county PD to run the plate found on the trailer to find the responsible party for cleanup. VA EOC was notified, no other notifications needed.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/7/2017	Date:
Time: 13:45	Time:
Name: Thelma	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170010662	Date: 4/7/2017
Location:11450 Huntsman Dr	Time: 17:19
Report Completed By: Technician II Nick Budkiewicz	Incident Commander: Lt Cooper
HM 506 Personnel Responding: Lt. Anthony, Tech II Budkiewicz, Tech I Davis HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
E507 requested a phone consult with the on duty hazmat technician after responding to a SICA. E507 officer reported that they had one, 51-year-old patient who was found lying on a bed covered in blood and the patient's mother had collected chunks of blood she had thrown up. E507 estimated the patient threw up 1 quart of blood. They also stated the patient was having respiratory problems. M507 trasported patient to the hospital. E507 reported the patient's 48 year old husband died on March 9, 2017 of an unknown respiratory illness. E507 also reported three other people living in the house were showing signs of respiratory problems but did not want treatment. E507 noted that all the walls in the house had what appeared to them to be black soot. They stated it was on both floors of the house, on furniture and the floor. E507 found a gas-burning vent less fireplace that also had black streaks coming out of it. E507 noted normal readings on the 4-gas monitor when the fireplace was off but when the fireplace was turned on CO readings were up to 26 ppm in less than a minute. E507 turned the fireplace and determined this to be the source of the hazard. All readings returned to normal once the fireplace was turned off. E507 requested the gas company and Red Cross to the scene. VA EOC was notified, no other action needed to be taken by HM 506.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/7/2017	Date:
Time: 17:41	Time:
Name: Thelma	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170010815	Date: 4/8/2017
Location:2200 Opitz Blvd	Time: 22:27
Report Completed By: Capt. Dan McCleese	Incident Commander: Captain McCleese
HM 506 Personnel Responding: Capt. McCleese, TII Greiner, TII J. Sanchez, TI Lautenbacher HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Potomac Hospital ER Staff requested a phone consult through PSCC . ER staff stated a family that had entered the ER claiming to be exposed to radiation while boating near the shores of Maryland (across from Leesylvania State Park).While boating/fishing their boat broke down and they drifted to the shores of Maryland. The family claimed they had spoken with Navy personnel and that were advised the area was restricted and that they were near radiation. The family was given a boat ride back from Navy personnel, however the watercraft did not appear to be Navy. This had occurred around 1500 on April 9. The family, Dumfries residents, explained that they were told by Navy personnel to go to the ER to get checked out. Captain McCleese intially spoke with Tina Melindez, the Charge Nurse at Sentera ER. The family was told to shower in the decon room at the ER. With some parts of the story being 2nd -hand, The decision was made to make hospital staff and the family comfortable by performing a "sweep" with radiation detection devices to ensure there were no hazards in the hospital. HM506 responded priority 2 to 2200 Opitiz, met with Nurse Melindez, and then spoke with the three Dumfries family members who claimed to be exposed. Two males, ages 52 and 17, and one Female, age 52 presented no symptoms other than the female pt explained she had a weird taste in her mouth, that the air tasted like Iron. A background reading was taken (Ludlum) of 8 micro-rems and then the patient and ER triage area was monitored- no levels were found above background. A PRD was also used to monitor the area, no levels found above background. Patients were told to monitor any symptoms and to seek medical attention if they felt ill or pain of any kind. ER staff was informed and made comfortable by finding no radiation readings above background. Patients were not able to confirm any identities of Navy Personnel nor their exact location but said they believed to be near Indian Head, MD.

RESPONSIBLE PARTY	OTHER PARTY
Name: Lucretia Smith	Name: Johnny Smith Jr
Company: Family	Company: family
Address: 3841 Dominion Dr Dumfries VA 22026	Address: 3841 Dominion Dr
Phone#: 571-445-1482	Phone#: 540-940-1465
Notes: 52, Mother with (Iron taste) symptom	Notes: father 52 yo Male

NOTIFICATIONS/CONTACTS

	Date: 4/8/2017
Date: 4/9/2017	Time: 11:00
Time: 00:45	Name: SA Aidan Garcia
Name: Collins	Comp/Agency: WMD Coordinator
Comp/Agency: VA EOC	National Capital Response Squad
Notes:	FBI - WFO
	Notes: emailed back and forth with Matt Adkins
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


ALERT
ALARM

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170011047	Date: 4/10/2017
Location:7344 Stream Walk LN/Balls Ford RD	Time: 22:04
Report Completed By: Lt. Anthony	Incident Commander: NA
HM 506 Personnel Responding: Lt Anthony, TII O'Donnell, TI Malone, TI Lienau, TI Davis HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION
E511 Dispatched to Home Depot parking lot for suspected dumping of fuel. E511 investigated side charlie of store and could smell diesel fumes coming from a creek behind the store. They traced the spill from a storm drain behind the store which dumps into a creek, which leads to a large retention pond in the front of the store. Booms were already in place by DEQ from a previouse dumping incident. E511 called for a hazmat consult. HM506 responded to the scene. E511 and T511 did a good job lighting the scene and taking defensive measures. On scene we added two more booms. It was clear the the fuel had been contained to a small area and had not progressed to the large retention pond. All units went in service except FM517. He stayed on scene to continue his investigation.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes: Under Investigation	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4-10-17	Date: 4-11-17
Time: 2340	Time: 0015
Name: Darshan Parikh	Name: Mark Miller
Comp/Agency: VAEOC	Comp/Agency: DEQ
Notes: Notified DEQ as well	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170011213	Date: 4/12/2017
Location:7468 Stream Walk Lane	Time: 10:04
Report Completed By: Lt Jones	Incident Commander: FMO Hubbel
HM 506 Personnel Responding: Lt Jones, Technician II Luke, Technician I Markley HS 516 Personnel Responding: Other HMT Personnel Responding: HMO 502 Capt Stewart	

INCIDENT DESCRIPTION

Station 506 received phone call around 0605 hours from FMO Hubbel for a HazMat phone consult. FMO Hubbel stated that he was on scene of an incident where a gasoline truck driver was pouring fuel down a storm drain behind the home depot in manassas (7468 Stream Walk Lane). He stated there was a limited amount of fuel still on the ground. Booms had already been placed in the drain run off from previous calls. There was another HazMat incident on 04/10/2017 run by C shift (Incident # 170011047) From the report given, there was nothing HM506 could do other than monitor the area around the drain. Everything in the storm drain would have to be cleaned up by whichever clean up crew the responsible party uses. Informed FMO that if they need us to come out to help with anything or to monitor, call communications and have us dispatched on the call or we could do another phone consult if things change.
Around 0800 hours, we received another phone call directly from FMO Hubbel. He stated he was going to take some samples of the fuel saddle tanks and the trailer's fuel tank as well as samples from the storm drain area. He requested HM506 to come out to assist with supplies and to monitor the area while he obtained samples. FMO stated they were waiting on a warrant and he would call communications when they had the warrants in hand and give us time to get to the scene before he started taking samples.

Arrived on scene where a tractor trailer was parked behind the home depot near a storm drain. The fuel truck (DOT 406) had some product soaked into the asphalt around both of the saddle tanks that led into the storm drain. FMO Hubbel on scene informed crews that the driver of the truck was observed overfilling his saddle tanks where the excess product was flowing into the storm drain. The water from the storm drain eventually runs into a retention pond in the parking lot of the store. Slight fuel odor around the truck and the run off pond where the storm drain dumps into. Slight sheen still on the water in the retention pond as noted in the report from Monday night.
HM506 assisted FMO with supplies for FMO Hubbel to take samples of both saddle tanks as well as the storm drain and each pod of the trailer. HM506 crew also monitored using 4 gas monitors on top of the trailer while FMO on top of the trailer and around the tractor trailer throughout the sample process. There were no changes in readings on any of the monitors during the whole process. FMO Hubbel was able to obtain samples as needed. No more need for HazMat personnel. HM506 released, scene left with FMO and PW PD on scene.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name: Christopher Smith
Company: Fleet Transit Incorporated	Company: Acadia Reality
Address:	Address: 3001 Brandywine Pkwy Wilmington DE 19803
Phone#:	Phone#: 302.388.5436 Office 302.479.5510
Notes:	Notes: Property Manager for location. He was on scene with FMO upon our arrival on scene. Has been involved

	with this for a few weeks. He is the main point of contact for the property management company that owns the property of the shopping center. He is working with a clean up company in regards to the previous spills.

NOTIFICATIONS/CONTACTS	
Date: 04/12/2017	Date: 04/12/2017
Time: 06:38 am	Time: 06:45
Name: Mark Aveeni	Name: Darshan Parikh
Comp/Agency: PWC Watershed	Comp/Agency: Va EOC
Notes: Courtesy Notification	Notes: Courtesy Notification
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes: .
Date:	Date:
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Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



1203
3

1203


PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD#170012066	Date: 4/20/2017
Location:1851 Rippon Blvd	Time: 10:35
Report Completed By: Lt. Shannon	Incident Commander: BC LaBass
HM 506 Personnel Responding: Shannon, Hoffman, Sanchez, Santiago HS 516 Personnel Responding: Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION
E512 and M512 were dispatched to an overdose call at the Mooney Plant, a wastewater reclamation facility. The comments advised that the person had inhaled something and was having difficulty breathing. E512 upgraded the call to a Hazmat. Once BC503 arrived and received additional information from the onsite safety officer and supervisor she downgraded the call and requested that we continue priority 2. Once we arrived on scene, we spoke with the site safety officer and supervisor to find out what had happened. The PT was conducting a test using a solution that was made up of: Laboratory water, Nitric Acid, and Mercury reference standard solution. The solution was in a 100mL vial that was spilled in a containment basin that was located under a ventilation hood. When the product was spilled, the PT was in poor position with his face located between the solution and the ventilation hood and inhaled some fumes. This caused an irritation of the respiratory track and difficulty breathing. The spill was contained to the basin and the onsite supervisor and safety officer advised me that there was no additional hazard and that they had procedures in place to clean up the spill. We turned the scene back over to the Prince William County Service Authority. I called HMO502 to advise them of the situation.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Prince William County Service Authority	Company:
Address: 1851 Rippon Blvd	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/20/2017	Date:
Time: 2027	Time:
Name: Chris Blake	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD#170012118	Date: 4/20/2017
Location:12101 Stallion Ct.	Time: 17:49
Report Completed By: Lt. Ross Shannon	Incident Commander: Technician II Waring
HM 506 Personnel Responding: Shannon, Snitwongse, Hoffman, Santiago HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
I received a phone consult for a spill of deisel fuel in the bed of a pick up truck. The truck was located in a parking lot. A small amount of fuel leaked from the bed of the truck onto the ground. It did not spread anywhere and adsorbant was used keep it from spreading. There were no waterways in danger of being contaimanated. The estimated amount of fuel in the bed of the truck was 1 gallon. We advised E514 to keep the truck in place until the fuel spill that was contained to the bed of the truck could be cleaned up. PD was on scene to assist with keeping the vehicle in place and finding the owner. While we were on the phone the owner came up too talk to the FD personnel. He was advised of the need to clean up the spill prior to moving the truck.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/20/2017	Date:
Time: 2032	Time:
Name: Chris Blake	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 17001253	Date: 4/25/2017
Location:Prince William pkwy/ Balls Ford rd	Time: 04:11
Report Completed By: LT Jones	Incident Commander: BC591 Chief Crispin
HM 506 Personnel Responding: Lt Jones, Tech II Cook, Tech I Mclauren, Tech I Makley HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
BC591 requested HM506 for a fuel spill due to an accident with fatality. A sedan t-boned a tractor trailer on the passenger side at the saddle tank and tire area. HM506 responded. While in route, requested update from BC591 who stated approx 80 gallon diesel saddle tank was leaking due to accident. Fuel in the road and on side of the road with no impact on the waterway or drains. Storm drains in the area were already blocked off with booms and sand due to construction in the area. Arrived on scene to find R504 and E525 crews had built up a dam (about 3/4 of a circle) on the side of the road where the saddle tank was leaking. The dam was doing a good job of retaining the majority of the product being released. Still product seeping underneath the dam as well as a large amount of fuel already on the roadway. Fuel ran down Balls Ford Rd going East on the west bound lanes. There was one stream of fuel going along the median in the middle of the road and one stream going along the dirt side of the road. The one going down the median was blocked by a dam (built by R504 and E525 crews) at the end of the already blocked storm drain and was pooling up. Some product still going around dam and seeping through dam that was running across the lanes at the intersection for the 7-11 and going across the east bound lanes. The stream going down the other side of the west bound lanes stayed along the dirt for about 100 feet and then began to run into the road until the intersection at the 7-11 where it also started to go across the east bound lanes. Had crews built up the dam by the storm drain for these and another dam in front of the storm drain. Back at the tractor trailer, HM506 used a collection pool off of the hazmat unit. Placed pool under the ruptured tank. Due to the passenger side of the truck being off the road way and the axle of the truck being bent, the saddle tank was low to the ground. Unable to get the pool to hold full capacity with height constraints. Unable to collect all of the leaking fuel with pool, but majority of the leak was flowing into the pool. Had E525 and R504's crews use absorbent off of HM506 to build up dam around the saddle tank. Also, had the crews with HM506 crew build a trench in the ground a few feet away to collect and product that seeped through the dam or was already on the ground pass the dam prior to arrival of fire dept. HM506 ran out of absorbent, but the dam appeared to be more than sufficient to retain what was left to leak out of the saddle tank and pool. Spoke with truck driver to find out that they were using Atlas Environmental as the clean up company. HM506 officer spoke with Matt from Atlas to give details on what was happening and how much product was on the ground. Full saddle tank - truck driver had just fueld up. Approx 70-80 gallons on the ground with about 20 gallons being collected in the pool. The right side of PW Pkwy north bound just north of Balls Ford rd to Balls Ford rd had some fuel in the dirt and ground there with the majority of the product flowing down the Pkwy and Balls Ford Rd. It looked like the booms around the storm drains were keeping the product out of the drains. It did not appear to have any fuel in the waterway or drain system. Atlas Environmental in route to begin clean up. PD on scene for investigation. HM506 cleared the scene with E525 and PD remaining on scene.

RESPONSIBLE PARTY	RESPONSIBLE PARTY
Name:	Name: Donald Thomas
Company: Old Dominion Freight Line Inc.	Company: Old Dominion Freight Line Inc.
Address: Thomasville, NC	Address: 2037 Spruce Ave, Holmes, PA, 19043
Phone#: 1-800-331-3837	Phone#: 610-675-9830
Notes: Courtesy Phone Contact	Notes: Driver contact Information

NOTIFICATIONS/CONTACTS			
Date:	04/25/2017	Date:	04/25/2017
Time:	5:30	Time:	5:00
Name:	Collins	Name:	Matt Caldwell
Comp/Agency:	VAEOC	Comp/Agency:	Atlas Environmental
Notes:		Notes:	Contacted through the freight company
Date:		Date:	
Time:		Time:	
Name:		Name:	
Comp/Agency:		Comp/Agency:	
Notes:		Notes:	
Date:		Date:	
Time:		Time:	
Name:		Name:	
Comp/Agency:		Comp/Agency:	
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Date:		Date:	
Time:		Time:	
Name:		Name:	
Comp/Agency:		Comp/Agency:	
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Name:		Name:	
Comp/Agency:		Comp/Agency:	
Notes:		Notes:	
Date:		Date:	
Time:		Time:	
Name:		Name:	
Comp/Agency:		Comp/Agency:	
Notes:		Notes:	

Additional Notes/Information:
HAZMAT Officer Comments:


USDOT 090849
PA A-0012/127
CA 12037 VA 0032
VIN ALAV6152


OD-TECHNOLOGY
OLD
DOMINION


Ford Rd


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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170013162	Date: 4/30/2017
Location:7507 Macnichol Ln. (Joe Davis)	Time: 04:40
Report Completed By: Tech II S. Jones	Incident Commander: E501(Akers)
HM 506 Personnel Responding: Lt Jones, Technician Bell, Technician S. Jones, Technician Campbell HS 516 Personnel Responding: Other HMT Personnel Responding: Technician Cook on K506	

INCIDENT DESCRIPTION	
Incident # 170013162. Phone console from E501 Master Tech. Akers. Investigation to a propane tank for a possible propane explosion. Upon further investigation E501 found the propane tank in tact outside of the residence. E501 had no LEL readings on the 4 gas. All 4 gas readings remained normal. This was from one of two 250 lb propane tanks outside of the residence. E501 found a relief valve that had activated and popped off the plastic cap. E501 shut off the propane tank and advised home owner to call the propane company. No further hazards. Scene was turned over to homeowner.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Joe Davis	Name:
Company:	Company:
Address: 7507 Macnichol Ln., Manassas, VA	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/30/2017	Date:
Time: 7:37 PM	Time:
Name: Chris Blake	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
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Comp/Agency:	Comp/Agency:
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NOTIFICATIONS/CONTACTS	
Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


CO: 0ppm
H2S: 0.0ppm
OXY: 20.9%
LEL: 0%LEL
RAE
SYSTEMS

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170013596	Date: 5/4/2017
Location:13770 Smoketown Road	Time: 16:21
Report Completed By: Tech II Budkiewicz	Incident Commander: Capt Saager
HM 506 Personnel Responding: Lt. Anthony, Tech II Budkiewicz, Tech I Gibson, Tech I Lienau HS 516 Personnel Responding: Lt. Samuels, Tech II Schultz Other HMT Personnel Responding: Matt Adkins, Capt Stweart, Tech II Williams, Tech I Cone	

INCIDENT DESCRIPTION	
HM506, HMO501 and HMO502 was dispatched for a Hazmat that was initially dispatched as an inside gas leak and was upgraded by BC503. Initial reports were that they had a strip mall with a building under construction and crews reported CO readings of 70ppm and HCN readings of 10ppm. Once on scene HM506 split into two teams with members from E516 and E514. BC502 created a hazmat branch making HMO502 hazmat branch supervisor, entry team 1 and 2 were formed. Entry team 1 made entry into Aldi and reported readings as follows; Alpha quadrant 16 ppm CO on the 4 gas monitor and 90 ppm on the PID, Bravo and Charlie quadrants had readings of 6ppm CO on the 4 gas and 3000ppb on the PID, Delta quadrant readings were 6ppm CO on the 4 gas and 90 ppm on the PID. Entry team 1 then made entry in to The Village Thrift Store and reported the following readings; Alpha quadrant had readings of 2ppm CO on the 4 gas and 90ppm on the PID, Bravo and Charlie quadrants had readings of 3000ppb on the PID and the Delta quadrant had readings of 2ppm CO on the 4 gas and 90ppm on the PID . It was determined the readings were caused by exhaust from a gasoline powered engine being used inside the structure. The structure was ventilated and readings returned to normal. HM506 placed in service.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: The Village Thrift Store	Name:
Company:	Company:
Address: 13770 Smoketown Road	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 5/4/17	Date:
Time: 21:30	Time:
Name: Kari Magner-Harper	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
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Name:	Name:
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Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD#170014458	Date: 5/12/2017
Location: 9900 Arrowood Drive, Manassas	Time: 07:35
Report Completed By: Technician II Brendan Hayes	Incident Commander: Lieutenant Phil Miller
HM 506 Personnel Responding: Lieutenant Dave Jones (Phone Consult) 516 Personnel Responding: TII Hayes, TII Smith Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
E516 Responded to a "Hazard" call for an antifreeze spill at the above address. E516 crew responded with E516 and HS516. HS516 was brought just in case containment supplies were needed. E516 & HS516 arrived on scene to a AAA Trash Removal Truck still on scene that had released approximately 3-5 gallons of antifreeze/coolant onto the residential roadway. The driver had already placed booms and absorbent pads down to absorb and slow the spreading of the spill. There was no active leak and the majority of the product had been contained. E516 crew placed an oil dry v-dike to absorb and contain the remainder of the product. No waterways or sewer utilities were threatened by the spill. Lieutenant Miller requested a phone consult with the Duty Hazmat Technician through communications mainly as a courtesy call and a heads up. HM506 was not needed at the scene; E516 crew would handle. Technician Hayes obtained the dispatch phone number from Misael Sosa, the driver of the AAA Trash Removal Truck. Technician Hayes spoke with the AAA Recycling & Trash Removal Services dispatcher Robert Thomas via phone. Mr. Thomas stated that the in-house cleanup crew ETA was two hours. Mr. Thomas stated that Ray Martinez (below), the supervisor, would be the point of contact for the cleanup effort. E516 & HS516 returned to service.

RESPONSIBLE PARTY	OTHER PARTY
Name: Ray Martinez	Name:
Company: AAA Recycling & Trash Removal Services	Company:
Address: 4619 West Ox Rd, Fairfax, VA 22030	Address:
Phone#: 571-355-2677	Phone#:
Notes: Supervisor	Notes:

NOTIFICATIONS/CONTACTS	
Date: 5/12/2017	Date:
Time: 14:31	Time:
Name: Magner-Harper	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:

Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


MACK
2151


2151
AAA
703-818-8222
aaatrash.com
USDOT
788827


AAA
Recycling and Trash
Removal Services
FAIRFAX, VA.
703-818-8222
PW733
Operated By
REPUBLIC
SERVICES OF VIRGINIA LLC
USDOT 788827


FAIRFAX, VA
703-818-8222
W733


MACK
VA TRUCK N
26-858 HA
PERMANENT


MACK

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170017434	Date: 6/6/2017
Location:1903 Stevens Rd	Time: 16:49
Report Completed By: Lt. N. Baskerville	Incident Commander: Tech II Mory
HM 506 Personnel Responding: N/A HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Tech II Mory from E502 contacted PSCC for a phone consult. A pediatric patient reported dizziness after inhaling glue being used for plumming work. The crew from E502 noticed O2 readings were slightly decreased in the apartment that was checked (20.1%). Readings were taken at ceiling, waist, and knee level. E502 ventilated the apartment and retook readings. Readings are now average O2 readings (20.9%). All other readings for substances are 0. E502 sent pictures of the contractor and the container.	
RESPONSIBLE PARTY	**OTHER PARTY**
Name: Kevin McCready	Name:
Company: Bonaventure Construction	Company:
Address: 7108 Fernwood St, Richmond, VA 23228	Address:
Phone#: 804-241-4527	Phone#:
Notes: The Company doing the plumming work	Notes:

NOTIFICATIONS/CONTACTS	
Date: 6/6/2017	Date:
Time: 1748	Time:
Name: Tyler Ellis	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

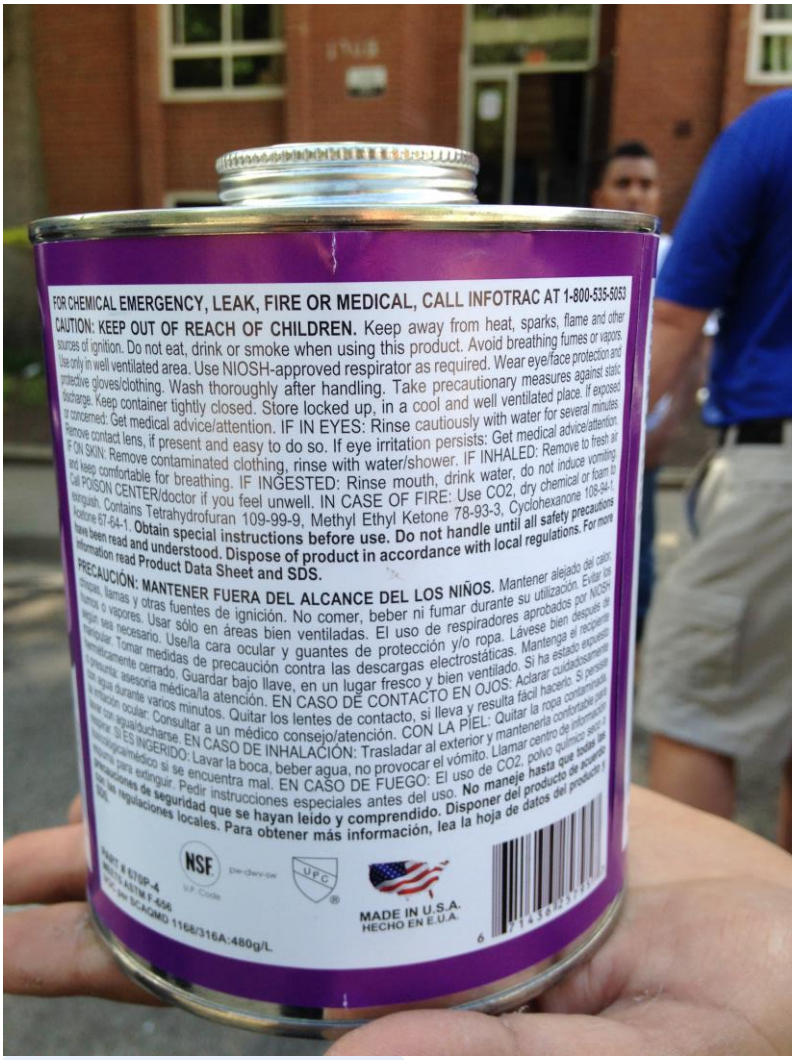
NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


Kevin McCready
Site Superintendent
7108 Fernwood Street
Richmond, VA 23228
T 804.241.4527
kevin.mccready@bonaventure.com
BONAVENTURE.COM
GOOSE & MAVERICK.
TOM & JERRY.
EVERYONE NEEDS A GOOD WINGMAN.
WE CAN BE YOURS.
BONAVENTURE
CONSTRUCTION, LLC


LSP
SOLVENT CEMENTS
617C PVC CEMENT
HEAVY BODY
LOW VOC


LSP
SOLVENT CEMENTS
670P PURPLE PRIMER
PURPLE
LOW VOC


FOR CHEMICAL EMERGENCY, LEAK, FIRE OR MEDICAL, CALL INFOTRAC AT 1-800-535-5053
CAUTION: KEEP OUT OF REACH OF CHILDREN. Keep away from heat, sparks, flame and other sources of ignition. Do not eat, drink or smoke when using this product. Avoid breathing fumes or vapors. Use only in well ventilated area. Use NIOSH-approved respirator as required. Wear eye/face protection and protective gloves/clothing. Wash thoroughly after handling. Take precautionary measures against static discharge. Keep container tightly closed. Store locked up, in a cool and well ventilated place. If exposed or concerned: Get medical advice/attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lens, if present and easy to do so. If eye irritation persists: Get medical advice/attention. IF ON SKIN: Remove contaminated clothing, rinse with water/shower. IF INHALED: Remove to fresh air and keep comfortable for breathing. IF INGESTED: Rinse mouth, drink water, do not induce vomiting. Call POISON CENTER/doctor if you feel unwell. IN CASE OF FIRE: Use CO2, dry chemical or foam to extinguish. Contains Tetrahydrofuran 109-99-9, Methyl Ethyl Ketone 78-93-3, Cyclohexanone 108-94-1, Acetone 67-64-1. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Dispose of product in accordance with local regulations. For more information read Product Data Sheet and SDS.
PRECAUCIÓN: MANTENER FUERA DEL ALCANCE DEL LOS NIÑOS. Mantener alejado del calor, chispas, llamas y otras fuentes de ignición. No comer, beber ni fumar durante su utilización. Evitar los humos o vapores. Usar sólo en áreas bien ventiladas. El uso de respiradores aprobados por NIOSH según sea necesario. Use/la cara ocular y guantes de protección y/o ropa. Lávese bien después de manipular. Tomar medidas de precaución contra las descargas electrostáticas. Mantenga el recipiente herméticamente cerrado. Guardar bajo llave, en un lugar fresco y bien ventilado. Si ha estado expuesto o preocupado: asesoría médica/la atención. EN CASO DE CONTACTO EN OJOS: Aclarar cuidadosamente con agua durante varios minutos. Quitar los lentes de contacto, si lleva y resulta fácil hacerlo. Si persiste la irritación ocular: Consultar a un médico consejo/atención. CON LA PIEL: Quitar la ropa contaminada. Lavar con agua/ducharse. EN CASO DE INHALACIÓN: Trasladar al exterior y mantenerla cómoda para respirar. SI ES INGERIDO: Lavar la boca, beber agua, no provocar el vómito. Llamar centro de información toxicológica/médico si se encuentra mal. EN CASO DE FUEGO: El uso de CO2, polvo químico seco o espuma para extinguir. Pedir instrucciones especiales antes del uso. No maneje hasta que todas las precauciones de seguridad que se hayan leído y comprendido. Disponer del producto de acuerdo con las regulaciones locales. Para obtener más información, lea la hoja de datos del producto y SDS.
NSF
UFC
MADE IN U.S.A.
HECHO EN E.U.A.
SCAQMD 1168/316A:480g/L

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD 170017665	Date: 6/8/2017
Location:154 mm I 95 North Bound Truck Scales	Time: 15:24
Report Completed By: Lt Dave Jones	Incident Commander: PW PD Officer Drumm
HM 506 Personnel Responding: Lt Jones, Tech II luke, Tech Bell, Tech I Campbell, Tech I Kent HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Phone consult with officer Drumm for leaking trailer at the rest area behind the truck scales on 95 north bound. Trailer carrying a load of 1,303 large bottles of Pine-Sol cleaner. Approx 3 gallons on the ground. Truck company, Western Express, stated they had a clean up crew en route. Duty HazMat Tech (Lt Jones) spoke with officer Drumm to get details. Officer Drumm stated that they did not think they would need any fire department services. They just wanted to inform the HazMat team of what happened. State trooper on scene also assisted officer Drumm with information and handling of the call. Decided that no fire services were required and told officer to call back if anything changes or if they need any assistance from us in anyway. Received a phone call directly from Officer Drumm approx 15 minutes later. He stated that the company was from Tennesse and were unable to get anyone out for at least a day and a half to take care of the issue. Officer Drumm also stated that he thought more product had leaked. Lt Jones told him that we would come out to take a look at what is going on and to at least put down some absorbent and work with company to get a clean up crew out sooner. Also, after speaking to office Drumm, I contacted Redman's Fleet services to see if they had an empty trailer available to remove the good pallets so the clean up company can take care of the trailer before it gets towed by Redman's. They had the ability. Called Officer Drumm back to let him know to contact Redman to make this happen. He was trying to sort this out and was thankful that we were able to come up with a solution for him. Arrived on scene to find tractor trailer in rest area behind weigh scales on i 95 north bound. Fluid leaking from the driver front side above the trailer wheels and from the rear driver side around the back door. The back door was open already. Strong smell of cleaner inside the trailer but nothing outside of the trailer. E506 placed absorbent on top of both spills and placed extra absorbent around both "leaks" to form a V Dike in case any other fluid leaked out. Approx 3 gallons total on the ground and approx 3 gallons of product on the floor of the trailer inside. Trailer carrying pallets of Pine-Sol. Large bottles that were shrink wrapped on pallets. while in transit some of the pallets fell or the product slid around and approx 4 pallets worth of Pine-Sol bottles were loose on the ground or piled on the floor of the trailer closest to the cab or tractor. 2 pallets side by side with the first 8 rows (16 pallets total) were left in tact and were fine. the pallets after that had fallen or unwrapped. Plenty of loose bottles and bottles that appeared to be leaking slightly from possible cracks or completely broken open. Officer Drumm had taken pictures of the inside for us. Tow company arrived on scene to start work on unloading bad trailer so the clean up crew can come in to do the clean up on the ground and trailer. First environmental was contacted by the truck company for clean up with an half hour ETA. No hazards and no additional services required from HazMat or Fire Dept. The main reason for the response was to assist the PD with getting a clean up company as well as a tow company that can take care of all of their needs. Assist PW PD. Cleared scene with Pd in control of scene and tow truck company gettting things organized to start moving product when the new trailer arrives. HM506 and E506 available.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Western Express	Company:
Address:	Address:

Phone#:	Phone#:
Notes: PD and VSP handling the call. PW HazMat only a consult to assist PD.	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


CAUTION
WIDE
TURNS
0744372


201279
WESTERN
EXPRESS


EXPRESS

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170018223	Date: 6/13/2017
Location:12658 Dara Dr	Time: 10:36
Report Completed By: Tech II Snitwongse Tech I Sawyer	Incident Commander: Captain Saager
HM 506 Personnel Responding: Lieutenant Shannon, Tech II Weaver, Tech II Snitwongse, Tech I Sawyer HS 516 Personnel Responding: N/A Other HMT Personnel Responding: Lieutenant Hornaday Engine 502	

INCIDENT DESCRIPTION
HM506 was dispatched on a biological call type at 12658 Dara Dr. R506 personnel responded with HM506 and R506. Initial comments reported that maintenance personnel of apartment complex called 911 and had stated a package was opened and white powder was spread on the exterior of the building. It was unknown to PD and maintenance personnel who opened the package. HM506 arrived on scene and met with E502. E502 officer stated that the white powder was identified as "boric acid" and it was sold as a roach and ant killer. The original package recipient was identified by package label and had stated that he reported the package missing. PD on scene determined the package was stolen and tampered with. Due to the determination by PD, there was no malicious hazard. HM506 documented the scene and collected all of the evidence for PD. The boric acid was neutralized with water from E502 to eliminate the spill. The Scene was returned to the property manager. HM506 and R506 went in service.

RESPONSIBLE PARTY	OTHER PARTY
Name: N/A	Name:
Company: N/A	Company:
Address: N/A	Address:
Phone#: N/A	Phone#:
Notes: N/A	Notes:

NOTIFICATIONS/CONTACTS	
Date: 06/13/17	Date:
Time: 2158	Time:
Name: Bartol	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


ROACH & ANT
KILLER
BORIC ACID

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170018633	Date: 6/17/2017
Location:12770 Minnieville Rd.	Time: 00:01
Report Completed By: Lt. Shannon	Incident Commander: Lt. Shannon
HM 506 Personnel Responding: R. Shannon, E. Weaver, D. Hoffman HS 516 Personnel Responding: Other HMT Personnel Responding: I. Jones	

INCIDENT DESCRIPTION
We received a phone call at St. 6 for a phone consult from the crew on M514. They were on a call where two police officers were exposed to something in a car while doing a search after a traffic stop. The two officers were complaining of a slight burning sensation after inhaling a chemical. The inhalation occurred when a plastic bag was opened. The bag was immediately closed. The police officers were not able to identify the chemical but suspected that is was something used to create a synthetic marijuana. Because the officers were in the vehicle when the bag was opened and having a reaction to what was inhaled it was determined that DECON was necessary prior to transport to the hospital. We decontaminated both officers and the person that was driving the car. We set-up DECON in the onsite carwash to provide shelter and a way to control water runoff. Because the detained person was not cooperative we preformed a strip and flush decon and then redressed him in a gown. The officers were decontaminated by removing there uniform from the waist up and washed there entire upper body with soap and water. The officers redress in clean clothes after DECON and were transported to the hospital by M514. The detained person was transported by A502.

RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 06/17/2017	Date:
Time: 02:10	Time:
Name: Christopher Lowe	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 170019102	Date: 6/20/2017
Location:15905 Uppsala Court	Time: 20:38
Report Completed By: Lt. Jones	Incident Commander: Lt. Jones
HM 506 Personnel Responding: D. Jones, T. Luke, T. McLaurin, S. Kent HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Police department on scene for an unkown item. Homeowner returned home from work to find a small cigar looking item in their mailbox. They brought the item into their house. After looking at the item farther, the homeowner decided to place the item in a paper bag and put it on their deck out back. PD arrived on scene. PD moved the paper bag to their cruiser and placed the bag on the front windshield. PD opened the bag to look at the item. Item appeared to be a green leafy roll wrapped around a yellowish powder. PD called communications who suggested HazMat. UFRO contacted Duty HazMat tech. PD requested HazMat to come out to see to determine what the item may be. HM506 and E506 dispatched. Upon arrival on scene, crew members met with PD to see where the product was located. Tech II Luke and Lt Jones used monitors (4 gas and PID) as we approached the bag and product inside. Tech II Luke removed the product wrapped in a paper towel in side the paper bag. No change in readings on either monitor. Tech II Luke obtained a sample to test with the true defender monitor. No matches found by the true defender. Contacted Captain Stewart to update on situation. Item appeared to be leaves rolled into a cigar shape around some yellow powder. Powder did not resemble and known item for PD. HazMat and PD agreed the product appears to simply be leaves and pollen. PD questioned home owners and neighbors with no evidence of a threat or foul play. Home owners did not feel this was a threat to them. Assured home owners that we found no evidence with our equipment that would cause concern. Home owners had handled the product 3 hours prior to arrival of HM506 and E506. PD also handled item. No symptoms or issues with home owner or PD. Advised home owner to seek immediate medical attention if they start to show any signs or symptoms of anything abnormal. PD placed item in a plastic bag and secured product as evidence. Turned scene over to PD.

RESPONSIBLE PARTY	OTHER PARTY
Name: Officer Mehta	Name:
Company: PWC PD	Company:
Address: 15948 Donald Curtis Drive	Address:
Phone#: 703-792-4077	Phone#:
Notes: Point of Contact for PD on incident.	Notes:

NOTIFICATIONS/CONTACTS	
Date: 06/20/2017	Date:
Time: 00:08	Time:
Name: Ms Harper	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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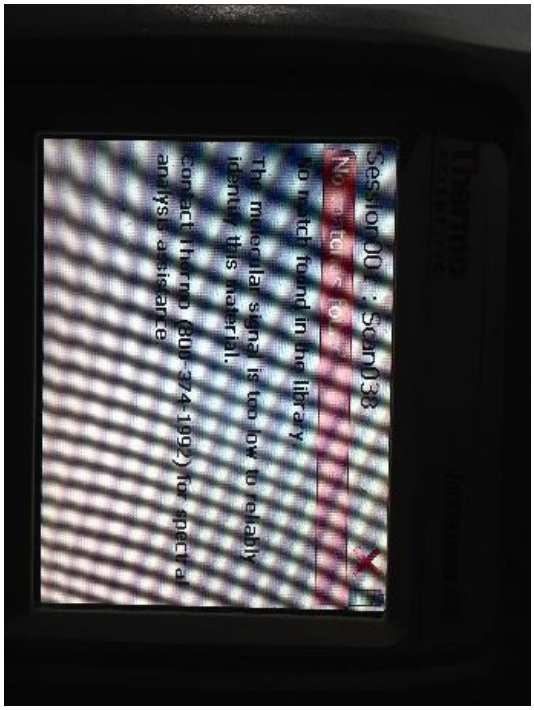
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


Session00 : Scan038
No material found in the library
The material signal is too low to reliably
identify this material.
Contact Thermo (800-374-1992) for spectral
analysis assistance

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD170019145	Date: 6/21/2017
Location:12831 Harbor Drive	Time: 09:35
Report Completed By: Schwab	Incident Commander: Capt. Saager
HM 506 Personnel Responding: Lt. Schwab, T-II Williams, T-I Cone, T-II Periera, T-II Budkiewiscz HS 516 Personnel Responding: Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION
Received a phone call from HMO 502 in regards to a call that was getting ready to be dispatched dealing with two police recruits that got in a police cruiser and started to feel nauseous. One of the police cars was involved in a Hazmat incident on Friday June 16th involving possible Synthetic Marijuana. HM506, R506 and E506 went enroute to the original dispatched address at 12904 Donald Curtis Drive. E506 arrived on scene at Donald Curtis Drive and spoke with the recruits. One recruit was complaining of a headache when he was in the car but went away after he got out. The other recruit was not complaining of anything. Both were evaluated by M523 and their vitals were normal. It was later found out that the cruiser was being cleaned at Tacketts Mill car wash located at 12831 Harbor Dr. HM506, R506, E506 and HMO 502 were diverted to the car wash to investigate the car along with E514 being dispatched. E514 arrived on scene and the car wash company had already isolated the vehicle in the parking lot. E514's crew lined the area off with fire line tape and spoke with the employees who were working on the cruiser. They did not notice anything, feel any different or smell anything while they were cleaning or inside the cruiser. We obtained a background for the PID using HMO 502's vehicle and we got a reading of 36ppm. T-II Budkiewicz, T-II Williams and T-I Cone donned structural gear without SCBA and took the shopping basket to monitor the cruiser. There was nothing unusual when they came up to the vehicle the opened the rear door and the only smell noticed was the smell of cleaner. There was a small puddle of liquid in the vehicle and pH paper was placed and hit a deep blue. We spoke with the owner of the car wash, asked him what cleaner they used to clean the vehicle and how far they got with cleaning the vehicle. He stated they got half way through the cleaning before they pulled it out and used two cleaners on the interior. The cleaners were Magic Bright Maxi Clean all purpose cleaner, which matched the pH we found in the vehicle, and Dymon Liquid Alive, which didn't. The PID was placed inside the cruiser and the door were closed. The readings reached up to 47 ppm and fluctuated. The 4-gas meter was also placed inside and readings were normal. We attributed the readings on the PID to the chemicals used and the heat. The doors to the cruiser were opened and we ventilated for several minutes using a smoke ejector. We placed the PID back in the vehicle and closed the door for several minutes the PID read 0 ppb. After discussing with HMO 502, the cruiser was turned back over to PD and advised that they tow the vehicle back to the station and not allow anyone to use it until the test results come back from what the vehicle was originally exposed to.

RESPONSIBLE PARTY	OTHER PARTY
Name: Capt.James L Carr	Name:
Company: PWCPD	Company:
Address: 15948 Donald Curits Drive	Address:
Phone#: 571-238-1216	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS

Date: 6/21/17	Date:
Time: 14:22	Time:
Name: Dan	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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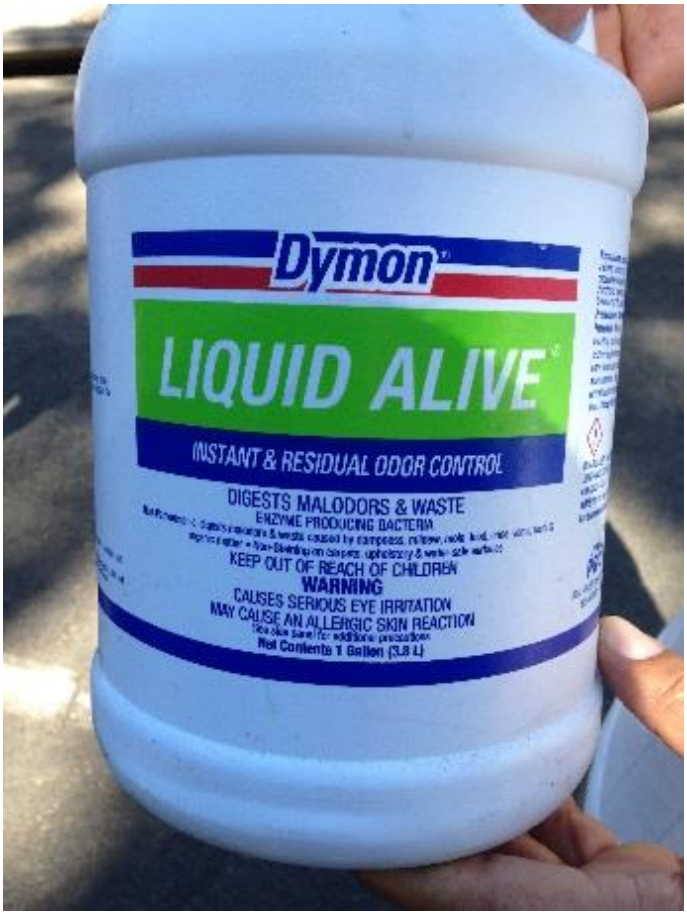
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:


COUNTY POLICE
VIRGINIA
181-516L


Tacketts Mill
CAR WASH


MB
MAGIC BRIGHT
MAXI-KLEEN
ALL PURPOSE SHAMPOO


Dymon
LIQUID ALIVE
INSTANT & RESIDUAL ODOR CONTROL
DIGESTS MALODORS & WASTE
ENZYME PRODUCING BACTERIA
KEEP OUT OF REACH OF CHILDREN
WARNING
CAUSES SERIOUS EYE IRRITATION
MAY CAUSE AN ALLERGIC SKIN REACTION
Net Contents 1 Gallon (3.8 L)

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 1700004759	Date: 2/13/2017
Location:8386 Sudley Rd	Time: 18:35
Report Completed By: T-II Hoffman	Incident Commander: N/A
HM 506 Personnel Responding: Lt. Shannon, T-II Hoffman, T-I Podobed, T-I Sawyer HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
Station 6 received a request for a Haz-Mat phone cosult from the UFRO (Lt. Gillis). Lt. Shannon called Matt Richards, a representative from E511, to initiate the consult. Mr. Richards advised they were on scene in the Wal-Mart parking lot with a garbage truck that was leaking hydraulic oil with approximately 15 gallons spilled. Mr. Richards advised that the trucking company was already on scene and were in the process of cleaning up the spill. He advised that there were no water ways or strorm drains effected. Lt. Shannon advised E511 to provide an LEPC form to the trucking company and to ensure they know that they have to dispose of the absorbant being used properly. Also to advise Wal-Mart management of the situation and let them know that the situation is under control. The phone call was ended and Lt. Shannon called VA EOC to provide a courtesy notifictaion.

RESPONSIBLE PARTY	OTHER PARTY
Name: KMG Hauling	Name:
Company:	Company:
Address:	Address:
Phone#: 703-361-1100	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/13/2017	Date:
Time: 18:50	Time:
Name: Chris Isaac	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: Matt Richards - E511 - 703-898-1373
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 16080900032004	Date: 8/9/2016
Location:1851 Rippon Blvd	Time: 08:57
Report Completed By: Capt. K. Stewart	Incident Commander: Capt. B. Ross
HM 506 Personnel Responding: Lt. Forbes, Cook HS 516 Personnel Responding: Lt. Trochan, Smith, Hayes, Sawicki Other HMT Personnel Responding: HMO502, Capt. K. Stewart	

INCIDENT DESCRIPTION
Received phone consult at 08:57 from TII Reed who was on scene of an inside gas leak with E510 which had first been dispatched as a fire alarm. Received from him information of a release of a gas of unknown quantity or type from a laboratory at the H.L. Mooney Plant which caused an alarm. Building was evacuated with no one displaying signs or symptoms. Lt. Forbes, Duty Hazmat Tech finished the consult by stating that hazmat units would respond and that units on scene should to continue to keep people out. HMO502, Stewart, who took part in the phone consult, phoned Communications and added HMO502, HM506, and HS516 to the inside gas compliment already on scene. Upon hazmat units arrival at 09:30, met with Safety and Security Manager and Laboratory Specialist. Received MSDS sheets for Digestive Reagent with Mercury Catalyst. Representative reported that gas may have been released when the digester fume hood malfunctioned where the process was occurring. Laboratory exhaust hoods were functioning but the digester hood registered a low flow alarm. Also informed that the process completion was at 10:15. Confirmed anticipated reduction in temperature once process completed. Began chemical reference and made assignments of personnel. Identified chemicals involved with process: Water 62.96%, Sulfuric Acid 27.11%, Potassium Sulfate 9.77%, Mercuric Oxide .15%. Held entry briefing at 10:15. Defined objectives: confirm process completion, secure power to the digester, monitor primarily with 4 gas, PID, Mercury Vapor Draeger Tube, and Acid Draeger Tube, and provide visual feedback via Facetime to Laboratory Specialist and IC. PPE established as Structural firefighting gear with SCBA. Turn back established as color changes to pH paper or a positive hit for acid via air sampling with Acid Draeger tube. Decon established as gross at E510 in structural firefighting gear with SCBA, R510 assigned to RIT with hoseline (dry) in place, Identified Entry Team 1 and Entry Team 2. Entry Team 1 confirmed background readings on MultiRae Pro and 4 gas monitor and made entry at 10:33. Throughout incident there were no changes reported by either of the entry teams from normal background readings via the MultiRae Pro and 4 gas. At 10:39 the digester power was secured. Draeger sampling occurred without color change. Entry Team 1 reported some off gassing from chemicals from the digester area within the hood alarming for low flow. Lab Specialist stated that the chemicals will continue to off gas until the temperature reduces to low enough levels, approximately 30 minutes. Gas was confined to the hood and hood was functioning though at a low capacity. Lab Specialist identified a separate process for which she wanted the team to secure power and they did so. Siemens representative, an air/hood specialist, arrived on scene and Entry Team 2 was sent to the roof at 10:57 with the tech to constantly monitor while tech confirmed exhaust fan activity. At 10:59 Entry Team 1 operating inside the laboratory reported a target hit on the M908 for dimethylmethlyphosphonate (without change to the PID readings) and were told to exit the structure to reassess threat. The target was determined to be a cross sensitivity as the laboratory specialist listed chemicals and processes none of which would result in this compound. No changes to the PID or the LCD 3.3 also confirmed that a CWA was unlikely. Prior to entry a phone consult was held with the M908 24/7 call center and they had reported that the M908 may show some signs of acid though not as a direct target hit. At 11:20 it was reported that a second process containing phenol may have overreacted and spilled in the area. Prior to the air/hood repairman entering the lab with Team 2 it was decided to send another team into the lab with visual monitoring capability via Facetime so the Lab Specialist could get another look to be sure the snorkel and hood were in place for the process involving phenol. Entry Team 2 was told to exit the structure with the hood technician. Team 1 entered at 11:33 and confirmed a small spill mostly under the hood. The Lab Specialist identified this as the phenol process but confirmed that most of the spill was contained

under the functional hood and unlikely to cause any problems. Team 1 sampled once again for mercury vapor and acid with Draeger tubes and again reported no changes in color and no changes from normal on any of their monitors. They exited the lab and reported to command post at 11:49. Representatives from the Mooney plant were informed of what was monitored for and that according to our monitors any hazard that may have been present from the malfunctioning hood was gone and probably originally contained by hood system. Informed them of the need for additional monitoring via their own industrial hygienist, to provide for respiratory protection of their people according to the recommendations of their hygienist and best practices, to clean the spill according to regulations and laboratory protocol, and that they would need to complete repairs on their hood. No one in general proximity of the laboratory identified any signs or symptoms prior to placing units in service. No decon was performed as nothing was found except for the small phenol liquid spill which no one had touched and which occurred after all lab personnel had evacuated the structure. At 11:56 the incident was released to management.

RESPONSIBLE PARTY	OTHER PARTY
Name: Joseph Del Priore	Name: Sarah Parkin
Company: Service Authority	Company: Service Authority
Address: 1851 Rippon Blvd. Woodbridge VA 22191	Address: same
Phone#: 703-609-4524 cell	Phone#: 703-393-2060
Notes: Safety & Security Program Manager	Notes: Laboratory Specialist

NOTIFICATIONS/CONTACTS	
Date: 08/09/2016	Date:
Time: 1500	Time:
Name: McManas	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
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Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: 8/10/16 Follow phone conversation with Mr. Del Priore: Hood technician found high levels of corrosion inside the exhaust ductwork reported due to incorrect ductwork material installed which resulted in the low flow alarm on the hood. The unit was placed out of service indefinately as they work with original installer. Initial fire alarm believed to be caused by steam from dishwasher. The alarm was reset without further activation and a worker acknowledged a large release of steam just as fire alarm activated. Also discussed lab evacuation procedures and the need for additional training of lab personnel. Fire department will be invited to participate in the future.

HAZMAT Officer Comments: I was at Station 6 for original consult and responded and arrived on scene with HM506. Established Hazmat Group and assumed supervisory role of the group. After units were released I received a report that the area was swabbed in three areas by personnel acting upon recommendations of the plant's industrial hygienist and all were negative using a litmus test expected to indicate the presence of phenol.






PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #:	Date: 8/18/2016
Location:Interstate I95 MM 152.5	Time: 10:44
Report Completed By: Lt. Forbes	Incident Commander: Capt. Saager
HM 506 Personnel Responding: Forbes, Cook, Parisi HS 516 Personnel Responding: Hayes, Trochan, Smith, Sawicki Other HMT Personnel Responding: Stewart	

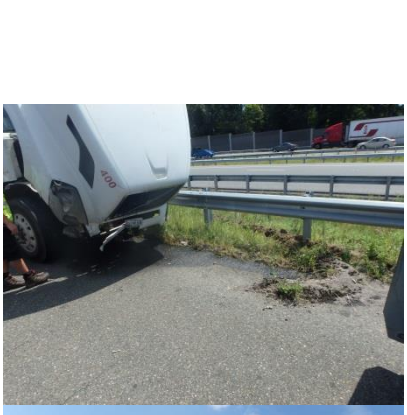
INCIDENT DESCRIPTION
HM506 was dispatched for a Hazmat (diesel fuel leak) at I95 south mile marker 152.2. While enroute HM506 was advised by BC503 (Capt. Saager) that a tractor trailer was leaking fuel from a diver side saddle tank. The damaged fuel tank carried approximately 80 gallons of fuel. On scene HM506 found a tractor trailer driver fuel tank leaking. E510 had performed defensive operation. HM506 used two pop-up pools to contain the leaking fuel. HM506 also utilized absorbent to contain leaked fuel on the roadway. There were approximately 20-40 gallon of diesel fuel leaked on the roadway and grass area, the rest was contained with pop-up pools. No diesel fuel ever entered any storm drain or waterway, Atlas environmental was on scene to preform cleanup operations. VAEOC and DEQ were notified.

RESPONSIBLE PARTY	OTHER PARTY
Name: Corha Mathew Johnson	Name: William Johnson
Company: Reycle one (JLT, INC Trucking)	Company: JLT Trucking Operation Manager
Address: 7800 Lawrence St. Hayattsville MD 20781	Address: 1818 New York AVE NE Ste 223 Washington, DC 20002
Phone#: (301) 779-3170	Phone#: (240)485-7349
Notes: Company had no clean up company and stated that he would like to use Altas Enviromental as the clean up company.	Notes:

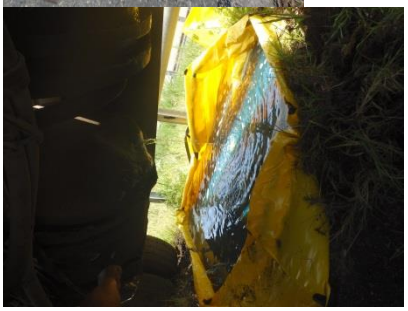
NOTIFICATIONS/CONTACTS	
Date: 08/18/2016	Date:
Time: 11:55	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Notified of approximatly 80 gallons of diesel leaked on to the roadway and grass median	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: The following supplies were used on the call: 79 and 20 gallon pop-up pools, two bags of absorbent, one pair locking pliers
HAZMAT Officer Comments:





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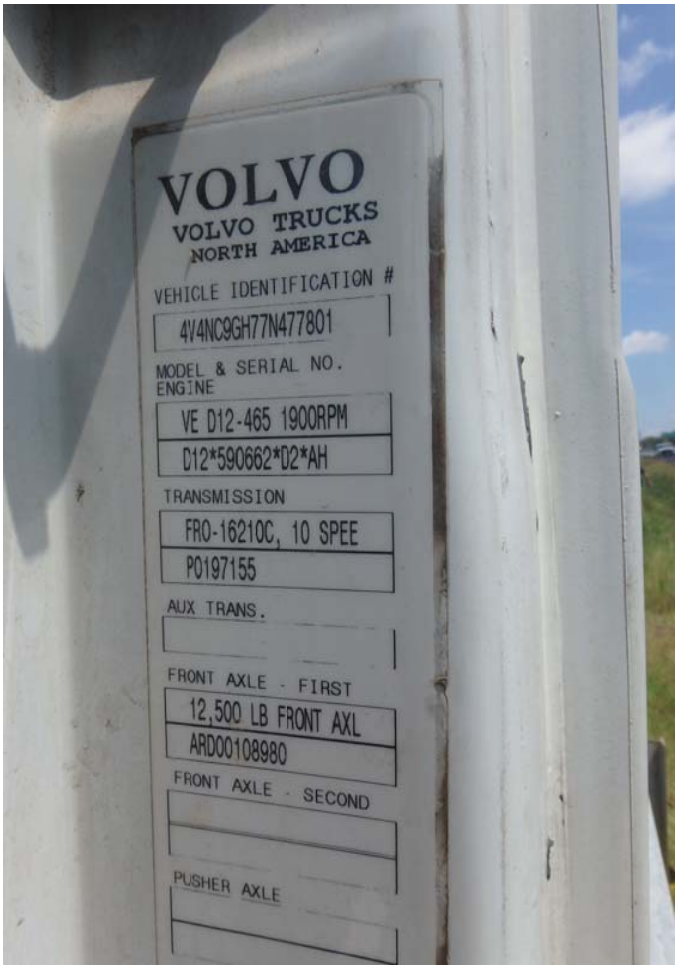
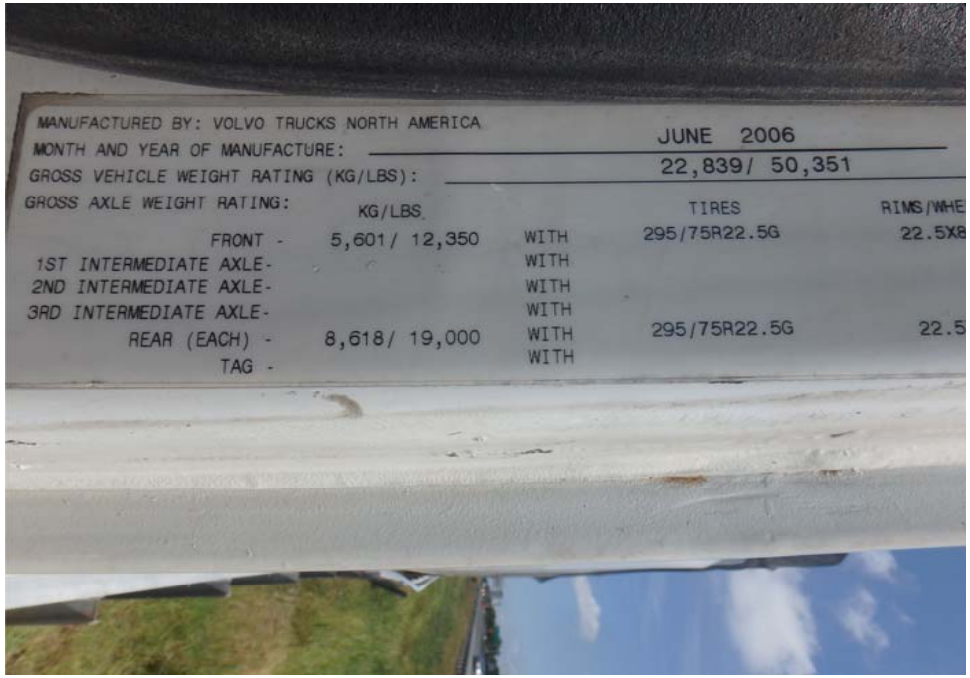
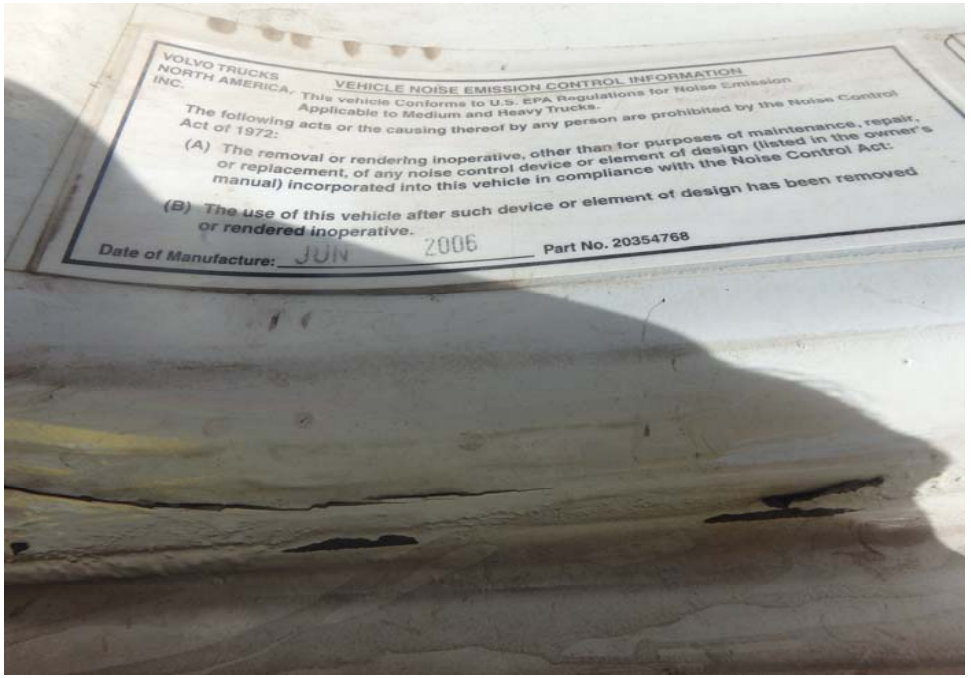
MD 500992
16


VOLVO
VOLVO TRUCKS
NORTH AMERICA
VEHICLE IDENTIFICATION #
4V4NC9GH77N477801
MODEL & SERIAL NO.
ENGINE
VE D12-465 1900RPM
D12*590662*D2*AH
TRANSMISSION
FRO-16210C, 10 SPEE
P0197155
AUX TRANS.
FRONT AXLE - FIRST
12,500 LB FRONT AXL
ARD00108980
FRONT AXLE - SECOND
PUSHER AXLE



MANUFACTURED BY: VOLVO TRUCKS NORTH AMERICA
MONTH AND YEAR OF MANUFACTURE: JUNE 2006
GROSS VEHICLE WEIGHT RATING (KG/LBS): 22,839/ 50,351

GROSS AXLE WEIGHT RATING:	KG/LBS		TIRES	RIMS/WHE
FRONT -	5,601/ 12,350	WITH	295/75R22.5G	22.5X8
1ST INTERMEDIATE AXLE-		WITH		
2ND INTERMEDIATE AXLE-		WITH		
3RD INTERMEDIATE AXLE-		WITH		
REAR (EACH) -	8,618/ 19,000	WITH	295/75R22.5G	22.5
TAG -		WITH		



VOLVO TRUCKS NORTH AMERICA, INC.

VEHICLE NOISE EMISSION CONTROL INFORMATION

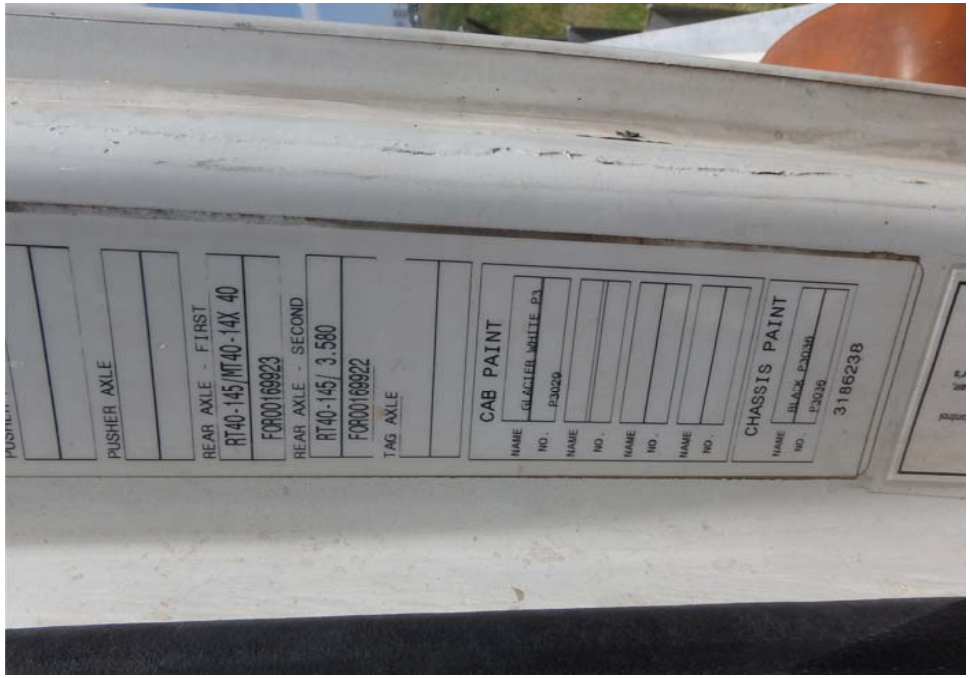
This vehicle Conforms to U.S. EPA Regulations for Noise Emission Applicable to Medium and Heavy Trucks.

The following acts or the causing thereof by any person are prohibited by the Noise Control Act of 1972:

(A) The removal or rendering inoperative, other than for purposes of maintenance, repair, or replacement, of any noise control device or element of design (listed in the owner's manual) incorporated into this vehicle in compliance with the Noise Control Act:

(B) The use of this vehicle after such device or element of design has been removed or rendered inoperative.

Date of Manufacture: JUN 2006 Part No. 20354768



PUSHER AXLE

REAR AXLE - FIRST
RT40-145/MT40-14X 40
FOR00169923

REAR AXLE - SECOND
RT40-145/ 3.580
FOR00169922

TAG AXLE

CAB PAINT
NAME GLACIER WHITE P3
NO. P3029
NAME
NO.
NAME
NO.
NAME
NO.
NAME
NO.

CHASSIS PAINT
NAME BLACK P3039
NO. P3039

3186238

Model:

(COLD INFLATION)
KPA/PSI
758/110

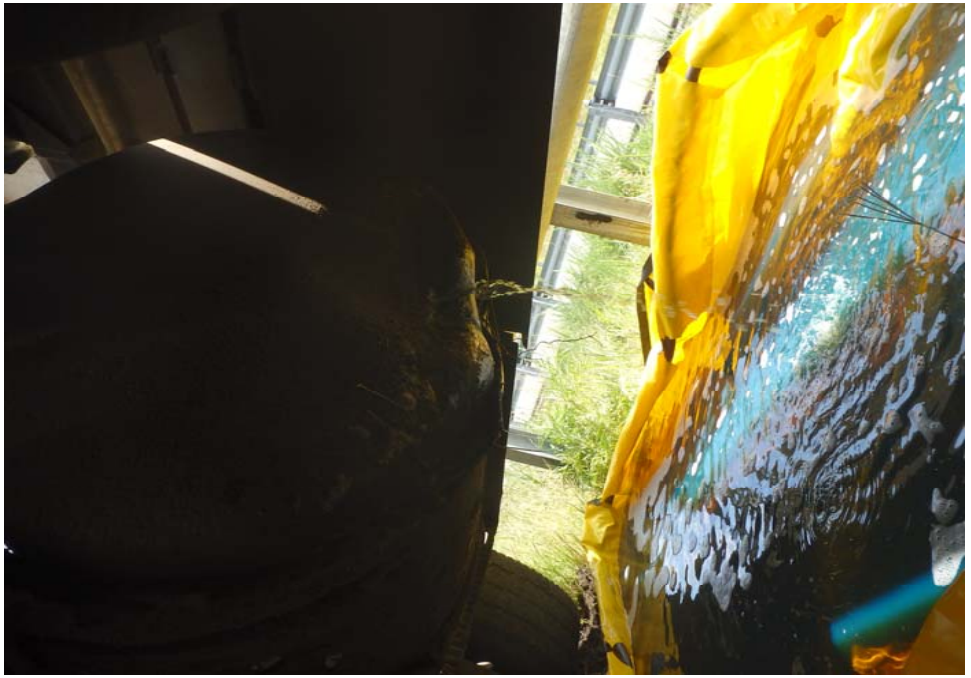
758/110

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S.A. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN 4V4NC9GH77N477801

CLASSIFICATION OF VEHICLE: TRUCK TRACTOR

20377823

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PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: 16111500047036	Date: 11/15/2016
Location:13426 Occoquan Rd	Time: 15:15
Report Completed By: Captain K. Stewart	Incident Commander: n/a
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding: HMO502, Captain Stewart	

INCIDENT DESCRIPTION
I received a phone call from E502 officer, Captain M. Saager, stating that he had observed workers rinsing buckets containing what looked like a tan liquid down the storm drain outside a concrete business. E502 was enroute to an emergency incident so did not stop, but upon the engine's return to the location all was cleaned up and there was no observable material. E502's officer had contacted the duty hazmat tech who referred him to a hazmat officer. I called PSCC and requested an incident be created for an Investigation and to place myself, HMO502 on the call. Upon my arrival at the address I observed what looked like water on the ground with a residual small puddle containing some gray material. I did not observe any product in the storm drain though it was clear that water had flown into the drain. All readings at the storm drain were normal with the exception of the PID which provided a reading of 116 ppb. I used pH paper and tested the water in the puddle and found the water to be slightly basic, approximately 8. I shared my findings with the foreman and he stated that workers had rinsed buckets outside the business but that it was just water. I explained to him that the buckets may have contained residual content that could be harmful to the environment. I pointed out the storm drain and stated that the workers need to know that storm drains are for rain water only and that the business could be held responsible for illicit discharge in the future. I then contacted the business owner at 16:09 and explained the same. Both the foreman and the business owner agreed to speak with the workers and provide environmental training to them.

RESPONSIBLE PARTY	OTHER PARTY
Name: Penny Woodall	Name: Irvin Portillo
Company: Brown's Services, Inc.	Company: Brown's Services, Inc
Address: 13426 Occoquan Rd.	Address: 13426 Occoquan Rd.
Phone#: 571-238-9040	Phone#: 571-233-1438
Notes: Owner	Notes: Foreman

NOTIFICATIONS/CONTACTS	
Date: 11/15/16	Date: 11/15/16
Time: 16:25	Time: 16:30
Name: John	Name: Marc Aveni
Comp/Agency: VA EOC	Comp/Agency: PWC Watershed
Notes: approx. 3-5 gallons water with concrete slurry possibly into storm drain, nothing recoverable.	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
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Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD16113000049188	Date: 11/30/2016
Location:6950 Nova Way	Time: 20:37
Report Completed By: Gonzalez	Incident Commander: Chief Tony Cooch
HM 506 Personnel Responding: McCabe, Weaver, Malone, Waln HS 516 Personnel Responding: Newell, Gonzalez, Sanchez, Mirabile Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
E516, HS516 were dispatched for an inside gas leak at La Quinta Inn. E516 and HS516 AOS and reported to Command BC501. Command stated they had several PTs currently being evaluated by medic units for possible inhalation hazards. While at Command, FF Connor Shiro approached to debrief command and started coughing heavily. He was moved for immediate DECON and while at DECON he began to vomit. E516 crew member hosed FF Connor Shiro off for emergency DECON and transferred him to M511. E516 crew met with Command and HM506 personnel for further briefing and strategy. It was stated that the inhalation hazard was due to occupants of room 102 microwaving a Carolina Reaper hot pepper (World's hottest pepper). E516 Crew made entry into Room 102 for atmospheric monitoring and RECON with HM506 personnel as backup crew. All atmospheric reading levels were normal within the room. E516 Crew found food in the room to correlate with the occupant's story. E516 Crew exited Room 102 and made entry into Room 107 for atmospheric monitoring as well. All reading levels were normal. E516 Crew exited the structure and returned to Command and was later released and placed back in service.

RESPONSIBLE PARTY	OTHER PARTY
Name: La Quinta Inn	Name:
Company: Motel	Company:
Address: 6950 Nova Way	Address:
Phone#: 7033939966	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 11-30-16	Date:
Time: 22:47	Time:
Name: Chris Blake	Name:
Comp/Agency: Va EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM

INCIDENT INFORMATION	
Fire Dept. Incident #: FD17032400011829	Date: 3/24/2017
Location:7486 Stream Walk Way	Time: 1402
Report Completed By: Lt. Shannon	Incident Commander: TII Morris
HM 506 Personnel Responding: Lt. Shannon, TII Snitwongse, TII Hoffman, TI Sawyer HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION
E511 Officer called for a phone consult for a report of someone dumping something in the storm drains in a parking lot. He advised that they have been there about a week and a half ago for the same issue. The strom drain lead to a retension pond on the property where they could see a small area of schene on the water surface. Because this happened prior there were already booms in place around the overflow for the retension pond protecting it from any product if it were to reach the drain. E511's officer advised me that he had sopken with the property owner and that they had already contacted the clean up company. Because they had video of the relese of product FM and PD were there to do the investigation. I advised E511's officer that the correct actions were already in place and that because there were no other waterways that could be affected we would not be responding.

RESPONSIBLE PARTY	OTHER PARTY
Name: John Bowling	Name: Charlie Powers
Company: Acadia Reality Trust	Company: CNF Management Corp/Clean Harbor
Address:	Address:
Phone#: 302-479-5510	Phone#: 516-448-5004
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 03/24/2017	Date: 03/24/2017
Time: 1754	Time: 1400
Name: Archer Stark	Name: Allan Lacy
Comp/Agency: VA EOC	Comp/Agency: DEQ
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

Appendix G – Industrial and High Risk Runoff

GPIN	ST_NO	ST_NAME	ST_TYPE	CITY	ZIP	NAME	PWC_MAP	usecode	use_descri	Use_Probab	owner_cur	BuildingNa
8390-06-4290	15801	NEABSCO	RD	WOODBRIDGE	22191	PWC SERVICE AUTHORITY	8390NW	224	Sewage	2	PWC SERVICE AUTHORITY	MAINT BLDG
8391-59-7928	14227	JEFFERSON DAVIS	HY	WOODBRIDGE	22191	JD HWY LLC	8391NE	361	Motor Vehicle Sales	3	JD HWY LLC	LUSTINE TOYOTA
7697-42-3704	7681	SUDLEY	RD	MANASSAS	20109	BTR MANASSAS INC	7697SW	313	Shopping Center	3	SUDLEY TOWNE PLAZA LLC	SUDLEY TOWNE PLAZA
8192-50-4578	14150	MINNIEVILLE	RD	WOODBRIDGE	22193	MINNIEVILLE PLAZA LTD PTNSHP	8192SE	312	Shopping Center	3	MINNIEVILLE PLAZA LLC	MINNIEVILLE PLAZA
8292-81-3425	14050	TELEGRAPH	RD	WOODBRIDGE	22192	SUSA PARTNERSHIP LP	8292SE	151	Mini Warehousing	3	ESS PRISA LLC	STORAGE USA-BLDG C
8192-50-8821	14119	MINNIEVILLE	RD	WOODBRIDGE	22193	REGENCY REALTY GROUP INC	8192SE	313	Shopping Center	3	SVAP CHESHIRE LP	CHESHIRE W/ PETCO & SAFEWAY
8492-43-4786.01	559	HARBOR SIDE	ST	WOODBRIDGE	22191	MARINA LANDING ASSOCIATES LLC	8492SW	318	Shopping Center	3	MARINA LANDING ASSOCIATES LLC	
8492-43-5380.01	551	HARBOR SIDE	ST	WOODBRIDGE	22191	MARINA LANDING ASSOCIATES LLC	8492SW	318	Shopping Center	3	MARINA LANDING ASSOCIATES LLC	
8492-43-4192.01	567	HARBOR SIDE	ST	WOODBRIDGE	22191	MARINA LANDING ASSOCIATES LLC	8492SW	318	Shopping Center	3	MARINA LANDING ASSOCIATES LLC	
8492-43-3795.01	571	HARBOR SIDE	ST	WOODBRIDGE	22191	MARINA LANDING ASSOCIATES LLC	8492SW	318	Shopping Center	3	MARINA LANDING ASSOCIATES LLC	
8492-43-4489.01	563	HARBOR SIDE	ST	WOODBRIDGE	22191	MARINA LANDING ASSOCIATES LLC	8492SW	318	Shopping Center	3	MARINA LANDING ASSOCIATES LLC	
8492-43-5083.01	555	HARBOR SIDE	ST	WOODBRIDGE	22191	MARINA LANDING ASSOCIATES LLC	8492SW	318	Shopping Center	3	MARINA LANDING ASSOCIATES LLC	
7696-59-1631	8025	SUDLEY	RD	MANASSAS	20109	WESTGATE SHOPPING CENTER LLC	7696NE	311	Small Shopping Center	3	WESTGATE MZL LLC	WESTGATE
7397-28-0270	6876	PIEDMONT CENTER	PZ	GAINESVILLE	20155	PIEDMONT COMMERCIAL CENTER INC	7397NW	311	Small Shopping Center	3	PIEDMONT PLAZA LLC	PIEDMONT CTR Pcl B *see notes
7896-19-8912	8030	CENTREVILLE	RD	MANASSAS	20111	SCHICK RORY LEE	7896NW	216	Auto Parking	3	SCHICK RORY LEE	
8193-19-4944	4650	ASDEE	LN	WOODBRIDGE	22192	OLD HICKORY GOLF CLUB LLC	8193NW	832	Golf Course	2	OLD HICKORY GOLF CLUB LLC	
8292-71-6115	14001	WORTH	AV	WOODBRIDGE	22192	ARI POTOMAC MILLS AND D LLC ETAL	8292SE	312	Shopping Center	3	ALLIANCE HSP POTOMAC MILLS LLC	GANDER MOUNTAIN
7595-57-4944	9435	CONTRACTORS	CT	MANASSAS	20109	SWAN ROBERT E TR	7595NE	150	Wholesale Warehousing	4	GRR LAND OF VIRGINIA LLC	
7497-02-6514.01	7689	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	GATEWAY BUSINESS CENTER	BLDG D UNIT 100
8292-66-4137	13270	MINNIEVILLE	RD	WOODBRIDGE	22192	GARBER PROPERTIES LLC	8292NE	390	Retail	3	GARBER PROPERTIES LLC	Holly Acres Marine
8292-56-8930	2826	GARBER	WY	WOODBRIDGE	22192	MINNIEVILLE ROAD DEVELOPMENT CO LLC	8292NE	311	Small Shopping Center	3	LIBERIA INVESTMENTS LLC	GARBER SHOPPING CENTER
7497-02-7698	5524	WELLINGTON	RD	GAINESVILLE	20155	CRABTREE ROBERT ROSANNA CRABTREE	7497SW	190	Other Industrial	4	FULL OF SUNSHINE LLC	MASTERCRAFT AUTO
7497-23-0068	7300	RAIL LINE	CT	GAINESVILLE	20155	DALRYMPLE REALTY CORPORATION	7497SW	121	Durable Manufacturing	4	DALRYMPLE REALTY CORPORATION	NEWINGTON CONCRETE PLANT
8393-11-3391	12730	HARBOR	DR	WOODBRIDGE	22192	MCDONALDS CORPORATION	8393SW	354	Restaurant	3	MCDONALDS CORPORATION	MCDONALDS- HARBOR
7892-54-6381	13641	DUMFRIES	RD	MANASSAS	20112	VARGAS FERNANDO R & GRACIELLA VARGAS	7892SE	312	Shopping Center	3	VARGAS FERNANDO R & GRACIELLA VARGAS	BRADFORD SQUARE
8192-58-7724	4071	PRINCE WILLIAM	PY	WOODBRIDGE	22193	STOR ALL LIPD LLC	8192NE	151	Mini Warehousing	3	PS WOODBRIDGE PRINCE WILLIAM 2013 LLC	PUBLIC STORAGE A
7397-45-1913	14251	JOHN MARSHALL	HY	GAINESVILLE	20155	CPC GAINESVILLE LLC	7397NW	190	Other Industrial	4	CPC-GAINESVILLE LLC	ATLANTIC COAST COTTON
7595-68-1509	9449	HAWKINS	DR	MANASSAS	20109	ROSS HAROLD M	7595NE	121	Durable Manufacturing	4	ROSS DAVID L	H.M. ROSS PAVING
8192-67-1576	4021	PRINCE WILLIAM	PY	WOODBRIDGE	22192	STEICO INCORPORATED	8192NE	344	Convienience Store with Gas	4	STEICO INCORPORATED	SHEETZ - PW PKWY & HILLENDALE
8192-77-7307	3908	PRINCE WILLIAM	PY	WOODBRIDGE	22192	3908 PRINCE WILLIAM LLC	8192NE	351	Restaurant	3	DJASSEBI JOE MEHRDAD & NORMA ISABEL SURV	JOE'S AMERICAN DINER
7697-33-9426	7500	BROKEN BRANCH	LN	MANASSAS	20109	LOWES HOME CENTERS INC	7697SW	320	Building Materials	3	LOWES HOME CENTERS INC	LOWE'S HOME CENTER
8093-52-8034	5304	HOADLY	RD	MANASSAS	20112	CHRISTOPHER CLAYTON C AND DORIS N	8093SE	911	Agricultural Resources	3	CHRISTOPHER CLAYTON C & DORIS N	
8289-35-3480	17247	WAYSIDE	DR	DUMFRIES	22026	ATLANTIC INVESTMENT CORPORATION	8289NW	311	Small Shopping Center	3	PREMIER SOUTHBRIDGE LLC	
7697-32-9173	7501	BROKEN BRANCH	LN	MANASSAS	20109	GENERAL MILLS RESTAURANTS INC	7697SW	351	Restaurant	3	ARCP RL/OG MANASSAS VA LLC	RED LOBSTER
7696-76-9773	8345	SUDLEY	RD	MANASSAS	20109	MANAPORT PLAZA LLC	7696NE	313	Shopping Center	3	MANAPORT PLAZA LLC	MANAPORT S C
7497-01-6194.01	7689	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	INDIE LLC	BLDG D UNIT 125
7497-02-6302.01	7689	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	GATEWAY BUSINESS CENTER	BLDG D UNIT 120
7497-02-3717.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	BLUE LABEL CUSTOMS LLC	BLDG B UNIT 120
7497-02-2519.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	NATIVE VENTURES LLC	BLDG B UNIT 140
7695-28-5649	10801	UNIVERSITY	BL	MANASSAS	20110	PWC BOARD OF COUNTY SUPERVISORS	7695NW	140	Research and Testing	2	PWC BOARD OF COUNTY SUPERVISORS	AMERICAN TYPE CULTURE (ATCC)
7594-91-5941	11507	VALLEY VIEW	DR	BRISTOW	20136	BRISTOW MANOR PARTNERSHIP	7594SE	832	Golf Course	2	BRISTOW MANOR PARTNERSHIP	Bristow Estates Manor House
8292-55-1036	13356	MINNIEVILLE	RD	WOODBRIDGE	22192	FARM LLC	8292NE	311	Small Shopping Center	3	FARM LLC	SHOPS AT MADISON FARM
7892-55-2432	13550	DUMFRIES	RD	MANASSAS	20112	WOODBINE SHOPPING CENTER ASSOCS LLC	7892NE	313	Shopping Center	3	WOODBINE SHOPPING CENTER ASSOCS LLC	WOODBINE S C
8292-23-8176	13540	MINNIEVILLE	RD	WOODBRIDGE	22192	DOMINION CENTER LLC	8292SW	312	Shopping Center	3	DOMINION CENTER TWO LLC	DOMINION CENTER
8188-64-1129	18638	TRIANGLE	ST	TRIANGLE	22172	CHOI SUNG KUL HAI SUN SURV	8188SE	216	Auto Parking	3	CHOI JASON SUNG KUL TR & HAI SUN	
7794-93-8087	8675	PLANT	PL	MANASSAS	20112	MEADOWS MERLIN GILVEN	7794SE	390	Retail	3	MEADOWS MERLIN W TR & STAN L TR	GIL MEADOWS NURSERIES INC
8090-48-6613	15701	CARRS BROOKE	WY	MANASSAS	20112	EXXON MOBIL CORPORATION	8090NE	344	Convienience Store with Gas	4	MACS RETAIL LLC	CAR WASH
8190-34-9190	4370	KEVIN WALKER	DR	DUMFRIES	22025	MONTCLAIR PLAZA LLC	8190SW	312	Shopping Center	3	MONTCLAIR PLAZA LLC	MONTCLAIR PL I
8193-11-8551	12730	BLACK FOREST	LN	WOODBRIDGE	22192	RENSCHLER ROLF MARGARETE K TRS	8193SW	351	Restaurant	3	RENSCHLER ROLF & MARGARETE K TRS	QUEEN'S GAMBIT
7397-18-6524	14670	GAP	WY	GAINESVILLE	20155	EXXONMOBIL OIL COPORATION	7397NW	311	Small Shopping Center	3	GAP WAY LLC	GREENHILL COMMERCIAL
8289-36-4320	17171	WAYSIDE	DR	DUMFRIES	22026	ATLANTIC INVESTMENT CORPORATION	8289NW	311	Small Shopping Center	3	PREMIER SOUTHBRIDGE LLC	SOUTHBRIDGE PLAZA
8393-12-2614	2201	OLD BRIDGE	RD	WOODBRIDGE	22192	TACKETTS MILL CENTER LLC	8393SW	353	Restaurant	3	TACKETT'S MILL CENTER LLC	Dunkin Donuts
8190-85-7263	15823	LAZY DAY	LN	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NE	832	Golf Course	2	CJ EAGLE LLC	
8188-64-2402	18723	FULLER HEIGHTS	RD	TRIANGLE	22172	HEPBURN ANDREW PHILLIP	8188SE	390	Retail	3	HEPBURN ANDREW PHILLIP	
7493-86-1936	12026	ADEN	RD	NOKESVILLE	20181	COWNE FAMILY LP	7493NE	224	Sewage	2	PWC SERVICE AUTHORITY	
8190-87-4542	3802	DALEBROOK	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NE	832	Golf Course	2	CJ EAGLE LLC	
7299-71-8268	5200	MERCHANTS VIEW	SQ	HAYMARKET	20169	DOMINION COUNTRY CLUB LP	7299SE	311	Small Shopping Center	3	DOMINION VALLEY OWNER LLC	BUILDING ""M""
7497-01-4392.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	GATEWAY BUSINESS CENTER	BLDG C UNIT 140
7497-01-3294.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	GATEWAY BUSINESS CENTER	BLDG C UNIT 125
8492-53-7716	401	BELMONT BAY	DR	WOODBRIDGE	22191	BELMONT BAY LC	8492SE	831	Golf Course	2	BELMONT BAY LC	BELMONT BAY GOLF CLUBHOUSE
7696-86-5847	8441	IRONGATE	WY	MANASSAS	20109	IRONGATE GROUP LLC	7696NE	351	Restaurant	3	IRON GATE GROUP LLC	GUNNI'S RESTAURANT & GRILL
7497-02-4315.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	GATEWAY BUSINESS CENTER	BLDG B UNIT 110
8190-97-0062	3702	DALEBROOK	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NE	832	Golf Course	2	CJ EAGLE LLC	
7497-12-4811	7805	PROGRESS	CT	GAINESVILLE	20155	PLEIN SCOTT AND INGRID SURV	7497SW	150	Wholesale Warehousing	4	PROSPECT COURT LLC	TOTAL DEVELOPMENT SOLUTIONS
8292-34-9675	13430	MINNIEVILLE	RD	WOODBRIDGE	22192	SULLINS THURMAN D TR	8292SW	150	Wholesale Warehousing	4	FORECLOSURE DEVELOPMENT CO LLC	SULLINS FURNITURE
7595-57-4598	9401	CONTRACTORS	CT	MANASSAS	20109	CRONIN DANIEL SHARON CRONIN SURV	7595NE	190	Other Industrial	4	CRONIN DANIEL & SHARON CRONIN SURV	CRONIN FLOORS
8192-57-9857	13131	HILLENDALE	DR	WOODBRIDGE	22193	TRAVERS ROBERT L TR	8192NE	343	Convienience Store	2	TRAVERS ROBERT L TR	7-ELEVEN
8292-82-0694	13798	TELEGRAPH	RD	WOODBRIDGE	22192	SHURGARD FREMONT PARTNERS I	8292SE	151	Mini Warehousing	3	SHURGARD/FREMONT PARTNERS I	SHURGARD STORAGE
8292-82-2050	2600	PRINCE WILLIAM	PY	WOODBRIDGE	22192	MOTIVA ENTERPRISES LLC	8292SE	344	Convienience Store with Gas	4	PMG NORTHERN VIRGINIA LLC	SHELL- PW PKWY & TELEGRAPH RD
8291-65-7904	14700	POTOMAC MILLS	RD	WOODBRIDGE	22192	PWC	8291NE	213	Bus	4	PWC BOARD OF COUNTY SUPERVISORS	PRTC
8292-45-9012	13360	MINNIEVILLE	RD	WOODBRIDGE	22192	PARCEL C2 LLC	8292NE	344	Convienience Store with Gas	4	PARCEL C-2 LLC	7-ELEVEN - MADISON FARM
7397-92-9807.01	7669	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2	GATEWAY BUSINESS CENTER	BLDG A UNIT 115
7497-02-0122.01	7669	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	354	Restaurant	3	S & J ENTERPRISE INC	BLDG A UNIT 110

7994-94-6606	5901	DAVIS FORD	RD	MANASSAS	20112	OCCOQUAN FOREST SANITARY DISTRICT	7994SE	190	Other Industrial	4 PWC SERVICE AUTHORITY	
7697-60-2801	10309	LOMOND	DR	MANASSAS	20109	NORTHERN VIRGINIA ELECTRIC COOP	7697SE	216	Auto Parking	3 NORTHERN VIRGINIA ELECTRIC COOP	
7895-71-8052	10404	MOORE	DR	MANASSAS	20111	MCGARRY ALLAN D & KIL S MCGARRY	7895SE	390	Retail	3 KONDOLOJY ROSTAM	BUCKHALL GENERAL STORE
8292-23-6078	13550	MINNIEVILLE	RD	WOODBRIDGE	22192	DOMINION CENTER LLC	8292SW	312	Shopping Center	3 DOMINION CENTER LLC	DOMINION CENTER - RETAIL
7694-24-6033	11713	BRISTOW	RD	BRISTOW	20136	JOHN RUFF AND PHILLIP WHEELER PTNSHP	7694SW	910	Agricultural Resources	3 BRISTOW BROADRUN LLC	
8492-43-8235	499	HARBOR SIDE	ST	WOODBRIDGE	22191	HARBOR VIEW ASSOCIATES LLC	8492SW	841	Swimming Pool	3 UNIT OWNERS HARBOR VIEW CONDO AT	
8189-69-1607	4100	TALON	DR	DUMFRIES	22025	7 ELEVEN INC	8189NE	344	Convenience Store with Gas	4 SEJ ASSET MANAGEMENT & INVESTMENT CO	7-ELEVEN
7896-18-7963	8104	CENTREVILLE	RD	MANASSAS	20111	RESTLESS WHEELS INC	7896NW	390	Retail	3 RESTLESS WHEELS INC	RESTLESS WHEELS CAMPER SALES
7497-02-2220.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 VG 145 LLC	BLDG B UNIT 145
7497-01-3993.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 135
7497-01-2895.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 120
7497-02-2818.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 FOUR CORNERS REAL ESTATE INVESTMENT GROUP	BLDG B UNIT 135
7496-07-8757	8217	LINTON HALL	RD	BRISTOW	20136	AMERICA ONLINE INC	7496NW	191	Technology Services	1 PORPOISE VENTURES LLC	AOL II
8092-54-6085	13698	MAPLEDALE	AV	WOODBRIDGE	22193	HYLTON CECIL D ESTATE	8092SE	354	Restaurant	3 HYLTON CONRAD C TR & MALCOLM W COOK TR &	MCDONALD'S @ MAPLEDALE
7396-83-1971	13900	ESTATE MANOR	DR	GAINESVILLE	20155	TOWER GROUP LLC	7396SE	311	Small Shopping Center	3 GLENKIRK RETAIL CENTER LLC	FAMILY MART
7696-77-3723	8319	SUDLEY	RD	MANASSAS	20109	MANAPORT PLAZA LLC	7696NE	313	Shopping Center	3 MANAPORT PLAZA LLC	MANAPORT S C
8192-05-3469	4802	DALE	BL	WOODBRIDGE	22193	DELANEY PLAZA LLC	8192NW	312	Shopping Center	3 WOODBRIDGE VILLAGE LLC	DELANEY PLAZA
7595-66-6386	9650	HAWKINS	DR	MANASSAS	20109	NEWBILL HOLDINGS LLC	7595NE	190	Other Industrial	4 ASHLAND INVESTMENTS LLC	NEWBILL HOLDINGS
8193-50-0347	4255	SEETON	SQ	WOODBRIDGE	22192	EXXON CORP	8193SE	344	Convenience Store with Gas	4 SOUTHSIDE OIL LLC	EXXON - THE GLEN SHOP CTR
8292-72-9509	2651	PRINCE WILLIAM	PY	WOODBRIDGE	22192	BRINKER VIRGINIA INC	8292SE	351	Restaurant	3 COLE OB WOODBRIDGE VA LLC	ON THE BORDER
8292-51-4135	13901	SMOKETOWN	RD	WOODBRIDGE	22192	MINI U STORAGE WOODBRIDGE LTD PTNSHP ET	8292SE	151	Mini Warehousing	3 MINI U STORAGE WOODBRIDGE LTD PTNSHP ET AL	MINI-U-STORAGE - OFFICE/APT
8292-23-2492	3340	ELM FARM	RD	WOODBRIDGE	22192	LORD FAIFAX COMMUNITY COLLEGE	8292SW	151	Mini Warehousing	3 POTOMAC MILLS LAND LLLP	EZ SELF STORAGE
8190-62-6732	4202	FORTUNA CENTER	PZ	DUMFRIES	22025	FORTUNA REGENCY LLC	8190SE	313	Shopping Center	3 BRE DDR CROCODILE FORTUNA CENTER LLC	FORTUNA CENTER - SHOPPERS, etc
8393-22-9054	2010	OLD BRIDGE	RD	WOODBRIDGE	22192	BOROCZI SCOTT TR	8393SW	366	Service Station	5 RUBY & HARRY LLC	SUNOCO-OLD BRIDGE & CLIPPER
8292-55-3681	13606	FOWKE	LN	WOODBRIDGE	22192	GARBER J MANLEY JEANETTE ESTATE	8292NE	361	Motor Vehicle Sales	3 GARBER DANIEL C	Lake Ridge Auto Sales
7298-37-4137	5942	INTERLACHEN	CT	HAYMARKET	20169	DOMINION COUNTRY CLUB LP	7298NW	831	Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC	
7298-77-8242	15191	GOLF VIEW	DR	HAYMARKET	20169	DOMINION COUNTRY CLUB LP	7298NE	831	Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC	
7298-79-3018	15201	ARNOLD PALMER	DR	HAYMARKET	20169	DOMINION COUNTRY CLUB LP	7298NE	831	Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC	
7595-57-0682	9400	CONTRACTORS	CT	MANASSAS	20109	L F JENNINGS INC	7595NE	190	Other Industrial	4 L F JENNINGS INC	L F JENNINGS INC
7497-12-2047	7750	PROGRESS	CT	GAINESVILLE	20155	POTOMAC GAINESVILLE PROPERTY LLC	7497SW	160	Industrial Service Garage	4 POTOMAC GAINESVILLE PROPERTY LLC	POTOMAC MACK SALES/SERVICE
8190-66-1721	16500	EDGEWOOD	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NE	832	Golf Course	2 CJ EAGLE LLC	MONTCLAIR COUNTY CLUB
8190-52-9272	4406	FORTUNA CENTER	PZ	DUMFRIES	22025	FORTUNA REGENCY LLC	8190SE	352	Restaurant	3 BRE DDR CROCODILE FORTUNA CENTER LLC	PANERA BREAD & STARBUCKS
8193-40-9299	4350	PRINCE WILLIAM	PY	WOODBRIDGE	22192	LEOPOLD CHARLES W JACQUELINE M SURV	8193SE	190	Other Industrial	4 G & L ENTERPRISES LLC	MAINTENANCE BLDG @ THE GLEN
7696-84-7480	8621	SUNNYGATE	DR	MANASSAS	20109	SUNNYGATE DRIVE SELF STORAGE LLC	7696NE	151	Mini Warehousing	3 U-STORE-IT LP	CUBESMART
7497-24-9109	7201	RAIL LINE	CT	GAINESVILLE	20155	DALRYMPLE REALTY CORP	7497SW	121	Durable Manufacturing	4 DALRYMPLE REALTY CORPORATION	CHEMUNG ASPHALT PLANT
7397-20-9268	7754	VIRGINIA OAKS	DR	GAINESVILLE	20155	NGP REALTY SUB LP	7396SE	832	Golf Course	2 VIRGINIA OAKS LLC	
7595-57-1046	9430	CONTRACTORS	CT	MANASSAS	20109	9430 INC	7595NE	190	Other Industrial	4 9430 INC	A
8492-44-5722	530	HARBOR SIDE	ST	WOODBRIDGE	22191	BELMONT TOWN CENTER ASSOCS LLC	8492NE	851	Marina	3 BELMONT TOWN CENTER ASSOCS LLC	BELMONT BAY CENTER MARINA
7595-67-6742	9489	HAWKINS	DR	MANASSAS	20109	TOUSHA NOBLE A ROBIN	7595NE	150	Wholesale Warehousing	4 TOUSHA NOBLE A & ROBIN	EQUIPMENT SPECIALISTS
8391-88-6685	14398	MELBOURNE	AV	WOODBRIDGE	22191	PWC PARK AUTHORITY	8391NE	224	Sewage	2 PWC BOARD OF COUNTY SUPERVISORS	
7596-24-1508	12021	WILTON MEADOWS	CT	MANASSAS	20109	BENFIELD AND DRESSLER LLC	7596NW	150	Wholesale Warehousing	4 NAGEOTTE RICHARD R V LLC	BENFIELD ELECTRIC
8391-59-8873	14211	JEFFERSON DAVIS	HY	WOODBRIDGE	22191	JD HWY LLC	8391NE	361	Motor Vehicle Sales	3 JD HWY LLC	LUSTINE DODGE - JEEP
7396-59-3972	7689	VIRGINIA OAKS	DR	GAINESVILLE	20155	NGP REALTY SUB LP	7396SE	832	Golf Course	2 VIRGINIA OAKS LLC	
7595-56-9398	11331	INDUSTRIAL	RD	MANASSAS	20109	HUGHES EDDY W	7595NE	150	Wholesale Warehousing	4 DAVID RAMOS FAMILY LLC	MIKE & BRYAN CONTRACTORS
8192-41-7315	4326	DALE	BL	WOODBRIDGE	22193	TRUSTEES OF THE IRENE V HYLTON CHARITABL	8192SW	312	Shopping Center	3 GLENDALE PLAZA LLC	GLENDALE PLAZA
7596-14-5500	8780	VIRGINIA MEADOWS	DR	MANASSAS	20109	PEREIRA ANTONIO AND MARIO RAMOS ETAL	7596NW	190	Other Industrial	4 PEREIRA ANTONIO & MARIO RAMOS ETAL	POTOMAC CONCRETE
7697-50-9508	10319	LOMOND	DR	MANASSAS	20109	NORTHERN VIRGINIA ELECTRIC COOP	7697SE	216	Auto Parking	3 NORTHERN VIRGINIA ELECTRIC COOP	
7595-67-8821	9651	HAWKINS	DR	MANASSAS	20109	HAMP WILLIAM A III TR	7595NE	190	Other Industrial	4 HAWKINS DRIVE LLC	CALVERT MASONRY
7496-50-4931	12912	HUNTING COVE	PL	BRISTOW	20136	BIRCHWOOD AT BRIDLEWOOD MANOR ASSOC LLC	7496SE	841	Swimming Pool	3 BRIDLEWOOD MANOR COMMUNITY ASSN	
7993-01-0402	12805	DUSTY WILLOW	RD	MANASSAS	20112	OAK RIDGE SWIM CLUB INC	7993SW	841	Swimming Pool	3 OAK RIDGE SWIM CLUB INC	
8391-56-6917	1551	FEATHERSTONE	RD	WOODBRIDGE	22191	HALL MICHAEL T TR	8391NE	343	Convenience Store	2 THE KENTLAND FOUNDATION INC	7 MARKET FOOD STORE
8193-37-0594	4600	ASDEE	LN	WOODBRIDGE	22192	OLD HICKORY GOLF CLUB LLC	8193NW	832	Golf Course	2 OLD HICKORY GOLF CLUB LLC	OLD HICKORY GOLF CLUB STOR/BAT
7497-02-0329.01	7669	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 TEAMC PROPERTIES LLC	BLDG A UNIT 100
8293-04-3660	3310	OLD BRIDGE	RD	WOODBRIDGE	22192	OLD BRIDGE RETAIL INVESTMENTS LLC	8293SW	313	Shopping Center	3 OLD BRIDGE RETAIL INVESTMENTS LLC	FESTIVAL-OLD BRIDGE
7497-01-6089.01	7689	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 DLE LLC	BLDG D UNIT 135
7497-01-3594.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 130
7497-01-1299.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 100
7497-02-3417.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG B UNIT 120
8391-58-3691	14335	JEFFERSON DAVIS	HY	WOODBRIDGE	22191	LYNWOOD SHOPPING CENTER LLC	8391NE	312	Shopping Center	3 LYNWOOD SHOPPING CENTER LLC	LYNWOOD SHOPPING CENTER
8193-93-5944	3514	OLD BRIDGE	RD	WOODBRIDGE	22192	EXXON CORP	8193SE	344	Convenience Store with Gas	4 SOUTHSIDE OIL LLC	EXXON-OLD BRIDGE & SMOKETOWN
8293-04-2352	3312	OLD BRIDGE	RD	WOODBRIDGE	22192	OLD BRIDGE RETAIL INVESTMENTS LLC	8293SW	313	Shopping Center	3 OLD BRIDGE RETAIL INVESTMENTS LLC	FESTIVAL-OLD BRIDGE FOOD LION
8191-35-7187	14797	DARBYDALE	AV	WOODBRIDGE	22193	TRAVERS ROBERT L TR	8191NW	343	Convenience Store	2 TRAVERS ROBERT L TR	7-ELEVEN
8293-03-0262	3318	OLD BRIDGE	RD	WOODBRIDGE	22192	STORAGE SQUIREBAC 101 LTD PTNSHP	8293SW	151	Mini Warehousing	3 STORAGE SQUIREBAC 101 LTD PTNSHP	STORAGE USE - BLDG D
8292-88-9614	13059	MINNIEVILLE	RD	WOODBRIDGE	22192	ARCHIE HENRY E SR & ANNIE WILLIAMS	8292NE	369	Other Automotive	4 ARCHIE HENRY ELVIN JR	Penny's Used Auto Parts
8193-93-0718	12576	GRAND TARGHEE	DR	WOODBRIDGE	22192	AMOCO OIL CO	8193SE	344	Convenience Store with Gas	4 OLD BRIDGE 101 LLC	Car Wash
8293-05-8957	3500	COMMISSION	CT	WOODBRIDGE	22192	COMMISSION COURT LLC	8293NW	151	Mini Warehousing	3 COMMISSION COURT LLC	ATLANTIC STORAGE
8193-92-0448	3705	OLD BRIDGE	RD	WOODBRIDGE	22192	MICHAEL R VANDERPOOL ET ALL	8193SE	390	Retail	3 JVG LLC	LOW ROOFED GREENHOUSE
7595-68-5645	11141	INDUSTRIAL	RD	MANASSAS	20109	S S REAL ESTATE HOLDINGS L L C	7595NE	150	Wholesale Warehousing	4 11141 INDUSTRIAL ROAD LLC	S & S REAL ESTATE
8392-88-5002	13244	PUTNAM	CL	WOODBRIDGE	22191	GREENWICH HILL HOMEOWNERS ASSOC	8392NE	841	Swimming Pool	3 GREENWICH HILL HOMEOWNERS ASSOC	
8292-80-9997	14103	TELEGRAPH	RD	WOODBRIDGE	22192	HAMILTON C ISAAC TR & JUDITH TR	8292SE	131	NonDurable Manufacturing	4 TELEGRAPH MANAGEMENT GROUP LLC	HAMILTON IRON WORKS
8292-51-2288	13889	SMOKETOWN	RD	WOODBRIDGE	22192	PUBLIC STORAGE INC	8292SE	151	Mini Warehousing	3 PUBLIC STORAGE INC	PUBLIC STORAGE BLDG A
8391-82-5162	15060	FARM CREEK	DR	WOODBRIDGE	22191	TRIDEX ASSOCIATES INC	8391SE	150	Wholesale Warehousing	4 TRIDEX ASSOCIATES INC	TRIDEX MACHINE SHOP/WAREHOUSE
8193-30-7146	4383	RIDGEWOOD CENTER	DR	WOODBRIDGE	22192	PFITZNER G RICHARD TR	8193SW	216	Auto Parking	3 PFITZNER G RICHARD TR	
7595-58-6956	11250	INDUSTRIAL	RD	MANASSAS	20109	KALOS PETER VERON L KALOS	7595NE	190	Other Industrial	4 COSTA ENTERPRISES LLC	

8393-11-6795	12721	HARBOR	DR	WOODBRIDGE	22192	TACO BELL OF AMERICA INC	8393SW	354	Restaurant	3 TACO BELL OF AMERICA INC	TACO BELL
7896-19-9330	8028	CENTREVILLE	RD	MANASSAS	20111	AKSOYLU AHMET	7896NW	150	Wholesale Warehousing	4 AKSOYLU AHMET	VAMAC PLUMBING SUPPLIES
8392-51-7103	1641	WIGGLESWORTH	WY	WOODBRIDGE	22191	PEP BOYS MANNY MOE JACK	8392SE	369	Other Automotive	4 PEP BOYS MANNY MOE & JACK	Pep Boys
8292-83-0326	13790	TELEGRAPH	RD	WOODBRIDGE	22192	PASCAVAGE JOAN	8292SE	150	Wholesale Warehousing	4 PERRY FAMILY LIMITED PARTNERSHIP LLP	AIRECO, VAMAC, JACKSON TRANSPO
8292-90-3172	14105	TELEGRAPH	RD	WOODBRIDGE	22192	HARRISON KIMBERLY C STEVEN H	8292SE	369	Other Automotive	4 VROOM VROOM HOLDINGS LLC	COLEMAN POWERSPORT
8292-23-4763	13598	MINNIEVILLE	RD	WOODBRIDGE	22192	DOMINION CENTER LLC	8292SW	312	Shopping Center	3 DOMINION CENTER TWO LLC	DOMINION CENTER - RETAIL
8292-72-9845	2630	PRINCE WILLIAM	PY	WOODBRIDGE	22192	EKW ENTERPRISES LLC	8292SE	351	Restaurant	3 HO AMY Y & JAMES HO ETAL T-C	HOOTERS
8292-82-6528	2631	PRINCE WILLIAM	PY	WOODBRIDGE	22192	JBAC L L C	8292SE	344	Convienience Store with Gas	4 JBAC L L C	7-ELEVEN
7497-01-2097.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 110
7497-01-1698.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 105
7497-02-4714.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG B UNIT 105
7497-02-4016.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG B UNIT 115
7497-02-3118.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG B UNIT 130
7497-01-5983.01	7689	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG D UNIT 140
8191-94-0237	14820	CLOVERDALE	RD	WOODBRIDGE	22193	TRAVERS ROBERT L TR	8191SE	343	Convienience Store	2 TRAVERS ROBERT L TR	7-ELEVEN
7595-67-5757	9479	HAWKINS	DR	MANASSAS	20109	HAWKINS ROAD ASSOCIATES LLC	7595NE	150	Wholesale Warehousing	4 DOBYNS PROPERTIES LLC	DOBYN'S CONSTRUCTION
7596-14-7467	8713	VIRGINIA MEADOWS	DR	MANASSAS	20109	GRC LLC	7596NW	150	Wholesale Warehousing	4 GRC LLC	COASTAL ELECTRIC
7497-02-0225.01	7669	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	
7596-13-8198	8760	VIRGINIA MEADOWS	DR	MANASSAS	20109	AMERICAN MANAGEMENT ENTERPRISES	7596SW	150	Wholesale Warehousing	4 8760 LLC	Helpcomm, Inc.
8392-29-7921	13065	LUPINE	TN	WOODBRIDGE	22192	PWC BOARD OF COUNTY SUPERVISORS	8392NW	224	Sewage	2 PWC BOARD OF COUNTY SUPERVISORS	SEWAGE PUMPING STATION
7991-05-2666	14823	DUMFRIES	RD	MANASSAS	20112	VENABLE JEAN S	7991NW	369	Other Automotive	4 KELLY SCOTT D	ASAP AUTO RECYCLING CENTER
8393-11-6935	2211	TACKETTS MILL	DR	WOODBRIDGE	22192	DOMINION FOODS LTD	8393SW	354	Restaurant	3 BRC TACKETTS MILL LAND LLC	BURGER KING
8289-36-2339	17165	WAYSIDE	DR	DUMFRIES	22026	ATLANTIC INVESTMENT CORPORATION	8289NW	311	Small Shopping Center	3 PREMIER SOUTHBRIDGE LLC	AUTO ZONE
8292-82-5976	13851	TELEGRAPH	RD	WOODBRIDGE	22192	PARKWAY CROSSING LLC	8292SE	150	Wholesale Warehousing	4 PARKWAY CROSSING LLC	P.W. COUNTY ARCHIVES
8190-45-6117	4413	ASHGROVE	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NW	832	Golf Course	2 CJ EAGLE LLC	
8193-50-7773	13211	TOUCHSTONE	CL	WOODBRIDGE	22192	SAUL HOLDINGS LIMITED PARTNERSHIP	8193SE	311	Small Shopping Center	3 SAUL HOLDINGS LIMITED PARTNERSHIP	THE GLEN
7497-02-1720.01	7679	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG B UNIT 150
8190-66-9015	16066	DEER PARK	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NE	832	Golf Course	2 CJ EAGLE LLC	
8293-25-1320	12241	HEDGES RUN	DR	WOODBRIDGE	22192	LAKE RIDGE E AND A LLC	8293NW	311	Small Shopping Center	3 LAKE RIDGE (E&A) LLC	GIANT'S HEDGES RUN/LAKE RIDGE
8190-39-3819	15516	GOLF CLUB	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NW	832	Golf Course	2 CJ EAGLE LLC	
8190-35-4496	4412	ASHGROVE	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NW	832	Golf Course	2 CJ EAGLE LLC	
8190-54-0778	16225	EDGEWOOD	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190SE	832	Golf Course	2 CJ EAGLE LLC	
8190-77-2247	15870	NORTHGATE	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NE	832	Golf Course	2 CJ EAGLE LLC	
7595-56-7123	9515	CONTRACTORS	CT	MANASSAS	20109	BROAD RUN DEVELOPMENT LLC	7595NE	190	Other Industrial	4 EURO GROUP LLC	
8193-50-3541	13261	TOUCHSTONE	CL	WOODBRIDGE	22192	MCDONALDS CORPORATION	8193SE	354	Restaurant	3 MCDONALDS CORPORATION	MCDONALD'S
7497-01-2496.01	7699	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG C UNIT 115
7497-02-6408.01	7689	LIMESTONE	DR	GAINESVILLE	20155	GATEWAY BUSINESS CENTER LP	7497SW	156	Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER	BLDG D UNIT 110
7299-40-8683	15251	WEISKOPF	CT	HAYMARKET	20169	DOMINION VALLEY COUNTRY CLUB LP	7299SW	831	Golf Course	2 THE REGENCY GOLF CLUB I LLC	
8190-46-3671	15915	DOLPHIN	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NW	832	Golf Course	2 CJ EAGLE LLC	
8090-96-0386	5055	WATERWAY	DR	DUMFRIES	22025	E&A ACQUISITION LTD PTSHP	8090NE	313	Shopping Center	3 LAKE MONTCLAIR-DUMFRIES VA LLC	LAKE MONTCLAIR SHOPPING CENTER
8190-48-2675	15601	RHAME	DR	DUMFRIES	22025	U S GOLF PROPERTIES L P	8190NW	832	Golf Course	2 CJ EAGLE LLC	
8292-60-8719	2850	POTOMAC MILLS	CL	WOODBRIDGE	22192	BURLINGTON COAT REALTY POTOMAC INC	8292SE	314	Large Mall	3 BURLINGTON COAT REALTY POTOMAC INC	POTOMAC MILLS-BURLINGTON COAT
7696-76-6475	8375	SUDLEY	RD	MANASSAS	20109	PADILLA LOUIS A CHARLOTTE M	7696NE	344	Convienience Store with Gas	4 PADILLA LOUIS A & CHARLOTTE M	7-ELEVEN
7794-18-3364	10501	CEDAR CREEK	DR	MANASSAS	20112	COUNTRY ROADS HOMEOWNERS ASSOC	7794NW	841	Swimming Pool	3 COUNTRY ROADS HOMEOWNERS ASSOC	
7992-89-0253	7001	DALE	BL	WOODBRIDGE	22193	7 ELEVEN INC	7992NE	344	Convienience Store with Gas	4 SEJ ASSET MANAGEMENT & INVESTMENT CO	7-ELEVEN
7797-53-8297	7420	BEN LOMOND PARK	DR	MANASSAS	20109	UPPER OCCOQUAN SEWAGE AUTHORITY	7797SE	224	Sewage	2 UPPER OCCOQUAN SEWAGE AUTHORITY	SEWAGE TREATMENT/NOVEC
8292-82-1711	2641	PRINCE WILLIAM	PY	WOODBRIDGE	22192	BRINKER VIRGINIA INC	8292SE	351	Restaurant	3 BARBERS LLC	MACARONI GRILL
7596-24-0125	8740	VIRGINIA MEADOWS	DR	MANASSAS	20109	BENFIELD AND DRESSLER LLC	7596NW	190	Other Industrial	4 BENFIELD & DRESSLER LLC	PERMNT SEAL, BENEFIELD ELECTRC
7497-13-3145	5579	WELLINGTON	RD	GAINESVILLE	20155	PRESIDENTIAL PROPERTIES USA LLC	7497SW	151	Mini Warehousing	3 PRESIDENTIAL PROPERTIES USA LLC	PRESIDENTIAL STORAGE
7196-84-1142	8230	BUCKLAND MILL	RD	GAINESVILLE	20155	BUCKLAND FARM LLC	7196SE	911	Agricultural Resources	3 BUCKLAND FARM LLC	
7896-18-5692	8100	CENTREVILLE	RD	MANASSAS	20111	SCHICK RORY LEE	7896NW	361	Motor Vehicle Sales	3 SCHICK RORY LEE	MANASSAS CHRYSLER
7497-02-1157	7645	LIMESTONE	DR	GAINESVILLE	20155	PROSPERITY INVESTORS LLC	7497SW	150	Wholesale Warehousing	4 PROSPERITY INVESTORS LLC	UNITED STATES POSTAL SERVICE
8393-10-4281	12831	HARBOR	DR	WOODBRIDGE	22192	KIM HAK K OK J	8393SW	369	Other Automotive	4 SHAD HOLDING LLC	TACKETTS MILL CAR WASH
7296-19-8769	15694	LEE	HY	GAINESVILLE	20155	STRINGER RODNEY B AND CORA R A SURV	7296NW	351	Restaurant	3 STRINGER INVESTMENT GROUP LLLP	BLUE RIDGE SEA FOOD RESTAURANT
7397-43-5429	7500	ALEXANDER SOPHIA	CT	GAINESVILLE	20155	GAINESVILLE 29 LLC	7397SW	150	Wholesale Warehousing	4 CRAIG ENTERPRISES LLC	
7696-49-6563	8001	SUDLEY	RD	MANASSAS	20109	EXXON CORP	7696SW	344	Convienience Store with Gas	4 MACS RETAIL LLC	EXXON
7595-68-8696	11128	INDUSTRIAL	RD	MANASSAS	20109	WISE GUYS CONTRACTING INC	7595NE	121	Durable Manufacturing	4 INDUSTRIAL ROAD REALTY LLC	WISE GUYS CONSTRUCTION
8390-30-3120	16656	RADCLIFFE	LN	WOODBRIDGE	22191	PWC SERVICE AUTHORITY	8390SW	224	Sewage	2 PWC SERVICE AUTHORITY	SEWAGE PUMP STATION
8289-49-8567	16555	RIVER RIDGE	BL	WOODBRIDGE	22191	LSB WHEATON LLC KODIAK RIVER OAKS LLC	8289NE	311	Small Shopping Center	3 LSB WHEATON LLC & KODIAK RIVER OAKS LLC	RIVER OAKS SC
7599-33-0540	5003	SUDLEY	RD	CATHARPIN	20143	POAGUE JOHN R	7599SW	390	Retail	3 POAGUE JOHN R & JEAN C SURV	SUDLEY GARDEN CENTER
7595-78-1595	11120	INDUSTRIAL	RD	MANASSAS	20109	PAVONE VINCENT F CHARLOTTE C	7595NE	150	Wholesale Warehousing	4 11120 LLC	V.F. PAVONE
7991-25-7431	7044	COLCHESTER PARK	DR	MANASSAS	20112	RIDGE LONG LTD CO	7991NW	150	Wholesale Warehousing	4 L & R REAL ESTATE LLC	RIDGE AND LONG LIMITED LLC
8191-22-5293	3541	WATERWAY	DR	WOODBRIDGE	22193	KEENE MILL CORP	8191SW	312	Shopping Center	3 AHNS REAL ESTATE INC & HEI SIL AHN	MONTCLAIR
7396-59-8754	7950	VIRGINIA OAKS	DR	GAINESVILLE	20155	NGP REALTY SUB LP	7396NE	832	Golf Course	2 VIRGINIA OAKS LLC	VIRGINIA OAKS CLUBHOUSE
8190-44-1875	16160	COUNTRY CLUB	DR	DUMFRIES	22025	SOUTHLAND CORP	8190NE	312	Shopping Center	3 SOUTHLAND CORP	MONTCLAIR 7-11
8193-50-0968	4245	SEETON	SQ	WOODBRIDGE	22192	BNE LLC	8193SE	369	Other Automotive	4 BNE LLC	Lakeridge Auto Care
7298-71-0059	6450	TRADING	SQ	HAYMARKET	20169	HAYMARKET E A LLC	7298SE	313	Shopping Center	3 HAYMARKET (E&A) LLC	BUILDING 4
7298-56-1368	5943	INTERLACHEN	CT	HAYMARKET	20169	DOMINION COUNTRY CLUB LP	7298NE	831	Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC	
8192-67-9463	13295	TROWBRIDGE	DR	WOODBRIDGE	22192	PW PETROLEUM INC	8192NE	344	Convienience Store with Gas	4 PW PETROLEUM INC	VALERO PW PARKWAY
7594-17-9564	12108	NOKESVILLE	RD	BRISTOW	20136	NOKESVILLE LIVESTOCK AUCTION INC	7594NW	390	Retail	3 NOKESVILLE LIVESTOCK AUCTION INC	
7595-31-6547	10500	BRISTOW CENTER	DR	BRISTOW	20136	BLJV	7595SW	311	Small Shopping Center	3 BLJV LLC	BLDG C 10410-10418 BRISTOW CTR
7296-49-9598	7900	STONEWALL SHOPS	SQ	GAINESVILLE	20155	STONEWALL REGENCY LLC	7297SW	313	Shopping Center	3 STONEWALL REGENCY LLC	
7296-68-0445	15601	TURTLE POINT	DR	GAINESVILLE	20155	LAKE MANASSAS LIMITED LIABILITY CO	7296NE	832	Golf Course	2 STONEWALL GOLF CLUB AT LAKE MANASSAS INC	STONEWALL GOLF/CLUBHOUSE
8292-60-5581	14050	WORTH	AV	WOODBRIDGE	22192	SAMS REAL ESTATE BUSINESS TRUST	8292SE	390	Retail	3 SAMS REAL ESTATE BUSINESS TRUST	SAM'S CLUB GAS

7896-17-1798	8501	MAPLEWOOD	DR	MANASSAS	20111	BEATTY FAMILY LP	7896NW	216	Auto Parking	3 BEATTY FAMILY L P	
8393-01-9573	2219	OLD BRIDGE	RD	WOODBRIDGE	22192	TACKETTS MILL CENTER LLC	8393SW	311	Small Shopping Center	3 TACKETT'S MILL CENTER LLC	TACKETTS MILL
7697-14-7746	7651	STREAM WALK	LN	MANASSAS	20109	E A SOUTHEAST LTD PTNSHP	7697NW	313	Shopping Center	3 AMCB MANASSAS PROMENADE LLC	MANASSAS PROMENADE
8291-58-4206	14142	SMOKETOWN	RD	WOODBRIDGE	22192	PRINCE WILLIAM SQUARE INVESTORS LLC	8291NE	313	Shopping Center	3 PRINCE WILLIAM SQUARE INVESTORS LLC	PW SQUARE
8392-05-3846	13455	TELEGRAPH	RD	WOODBRIDGE	22192	PWC BOARD OF COUNTY SUPERVISORS	8392NW	216	Auto Parking	3 PWC BOARD OF COUNTY SUPERVISORS	
8392-87-7647	13249	OCCOQUAN	RD	WOODBRIDGE	22191	AMETHYST COMPANY LLC	8392NE	311	Small Shopping Center	3 AMETHYST COMPANY LLC	WOODBRIDGE SQUARE
7300-54-9159	14050	SHELTER	LN	HAYMARKET	20169	LATHAM CARROLL H AND MARY ANNE L	7300SE	911	Agricultural Resources	3 LATHAM FAMILY LAND LLC	
8192-40-8479	4300	DALE	BL	WOODBRIDGE	22193	TRUSTEES OF THE IRENE V HYLTON CHARITABL	8192SW	351	Restaurant	3 GLENDALE PLAZA LLC	PIZZA HUT
8393-11-8693	12700	MINNIEVILLE	RD	WOODBRIDGE	22192	EXXON CORPORATION	8393SW	344	Convienience Store with Gas	4 SOUTHSIDE OIL LLC	CAR WASH
7595-83-2458	10040	SOWDER VILLAGE	SQ	MANASSAS	20109	INNOVATION E AND A LLC	7595SE	313	Shopping Center	3 INNOVATION (E&A) LLC	RED ROBIN
7595-46-9946	9480	CONTRACTORS	CT	MANASSAS	20109	BROAD RUN DEVELOPMENT LLC	7595NE	190	Other Industrial	4 TRANSATLANTIC REALTY LLC	INDUSTRIAL SHELL
7595-56-3112	9520	CONTRACTORS	CT	MANASSAS	20109	BROAD RUN DEVELOPMENT LLC	7595NE	190	Other Industrial	4 FMJS COMMERCIAL PROPERTIES LLC	BROAD RUN BUSINESS
8191-59-7049	4176	DALE	BL	WOODBRIDGE	22193	TRUSTEES OF THE IRENE V HYLTON CHARITABL	8191NE	312	Shopping Center	3 FORESTDALE PLAZA LLC	FORESTDALE PLAZA
8092-43-9145	5301	DALE	BL	WOODBRIDGE	22193	PWC PARK AUTHORITY	8092SW	841	Swimming Pool	3 PWC BOARD OF COUNTY SUPERVISORS	DALE CITY
8292-70-7645	2860	POTOMAC MILLS	CL	WOODBRIDGE	22192	POTOMAC MILLS OPERATING CO LLC	8292SE	315	Large Mall	3 MALL AT POTOMAC MILLS LLC	POTOMAC MILLS PHASE 3
8292-70-0588	14070	WORTH	AV	WOODBRIDGE	22192	RED ROBIN INTERNATIONAL INC	8292SE	351	Restaurant	3 RED ROBIN INTERNATIONAL INC	RED ROBIN
8291-79-1954	2700	POTOMAC MILLS	CL	WOODBRIDGE	22192	POTOMAC MILLS OPERATING CO LLC	8291NE	315	Large Mall	3 MALL AT POTOMAC MILLS LLC	POTOMAC MILLS I&II
8091-45-7860	14640	MINNIEVILLE	RD	WOODBRIDGE	22193	ZP NO 44 LLC	8091NW	311	Small Shopping Center	3 ZP NO. 44 LLC	STAPLES MILL SC
7896-16-8253	8391	CENTREVILLE	RD	MANASSAS	20111	ABDI PARVIZ AND MAHBOUBEH SAEEDI	7896NW	390	Retail	3 8391 CENTERVILLE ROAD LLC	CARPET GALLERY
7495-77-7361	12691	BRAEMAR VILLAGE	PZ	BRISTOW	20136	BRAEMAR SHOPPING CENTER LLC	7495NE	311	Small Shopping Center	3 CAR BRAEMAR VILLAGE LLC	BRAEMAR SHOPPING CTR
8293-04-2120	3314	OLD BRIDGE	RD	WOODBRIDGE	22192	OLD BRIDGE RETAIL INVESTMENTS LLC	8293SW	313	Shopping Center	3 OLD BRIDGE RETAIL INVESTMENTS LLC	FESTIVAL AT OLD BRIDGE
7696-30-1623	10850	PYRAMID	PL	MANASSAS	20110	ARE VIRGINIA NO 2 LLC	7696SW	140	Research and Testing	2 COMMONWEALTH OF VA DEPT OF FORENSIC SCIENCE	VIRGINIA FORENSICS LAB
7496-60-1866	9100	DEVLIN	RD	BRISTOW	20136	BRISTOW COMMONS LLC	7496SE	313	Shopping Center	3 BC PLAZA LLC	Building 3
7497-12-0220	7800	PROGRESS	CT	GAINESVILLE	20155	WMB LC	7497SW	190	Other Industrial	4 WMB LC	BERGER BUILDING
8093-72-2873	12601	GALVESTON	CT	MANASSAS	20112	HOADLY REGENCY LLC	8093SE	311	Small Shopping Center	3 HOADLY REGENCY LLC	HARRIS TEETER
7296-19-0372	7900	CRESCENT PARK	DR	GAINESVILLE	20155	MADISON CRESCENT RETAIL LLC	7296NW	313	Shopping Center	3 MADISON CRESCENT RETAIL LLC	MADISON CRESCENT BUILDING B
7595-58-7311	11301	INDUSTRIAL	RD	MANASSAS	20109	TECHNOLOGY LEASING CONSULTANTS INC	7595NE	190	Other Industrial	4 TECHNOLOGY & LEASING CONSULTANTS INC	ACUITY AUDIO VISUAL
8291-94-2928	2401	OPITZ	BL	WOODBRIDGE	22191	DIAMOND POTOMAC TOWN CENTER LLC	8291SE	314	Large Mall	3 DIAMOND POTOMAC TOWN CENTER LLC	BLDG 1 - EYE DOCTOR
8393-23-6788	12500	CLIPPER	DR	WOODBRIDGE	22192	THOUSAND OAKS TOWNHOUSE ASSOC	8393SW	841	Swimming Pool	3 THOUSAND OAKS TOWNHOUSE ASSOC	COMMUNITY POOL
7696-85-6632	8500	SUDLEY	RD	MANASSAS	20109	ABEL FAMILY LTD PARTNERSHIP LLP	7696NE	361	Motor Vehicle Sales	3 ABEL FAMILY LIMITED PARTNERSHIP LLP	MILLER TOYOTA
7497-12-6630	7755	PROGRESS	CT	GAINESVILLE	20155	BILLYS LLC	7497SW	190	Other Industrial	4 PROGRESS COURT LLC	FANNON OIL
8391-51-7302	1851	RIPPON	BL	WOODBRIDGE	22191	PWC SERVICE AUTHORITY	8391SE	224	Sewage	2 PWC SERVICE AUTHORITY	H.L. MOONEY
8292-34-8341	13470	MINNIEVILLE	RD	WOODBRIDGE	22192	SOLANO NELIDA & ITALO F TRS	8292SW	352	Restaurant	3 SOLANO NELIDA J & ITALO F SOLANO TRS	EL POLLO RICO
8191-06-5175	14410	MINNIEVILLE	RD	WOODBRIDGE	22193	TRAVERS GUY CHRISTOPHER	8191NW	343	Convienience Store	2 TRAVERS GUY CHRISTOPHER	7-ELEVEN
8093-73-7672	5019	DAVIS FORD	RD	WOODBRIDGE	22192	CREST LIMITED PARTNERSHIP	8093SE	150	Wholesale Warehousing	4 CREST LIMITED PARTNERSHIP	PALM POOLS

FID	STRUC_ID	OUTFALL
41	21270	24
158	21517	15
534	20186	30
536	20188	24
652	19942	36
655	19950	24
818	20789	15
827	17878	0
852	30228	15
1059	18570	21
1065	18576	12
1070	18588	36
1075	18593	27
1630	16261	30
1886	15542	0
1944	14926	0
2176	15305	15
2570	32176	18
2756	11631	0
2764	12308	0
2798	12353	21
2800	12355	15
3013	60379	36
3301	11361	18
3304	11366	8
3382	11707	15
3561	27032	0
3682	4722	15
3683	4724	18
3947	9761	15
3969	9843	15
3972	10321	36
3973	10322	0
3974	10323	36
3975	10324	0
3976	10325	12
3978	10327	30
4101	10033	48
4186	9482	42
4789	2279	228
5004	36226	18
5007	34453	24
5662	36869	24
5671	36828	15
6267	37801	0
6291	37374	24

6426	27777	0
6543	36874	15
6545	37690	27
6565	37660	15
6848	8399	15
7291	32345	15
7369	61713	0
7378	61717	0
7426	61707	0
7430	61711	0
8067	956	0
8457	4429	36
8932	35986	42
8937	36087	24
8939	36069	18
8966	35934	0
8974	35905	21
9532	2295	15
9533	2311	24
9620	30650	66
9696	37976	15
9740	37973	0
9741	18854	0
9807	30709	0
9818	30720	60
9890	25177	15
9899	25199	36
10012	38703	0
10047	37974	15
10056	37986	15
10145	40728	0
10146	40729	15
10267	31940	0
10268	31942	0
10372	39737	18
10376	39743	15
10381	40742	36
10412	14975	36
10476	25755	0
10538	26012	0
10539	26014	0
10540	26017	0
10593	33082	48
10623	39748	15
10632	39699	18
10637	39753	15
10639	39705	15

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10876	34159	41
10877	34163	42
10970	39722	15
11006	39413	15
11164	26774	42
11165	26776	36
11439	26876	0
11555	41239	48
11811	36824	42
12124	36793	15
12413	28284	60
12445	39375	24
12457	37980	12
12786	37964	15
12794	19553	0
12805	34733	0
12811	37975	0
12970	23443	36
13366	39287	36
13611	24019	36
13731	38247	21
13894	2394	18
14069	19554	15
14268	30155	42
14565	51105	30
14799	7558	18
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15379	19946	18
15397	11488	0
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15420	4368	0
15429	4437	18
15434	4457	0
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15874	13639	48
15888	13580	15
15933	26655	135
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16199	13813	15
16225	30625	0
16226	30626	80
16594	9759	21
16618	9795	33

16619	9797	15
16650	9871	42
16658	9882	21
16668	9874	15
16800	27474	23
17106	41551	0
17526	9465	21
17845	8397	15
18366	21282	36
18513	16264	0
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18518	16272	30
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19854	38615	42
20770	34735	0
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20807	38073	21
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21686	35932	18
21688	35896	21
21698	39443	15
21803	46092	0
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21940	36025	15
21950	35901	18
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21964	36061	24
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22267	36341	18
22356	39906	15
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25545	42090	30
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26388	34161	18
26463	42330	42
26468	42335	18
26481	42348	21
26490	42357	24
26567	25183	24
26568	25185	36
26633	10042	84
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26655	10051	0
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27013	35489	15
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27530	26018	36
27542	971	84
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30552	22376	24
30733	14388	24
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31545	45846	0

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32082	19809	30
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32822	42565	36
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33111	45341	0
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46945	28197	48
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54351	5280	21
54499	55102	24
54502	55105	0
54505	55109	54
54509	55113	18
54513	55117	18
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57527	58076	15
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58537	59734	36
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58736	60935	24
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58853	59055	0
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58954	26038	15
58981	26054	0
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59587	46351	18
59971	55000	0
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60193	26103	12
60194	26104	0
60196	26106	15
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60535	64179	27
60536	64180	24
60537	64181	21
60709	27141	48
60735	63043	54
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61543	62841	24
61788	62906	54
62021	62984	54
62036	62994	30
62396	8565	15
62877	14650	18
63079	63185	36
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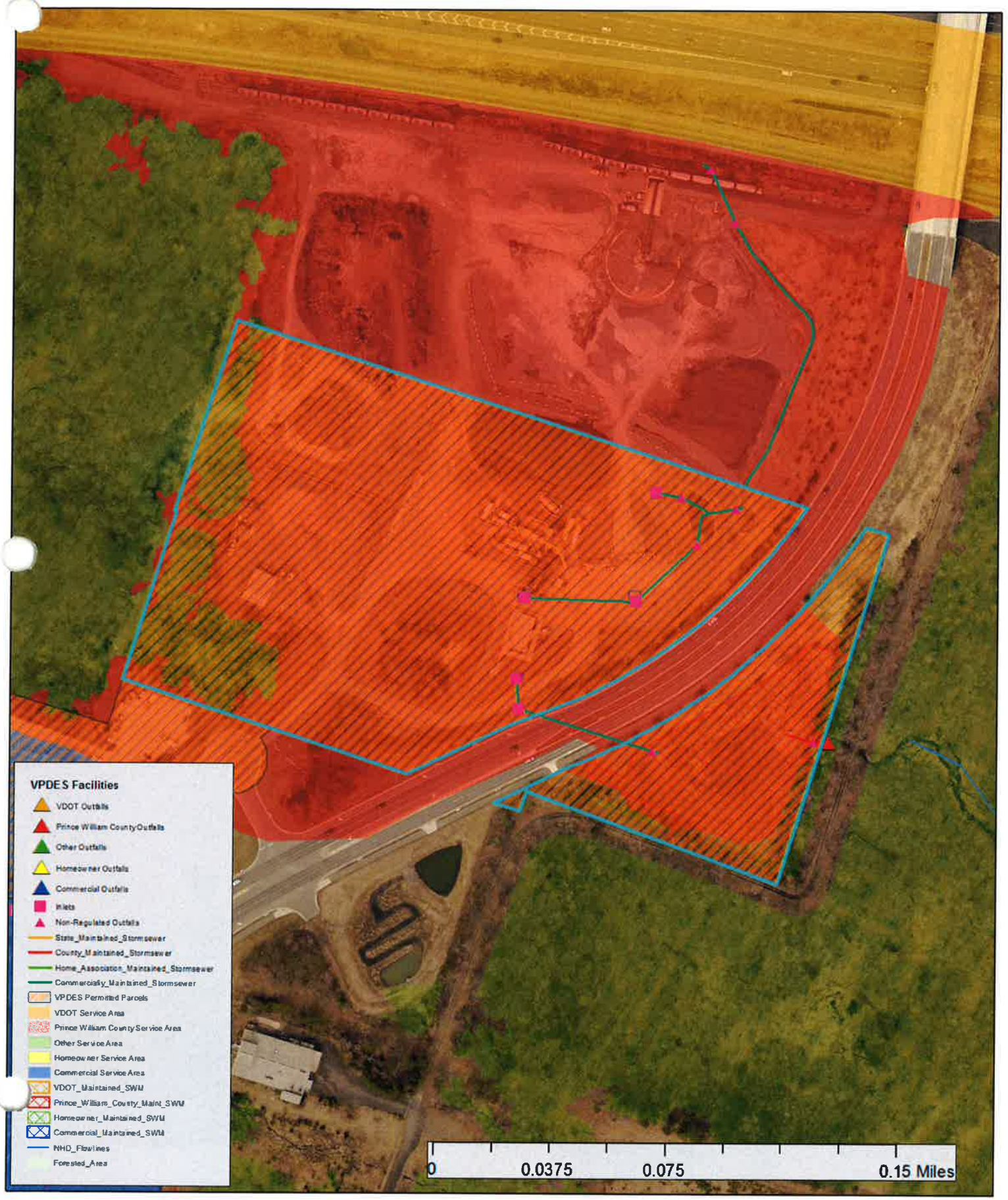
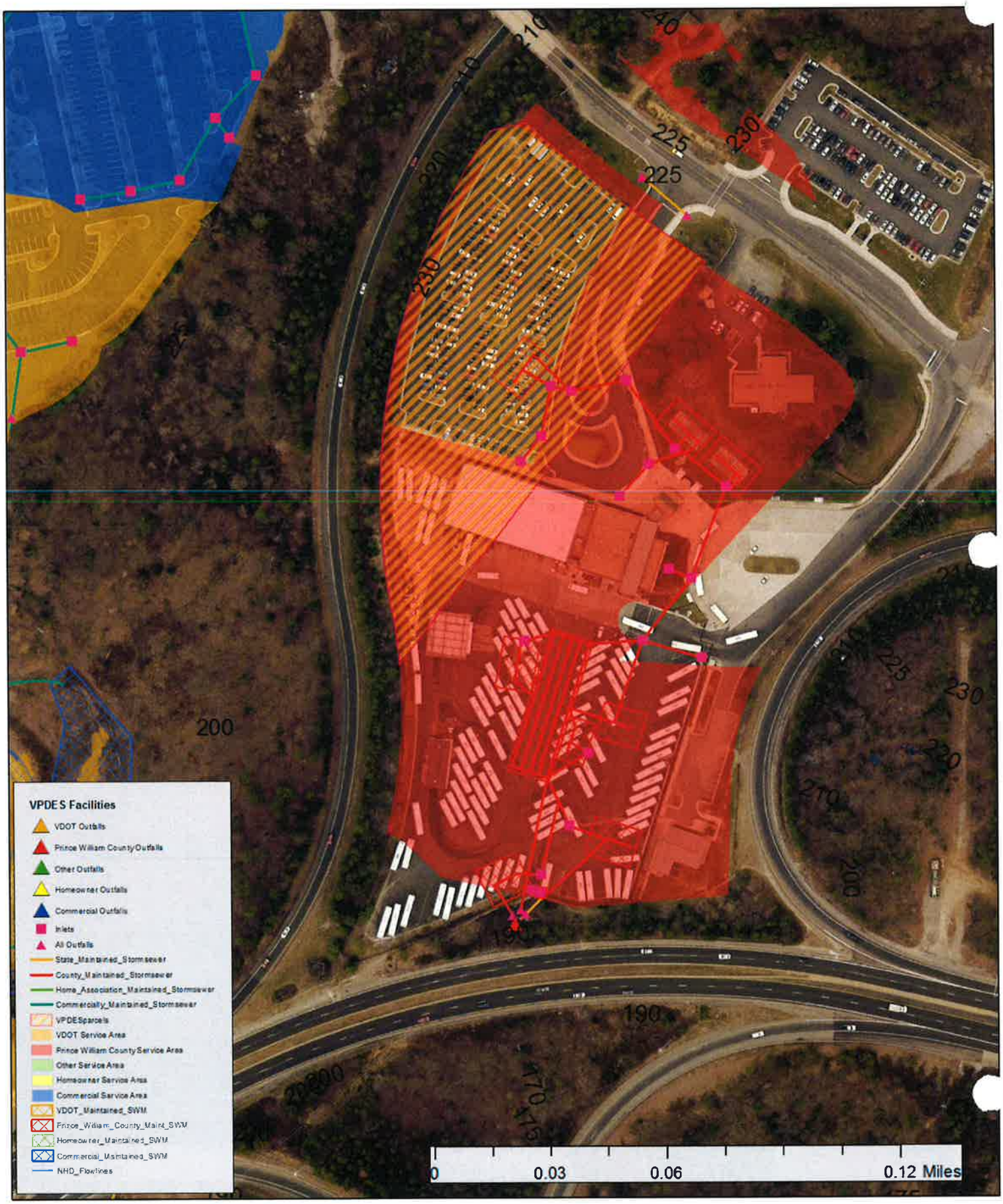
VPDES Permitted Facilities

Chemung Contracting Corporation - Gainesville
Permit No: VAR051949



VPDES Permitted Facilities

First Transit Incorporated
Permit No: VAR051477

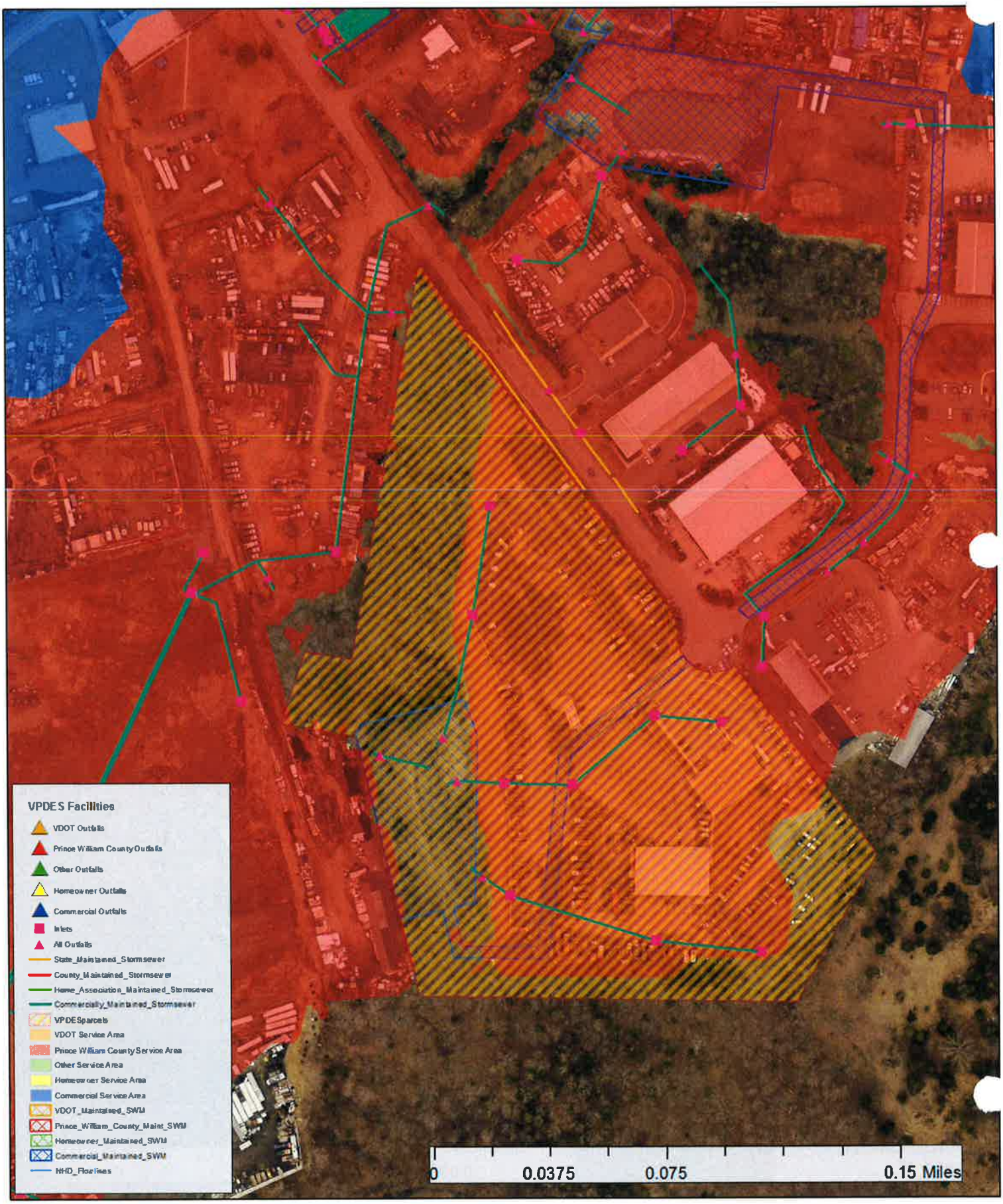


VPDES Permitted Facilities

Penny's Used Auto Parts
Permit No: VAR052115

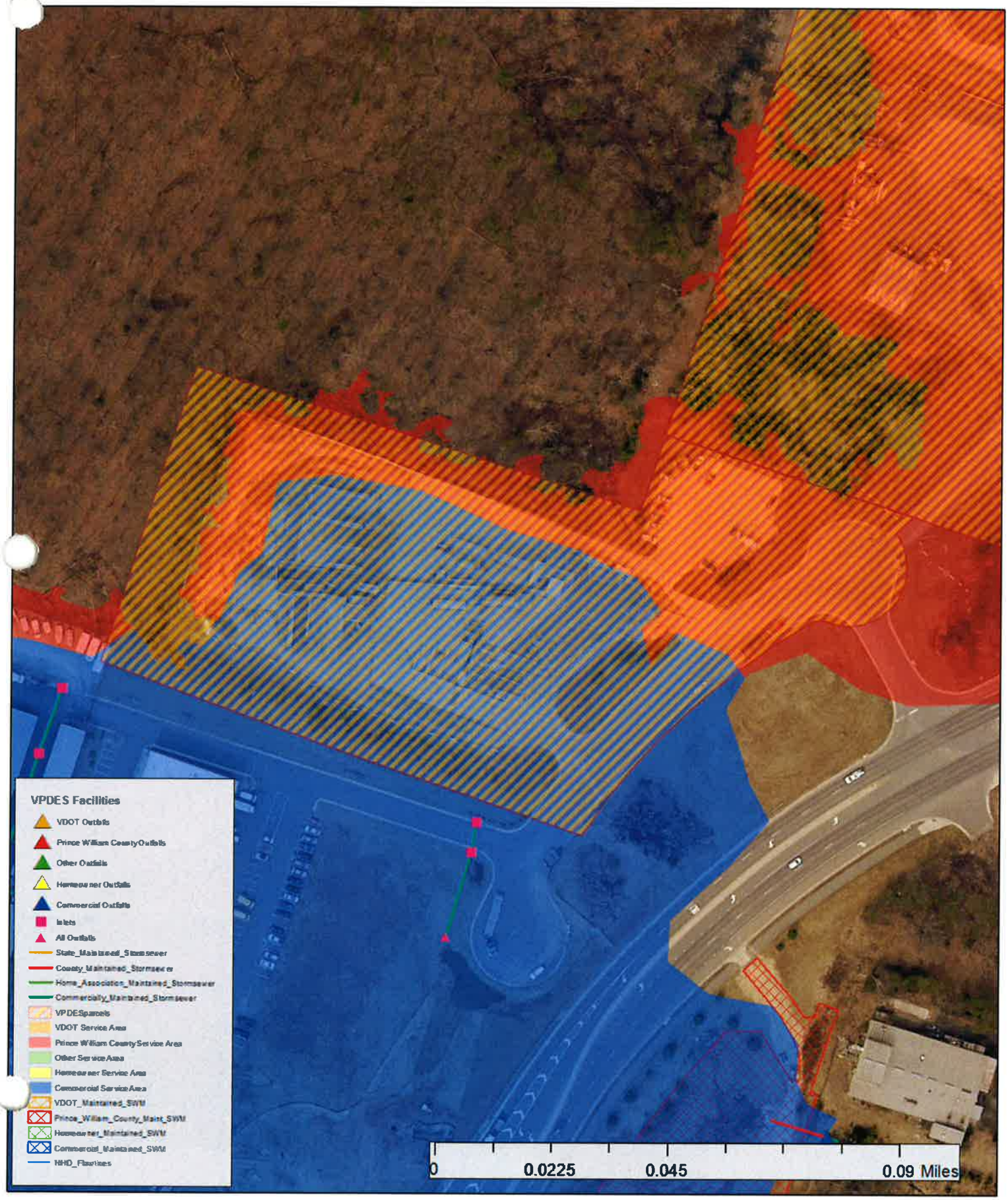
VPDES Permitted Facilities

Potomac Disposal Services of Virginia, LLC
Permit No: VAR051639



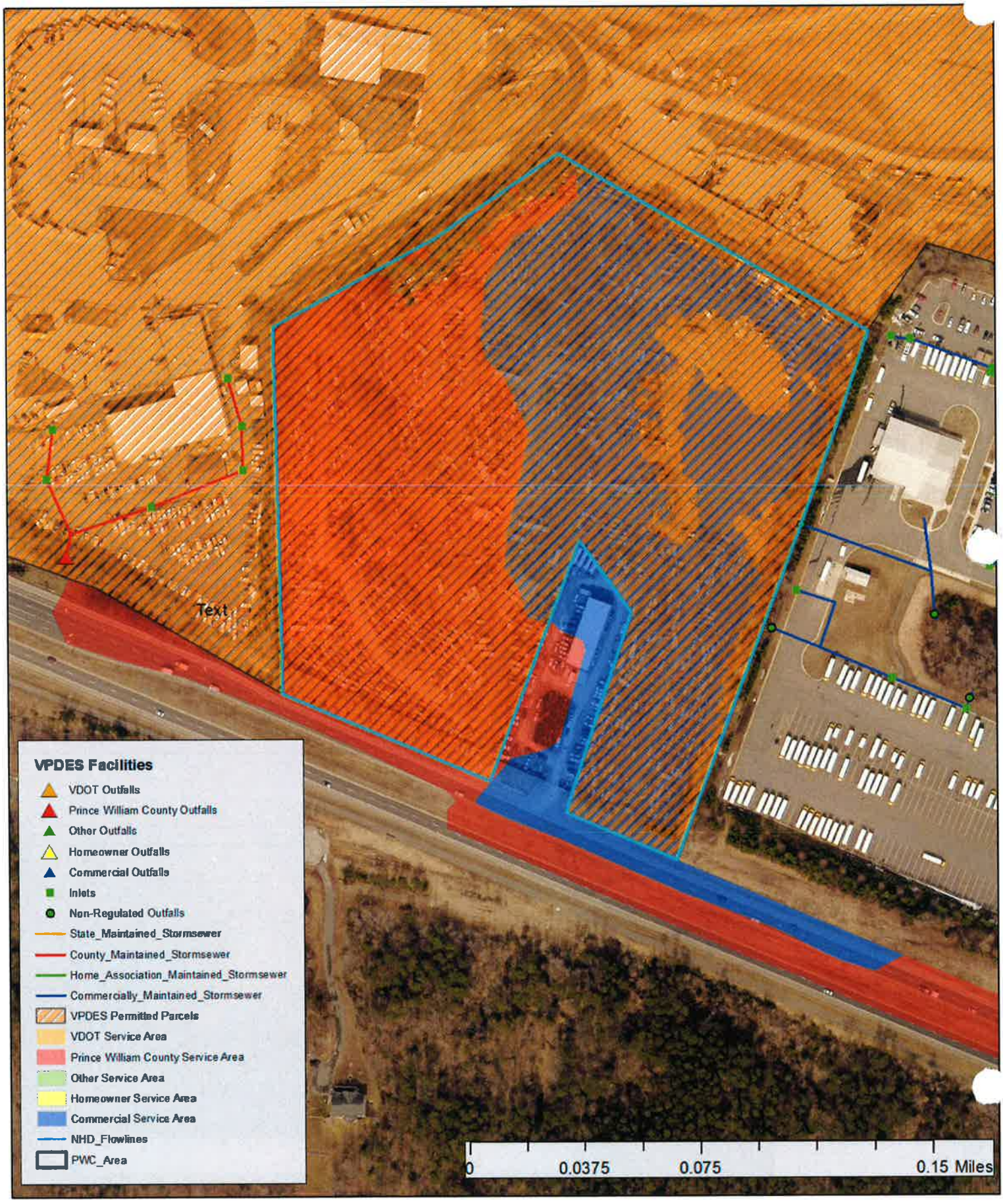
VPDES Permitted Facilities

Virginia Concrete Company Inc - Gainesville
Permit No: VAG110100



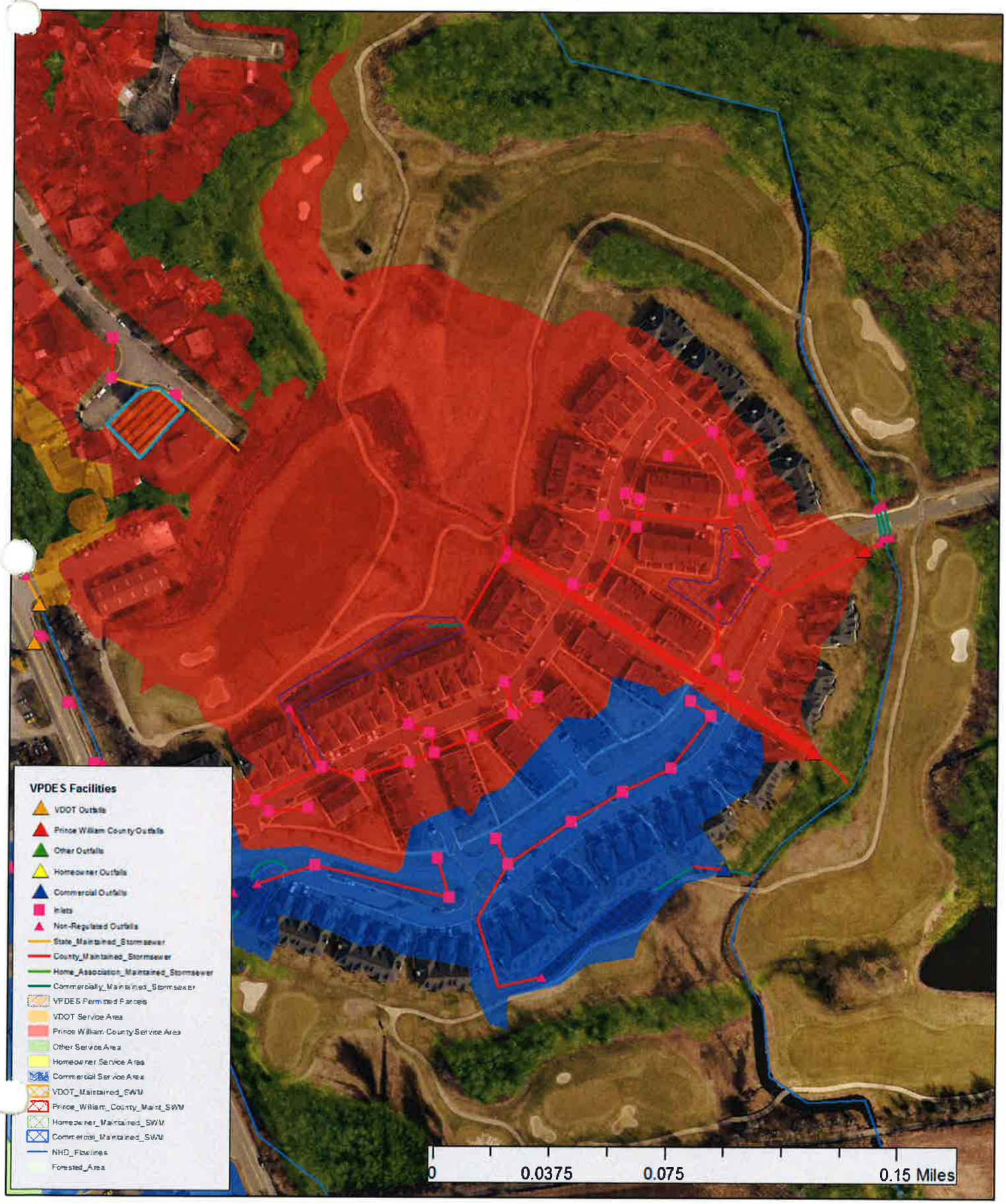
VPDES Permitted Facilities

234 Auto and Truck Salvage Limited Liability Company
Permit No: VAR052243



VPDES Permitted Facilities

Chase David D Residence
Permit No: VAG830458



Appendix H – Stormsewer Infrastructure Management

COUNTY MAINTAINED SWM INSPECTIONS (FY17)

Date	Facility ID	Inspection Type	Comments	Maintenance Required?	
7/5/2016	813	Re-inspection	Work completed	Minor	N
7/5/2016	382	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/5/2016	808	Complaint	No work needed	None	N
7/11/2016	906	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/11/2016	907	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/14/2016	477	Complaint	Muddy runoff from nearby construction	Minor	N
7/14/2016	482	Complaint	Sediment build up	None	N
7/18/2016	75	Complaint	188' of fence repair needed	Minor	N
7/18/2016	307	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/18/2016	619	Routine	Needs maintenance	Minor	Y
7/19/2016	307	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/21/2016	853	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/21/2016	854	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/21/2016	464	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/28/2016	467	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/28/2016	468	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/28/2016	469	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
7/28/2016	813	Re-inspection	Work in progress	Major	Y
8/2/2016	906	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/2/2016	907	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/5/2016	563	Complaint	Fence repair needed. Forwarded to Khalid	Minor	N
8/16/2016	386	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/16/2016	91	Re-inspection	Work completed	None	N
8/16/2016	99	Re-inspection	Work completed	None	N
8/16/2016	489	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/16/2016	251	Complaint	Fence repair needed. Forwarded to Khalid	Minor	Y
8/17/2016	513	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/17/2016	506	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/17/2016	507	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
8/23/2016	600	Site meeting	Needs maintenance	Minor	Y
8/29/2016	950	Routine	Needs maintenance	Minor	Y
9/8/2016	600	Re-inspection	Work completed	None	N
9/8/2016	89	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/12/2016	282	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/13/2016	836	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/20/2016	931	Routine	Maintenance needed	Minor	Y
9/20/2016	932	Routine	Maintenance needed	Minor	Y
9/20/2016	176	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/21/2016	421	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/22/2016	238	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/22/2016	387	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/22/2016	388	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/22/2016	389	Site meeting	Met with the property owner / contractor to discuss the	Minor	Y
9/22/2016	363	Complaint	Complaint	Minor	Y

9/26/2016	481	Complaint	Work forwarded to Khalid	None	N
9/26/2016	504	Routine	Needs maintenance	Major	Y
9/26/2016	451	Routine	Needs maintenance	Minor	Y
9/26/2016	624	Complaint	Needs maintenance	Major	Y
10/12/2016	106	Complaint	No maintenance needed	None	N
10/13/2016	238	Reinspection / SM	Maintenance needed	Minor	Y
10/13/2016	387	Reinspection / SM	Maintenance needed	Minor	Y
10/13/2016	388	Reinspection / SM	Maintenance needed	Minor	Y
10/13/2016	389	Reinspection / SM	Maintenance needed	Minor	Y
10/18/2016	935	Site Meeting	Maintenance needed	Minor	Y
10/18/2016	482	Site Meeting	Maintenance needed	Major	Y
10/28/2016	75	Site Meeting	Maintenance needed	Minor	Y
10/28/2016	125	Site Meeting	Maintenance needed	Minor	Y
10/31/2016	476	Routine	Maintenance needed	Minor	Y
11/2/2016	52	Routine	Maintenance needed	Minor	Y
11/2/2016	474	Routine	Maintenance needed	Major	Y
11/2/2016	587	Routine	Maintenance needed	Major	Y
11/2/2016	822	Routine	No maintenance needed	None	N
11/2/2016	839	Routine	No maintenance needed	None	N
11/3/2016	71	Routine	Maintenance needed	Minor	Y
11/3/2016	310	Routine	No maintenance needed	None	N
11/3/2016	322	Routine	Maintenance needed	Minor	Y
11/3/2016	611	Routine	No maintenance needed	None	N
11/3/2016	637	Routine	No maintenance needed	None	N
12/29/2016	445	Routine	Maintenance needed	Minor	*Y*
12/29/2016	553	Routine	Maintenance needed	Minor	*Y*
12/29/2016	564	Routine	Maintenance needed	Minor	*Y*
12/29/2016	895	Routine	Maintenance needed	Minor	*Y*
12/29/2016	896	Routine	Maintenance needed	Minor	*Y*
12/29/2016	897	Routine	Maintenance needed	Minor	*Y*
12/30/2016	525	Routine	Maintenance needed	Minor	*Y*
12/30/2016	558	Routine	Maintenance needed	Minor	*Y*
12/30/2016	590	Routine	Maintenance needed	Minor	*Y*
12/30/2016	618	Routine	No maintenance needed	None	*N*
12/30/2016	818	Routine	No maintenance needed	None	*N*
1/3/2017	350	Routine	No maintenance needed	None	N
1/3/2017	37	Routine	Maintenance needed	Minor	Y
1/3/2017	20	Routine	Maintenance needed	Minor	Y
1/3/2017	428	Routine	Maintenance needed	Minor	Y
1/4/2017	463	Routine	Maintenance needed	Minor	Y
1/4/2017	38	Routine	No maintenance needed	None	N
1/4/2017	160	Routine	Maintenance needed	Major	Y
1/4/2017	376	Routine	Maintenance needed	Minor	Y
1/4/2017	146	Routine	Maintenance needed	Minor	Y
1/4/2017	265	Routine	Maintenance needed	Minor	Y
1/4/2017	266	Routine	No maintenance needed	None	N

1/4/2017	177	Routine	Maintenance needed	Minor	Y
1/4/2017	267	Routine	No maintenance needed	None	N
1/4/2017	280	Routine	Maintenance needed	Minor	Y
1/4/2017	279	Routine	No maintenance needed	None	N
1/4/2017	21	Routine	No maintenance needed	None	N
1/4/2017	354	Routine	Maintenance needed	Minor	Y
1/4/2017	466	Routine	Maintenance needed	Minor	Y
1/4/2017	203	Routine	Maintenance needed	Minor	Y
1/4/2017	401	Routine	Maintenance needed	Minor	Y
1/4/2017	663	Routine	Maintenance needed	Minor	Y
1/4/2017	211	Routine	No maintenance needed	None	N
1/4/2017	692	Routine	Maintenance needed	Minor	Y
1/4/2017	537	Routine	Maintenance needed	Minor	Y
1/4/2017	464	Routine	Maintenance needed	Minor	Y
1/5/2017	446	Routine	Maintenance needed	Minor	Y
1/9/2017	44	Routine	Maintenance needed	Minor	Y
1/9/2017	214	Routine	Maintenance needed	Minor	Y
1/9/2017	410	Routine	Maintenance needed	Minor	Y
1/9/2017	695	Routine	No maintenance needed	None	N
1/9/2017	386	Routine	Maintenance needed	Minor	Y
1/9/2017	651	Routine	No maintenance needed	None	N
1/10/2017	887	Routine	No maintenance needed	None	N
1/10/2017	613	Routine	Maintenance needed	Minor	Y
1/10/2017	850	Routine	Maintenance needed	Minor	Y
1/10/2017	543	Routine	Maintenance needed	Minor	Y
1/10/2017	234	Routine	Maintenance needed	Minor	Y
1/10/2017	232	Routine	Maintenance needed	Minor	Y
1/10/2017	535	Routine	Maintenance needed	Minor	Y
1/10/2017	47	Routine	Maintenance needed	Major	Y
1/10/2017	59	Routine	Maintenance needed	Major	Y
1/10/2017	531	Routine	Maintenance needed	Minor	Y
1/11/2017	412	Routine	Maintenance needed	Minor	Y
1/11/2017	397	Routine	Maintenance needed	Minor	Y
1/11/2017	390	Routine	Maintenance needed	Minor	Y
1/11/2017	290	Routine	No maintenance needed	None	N
1/11/2017	61	Routine	Maintenance needed	Minor	Y
1/11/2017	957	Routine	No maintenance needed	None	N
1/11/2017	957	Routine	No maintenance needed	None	N
1/11/2017	957	Routine	No maintenance needed	None	N
1/11/2017	805	Routine	Maintenance needed	Minor	Y
1/11/2017	218	Routine	Maintenance needed	Minor	Y
1/11/2017	91	Routine	Maintenance needed	Minor	Y
1/11/2017	808	Routine	Maintenance needed	Minor	Y
1/12/2017	455	Routine	Maintenance needed	Minor	Y
1/12/2017	874	Routine	Maintenance needed	Minor	Y
1/12/2017	654	Routine	Maintenance needed	Minor	Y

1/12/2017	699	Routine	Maintenance needed	Minor	Y
1/12/2017	690	Routine	Maintenance needed	Minor	Y
1/12/2017	147	Routine	No maintenance needed	None	N
1/12/2017	147	Routine	No maintenance needed	None	N
1/12/2017	562	Routine	Maintenance needed	Minor	Y
1/12/2017	187	Routine	No maintenance needed	None	N
1/12/2017	278	Routine	Maintenance needed	Minor	Y
1/12/2017	880	Routine	No maintenance needed	None	N
1/12/2017	604	Routine	Maintenance needed	Minor	Y
1/12/2017	584	Routine	Maintenance needed	Minor	Y
1/12/2017	427	Routine	Maintenance needed	Minor	Y
1/12/2017	520	Routine	Maintenance needed	Minor	Y
1/12/2017	655	Routine	Maintenance needed	Minor	Y
1/12/2017	812	Routine	Maintenance needed	Minor	Y
1/12/2017	288	Routine	No maintenance needed	None	N
1/12/2017	289	Routine	No maintenance needed	None	N
1/12/2017	255	Routine	No maintenance needed	None	N
1/12/2017	836	Routine	Maintenance needed	Major	Y
1/13/2017	405	Routine	Maintenance needed	Minor	Y
1/13/2017	144	Routine	Maintenance needed	Minor	Y
1/13/2017	235	Routine	Maintenance needed	Minor	Y
1/13/2017	627	Routine	Maintenance needed	Minor	Y
1/17/2017	158	Routine	Maintenance needed	Minor	Y
1/17/2017	882	Routine	Maintenance needed	Minor	Y
1/17/2017	881	Routine	Maintenance needed	Minor	Y
1/17/2017	467	Routine	Maintenance needed	Minor	Y
1/18/2017	469	Routine	Maintenance needed	Minor	Y
1/18/2017	468	Routine	Maintenance needed	Minor	Y
1/18/2017	453	Routine	Maintenance needed	Minor	Y
1/19/2017	804	Routine	Maintenance needed	Minor	Y
1/19/2017	440	Routine	No maintenance needed	None	N
1/19/2017	441	Routine	Maintenance needed	Minor	Y
1/19/2017	510	Routine	No maintenance needed	None	N
1/19/2017	512	Routine	Maintenance needed	Major	Y
1/19/2017	566	Routine	Maintenance needed	Minor	Y
1/19/2017	630	Routine	Maintenance needed	Major	Y
1/19/2017	631	Routine	Maintenance needed	Minor	Y
1/19/2017	842	Routine	Maintenance needed	Minor	Y
1/19/2017	841	Routine	Maintenance needed	Minor	Y
1/19/2017	159	Routine	Maintenance needed	Minor	Y
1/19/2017	332	Routine	Maintenance needed	Minor	Y
1/19/2017	840	Routine	Maintenance needed	Minor	Y
1/19/2017	650	Routine	No maintenance needed	None	N
1/20/2017	801	Routine	Maintenance needed	Major	Y
1/20/2017	802	Routine	No maintenance needed	None	N
1/20/2017	621	Routine	No maintenance needed	None	N

1/20/2017	849	Routine	No maintenance needed	None	N
1/20/2017	816	Routine	No maintenance needed	None	N
1/20/2017	817	Routine	No maintenance needed	None	N
1/20/2017	516	Routine	Maintenance needed	Minor	Y
1/20/2017	546	Routine	No maintenance needed	None	N
1/20/2017	515	Routine	No maintenance needed	None	N
1/23/2017	649	Routine	Maintenance needed	Minor	Y
1/23/2017	610	Routine	Maintenance needed	Minor	Y
1/23/2017	889	Routine	No maintenance needed	None	N
1/23/2017	575	Routine	Maintenance needed	Minor	Y
1/24/2017	237	Routine	No maintenance needed	None	N
1/25/2017	511	Routine	No maintenance needed	None	N
1/25/2017	514	Routine	No maintenance needed	None	N
1/27/2017	582	Routine	Maintenance needed	Minor	Y
1/28/2017	353	Routine	No maintenance needed	None	N
1/30/2017	352	Routine	Maintenance needed	Minor	Y
1/30/2017	671	Routine	Maintenance needed	Minor	Y
1/30/2017	431	Routine	Maintenance needed	Minor	Y
1/30/2017	509	Routine	Maintenance needed	Minor	Y
1/30/2017	508	Routine	Maintenance needed	Minor	Y
1/30/2017	296	Routine	Maintenance needed	Minor	Y
1/30/2017	851	Routine	Maintenance needed	Minor	Y
1/30/2017	843	Routine	Maintenance needed	Minor	Y
1/30/2017	668	Routine	Maintenance needed	Minor	Y
1/30/2017	581	Routine	Maintenance needed	Minor	Y
1/30/2017	688	Routine	Maintenance needed	Minor	Y
1/30/2017	249	Routine	No maintenance needed	None	N
1/30/2017	240	Routine	Maintenance needed	Major	Y
1/30/2017	451	Routine	No maintenance needed	None	N
1/30/2017	577	Routine	Maintenance needed	Major	Y
1/30/2017	576	Routine	Maintenance needed	Major	Y
1/30/2017	670	Routine	Maintenance needed	Minor	Y
1/31/2017	5037	Complaint Based	No maintenance needed	None	N
1/31/2017	956	60-day reinspection	No maintenance needed	None	N
1/31/2017	958	Routine	No maintenance needed	None	N
1/31/2017	908	Routine	Maintenance needed	Minor	Y
2/2/2017	909	Routine	Maintenance needed	Minor	Y
2/3/2017	628	Routine	Maintenance needed	Minor	Y
2/6/2017	28	Complaint Based	No maintenance needed	None	N
2/7/2017	490	Routine	No maintenance needed	None	N
2/7/2017	248	Routine	No maintenance needed	None	N
2/7/2017	247	Routine	No maintenance needed	None	N
2/7/2017	221	Routine	No maintenance needed	None	N
2/7/2017	222	Routine	No maintenance needed	None	N
2/7/2017	391	Routine	Maintenance needed	Minor	Y
2/7/2017	392	Routine	No maintenance needed	None	N

2/7/2017	393	Routine	No maintenance needed	None	N
2/7/2017	402	Routine	Maintenance needed	Minor	Y
2/7/2017	661	Routine	Maintenance needed	Minor	Y
2/7/2017	893	Routine	Maintenance needed	Minor	Y
2/7/2017	395	Routine	Maintenance needed	Minor	Y
2/7/2017	481	Complaint Based	Maintenance needed	Minor	Y
2/7/2017	250	Routine	No maintenance needed	None	N
2/7/2017	844	Routine	Maintenance needed	Major	Y
2/7/2017	364	Routine	No maintenance needed	None	N
2/7/2017	365	Routine	No maintenance needed	None	N
2/7/2017	366	Routine	Maintenance needed	Major	Y
2/7/2017	367	Routine	No maintenance needed	None	N
2/8/2017	648	Routine	Maintenance needed	Major	Y
2/8/2017	660	Routine	No maintenance needed	None	N
2/8/2017	213	Routine	No maintenance needed	None	N
2/8/2017	212	Routine	No maintenance needed	None	N
2/8/2017	324	Routine	No maintenance needed	None	N
2/9/2017	239	Routine	Maintenance needed	Minor	Y
2/9/2017	215	Routine	Maintenance needed	Minor	Y
2/9/2017	241	Routine	Maintenance needed	Minor	Y
2/9/2017	205	Routine	Maintenance needed	Minor	Y
2/9/2017	204	Routine	Maintenance needed	Minor	Y
2/9/2017	244	Routine	Maintenance needed	Minor	Y
2/9/2017	243	Routine	Maintenance needed	Minor	Y
2/9/2017	242	Routine	Maintenance needed	Minor	Y
2/9/2017	689	Routine	Maintenance needed	Minor	Y
2/10/2017	903	Routine	Maintenance needed	Minor	Y
2/10/2017	902	Routine	No maintenance needed	None	N
2/15/2017	554	Routine	Maintenance needed	Minor	Y
2/15/2017	84	Routine	Maintenance needed	Minor	Y
2/15/2017	85	Routine	Maintenance needed	Minor	Y
2/15/2017	569	Routine	Maintenance needed	Minor	Y
2/15/2017	438	Routine	Maintenance needed	Minor	Y
2/15/2017	437	Routine	Maintenance needed	Minor	Y
2/15/2017	323	Routine	No maintenance needed	None	N
2/15/2017	291	Routine	No maintenance needed	None	N
2/15/2017	518	Routine	Maintenance needed	Major	Y
2/15/2017	488	Routine	No maintenance needed	None	N
2/15/2017	549	Routine	Maintenance needed	Major	Y
2/15/2017	578	Routine	Maintenance needed	Minor	Y
2/16/2017	56	Routine	No maintenance needed	None	N
2/16/2017	527	Routine	Maintenance needed	Minor	Y
2/16/2017	885	Routine	Maintenance needed	Minor	Y
2/16/2017	88	Routine	Maintenance needed	Minor	Y
2/16/2017	286	Routine	Maintenance needed	Minor	Y
2/17/2017	579	Routine	Maintenance needed	Minor	Y

2/17/2017	863	Routine	Maintenance needed	Minor	Y
2/17/2017	819	Routine	Maintenance needed	Minor	Y
2/17/2017	155	Routine	Maintenance needed	Minor	Y
2/21/2017	641	Routine	Maintenance needed	Minor	Y
2/21/2017	875	Routine	Maintenance needed	Minor	Y
2/21/2017	206	Routine	No maintenance needed	None	N
2/21/2017	596	Routine	Maintenance needed	Major	Y
2/21/2017	595	Routine	No maintenance needed	None	N
2/21/2017	594	Routine	No maintenance needed	None	N
2/21/2017	664	Routine	Maintenance needed	Minor	Y
2/21/2017	472	Routine	No maintenance needed	None	N
2/23/2017	210	Routine	No maintenance needed	None	N
2/23/2017	691	Routine	Maintenance needed	Minor	Y
2/23/2017	895	60-day reinspection	No maintenance needed	None	N
2/23/2017	163	Routine	Maintenance needed	Major	Y
2/23/2017	92	Routine	Maintenance needed	Minor	Y
2/23/2017	896	60-day reinspection	No maintenance needed	None	N
2/23/2017	897	60-day reinspection	No maintenance needed	None	N
2/23/2017	962	Other	No maintenance needed	None	N
2/24/2017	526	Routine	No maintenance needed	None	N
2/24/2017	272	Routine	Maintenance needed	Minor	Y
2/24/2017	605	Routine	No maintenance needed	None	N
2/24/2017	207	Routine	No maintenance needed	None	N
2/27/2017	293	Routine	No maintenance needed	None	N
2/27/2017	294	Routine	Maintenance needed	Minor	Y
2/27/2017	876	Routine	Maintenance needed	Minor	Y
2/28/2017	343	Routine	Maintenance needed	Minor	Y
2/28/2017	686	Routine	Maintenance needed	Minor	Y
2/28/2017	77	Routine	No maintenance needed	None	N
2/28/2017	76	Routine	No maintenance needed	None	N
2/28/2017	682	Routine	Maintenance needed	Minor	Y
2/28/2017	310	Complaint Based	No maintenance needed	None	N
2/28/2017	199	Routine	Maintenance needed	Major	Y
2/28/2017	101	Routine	Maintenance needed	Major	Y
2/28/2017	102	Routine	Maintenance needed	Major	Y
3/1/2017	198	Routine	Maintenance needed	Major	Y
3/1/2017	327	Routine	Maintenance needed	Major	Y
3/1/2017	519	Routine	No maintenance needed	None	N
3/1/2017	616	Routine	Maintenance needed	Major	Y
3/1/2017	271	Routine	No maintenance needed	None	N
3/1/2017	883	Routine	No maintenance needed	None	N
3/2/2017	809	Routine	No maintenance needed	None	N
3/2/2017	426	Routine	No maintenance needed	None	N
3/2/2017	929	Routine	Maintenance needed	Minor	Y
3/2/2017	862	Routine	No maintenance needed	None	N
3/3/2017	325	Routine	Maintenance needed	Major	Y

3/3/2017	548	Routine	Maintenance needed	Minor	Y
3/3/2017	869	Routine	Maintenance needed	Minor	Y
3/3/2017	665	Routine	No maintenance needed	None	N
3/3/2017	666	Routine	Maintenance needed	Major	Y
3/3/2017	281	Routine	Maintenance needed	Minor	Y
3/3/2017	960	Routine	Maintenance needed	Minor	Y
3/6/2017	657	Routine	Maintenance needed	Minor	Y
3/6/2017	313	Routine	Maintenance needed	Minor	Y
3/7/2017	439	Routine	Maintenance needed	Minor	Y
3/8/2007	803	Reinspection	Work completed	None	N
3/8/2017	57	Routine	Maintenance needed	Major	Y
3/8/2017	685	Routine	Maintenance needed	Minor	Y
3/9/2017	888	Routine	No maintenance needed	None	N
3/15/2017	166	Routine	Maintenance needed	Major	Y
3/15/2017	75	Routine	Maintenance needed	Major	Y
3/16/2017	308	Routine	No maintenance needed	None	N
3/17/2017	530	Routine	Maintenance needed	Minor	Y
3/17/2017	640	Routine	No maintenance needed	None	N
3/17/2017	865	Routine	Maintenance needed	Minor	Y
3/17/2017	494	Routine	Maintenance needed	Minor	Y
3/20/2017	182	Routine	Maintenance needed	Minor	Y
3/20/2017	183	Routine	Maintenance needed	Minor	Y
3/21/2017	642	Routine	Maintenance needed	Minor	Y
3/21/2017	314	Routine	Maintenance needed	Minor	Y
3/23/2017	212	Routine	Work needed	Major	Y
3/23/2017	213	Routine	Work needed	Major	Y
3/23/2017	393	Reinspection	Work completed	Major	Y
3/23/2017	392	Reinspection	Work completed	Major	Y
3/24/2017	63	Routine	Maintenance needed	Minor	Y
3/24/2017	633	Routine	Maintenance needed	Minor	Y
3/24/2017	632	Routine	Maintenance needed	Minor	Y
3/27/2017	225	Routine	Maintenance needed	Minor	Y
3/27/2017	220	Routine	Maintenance needed	Minor	Y
3/27/2017	524	Routine	Maintenance needed	Minor	Y
3/27/2017	90	Routine	Maintenance needed	Minor	Y
3/28/2017	626	Reinspection	Work completed	Minor	Y
3/28/2017	810	Routine	Work needed	Minor	Y
3/30/2017	629	Routine	Work needed	Minor	Y
3/30/2017	961	Routine	Work needed	Minor	Y
3/30/2017	550	Routine	No maintenance needed	None	N
3/30/2017	396	Routine	No maintenance needed	None	N
3/30/2017	915	Routine	Work needed	Minor	Y
3/30/2017	914	Routine	Work needed	Minor	Y
3/30/2017	923	Routine	Work needed	Minor	Y
3/30/2017	913	Routine	Work needed	Minor	Y
3/30/2017	900	Routine	Work needed	Minor	Y

3/30/2017	415	Routine	Work needed	Minor	Y
3/31/2017	810	Routine	Maintenance needed	Minor	Y
3/31/2017	415	Routine	Maintenance needed	Minor	Y
3/31/2017	629	Routine	No maintenance needed	None	N
3/31/2017	550	Routine	No maintenance needed	None	N
3/31/2017	396	Routine	No maintenance needed	None	N
4/3/2017	506	Routine	No maintenance needed	Minor	Y
4/3/2017	507	Routine	Maintenance needed	None	N
4/3/2017	513	Routine	Maintenance needed	None	N
4/3/2017	540	Routine	No maintenance needed	Minor	Y
4/3/2017	917	Routine	Maintenance needed	None	N
4/3/2017	400	Routine	No maintenance needed	Minor	Y
4/3/2017	403	Routine	Maintenance needed	None	N
4/3/2017	378	Routine	No maintenance needed	Minor	Y
4/3/2017	219	Routine	Maintenance needed	None	N
4/3/2017	643	Routine	Maintenance needed	None	N
4/3/2017	914	Routine	Maintenance needed	None	N
4/3/2017	923	Routine	Maintenance needed	None	N
4/3/2017	644	Routine	Maintenance needed	None	N
4/4/2017	435	Routine	Maintenance needed	None	N
4/4/2017	950	Routine	No maintenance needed	Minor	Y
4/4/2017	236	Routine	Maintenance needed	None	N
4/4/2017	460	Routine	Maintenance needed	None	N
4/4/2017	521	Routine	Maintenance needed	None	N
4/5/2017	315	Routine	Maintenance needed	None	N
4/5/2017	588	Routine	Maintenance needed	None	N
4/5/2017	589	Routine	Maintenance needed	None	N
4/5/2017	574	Routine	Maintenance needed	Major	Y
4/5/2017	573	Routine	No maintenance needed	Minor	Y
4/5/2017	572	Routine	No maintenance needed	None	N
4/6/2017	915	Routine	Maintenance needed	None	N
4/6/2017	900	Routine	No maintenance needed	Minor	Y
4/6/2017	913	Routine	Maintenance needed	None	N
4/6/2017	913	Routine	Maintenance needed	None	N
4/6/2017	913	Routine	Maintenance needed	None	N
4/6/2017	913	Routine	Maintenance needed	None	N
4/7/2017	238	Routine	No maintenance needed	Minor	Y
4/7/2017	387	Routine	No maintenance needed	None	N
4/7/2017	388	Routine	No maintenance needed	None	N
4/7/2017	389	Routine	No maintenance needed	Minor	Y
4/10/2017	164	Routine	Maintenance needed	Minor	Y
4/10/2017	330	Routine	Maintenance needed	Minor	Y
4/10/2017	443	Routine	No maintenance needed	None	N
4/10/2017	103	Routine	Maintenance needed	Major	Y
4/10/2017	838	Routine	Maintenance needed	None	N
4/10/2017	311	Routine	No maintenance needed	None	N

4/10/2017	69	Routine	Maintenance needed	Minor	Y
4/10/2017	105	Routine	Maintenance needed	Minor	Y
4/10/2017	447	Routine	Maintenance needed	None	N
4/10/2017	448	Routine	Maintenance needed	Minor	Y
4/10/2017	449	Routine	No maintenance needed	None	N
4/10/2017	450	Routine	No maintenance needed	None	N
4/10/2017	134	Routine	No maintenance needed	None	N
4/10/2017	185	Routine	No maintenance needed	None	N
4/11/2017	300	Routine	No maintenance needed	None	N
4/11/2017	602	Routine	No maintenance needed	None	N
4/11/2017	619	Routine	Maintenance needed	Minor	Y
4/11/2017	845	Routine	Maintenance needed	Major	Y
4/11/2017	886	Routine	Maintenance needed	None	N
4/11/2017	645	Routine	No maintenance needed	None	N
4/11/2017	646	Routine	No maintenance needed	None	N
4/12/2017	295	Routine	No maintenance needed	None	N
4/12/2017	407	Routine	Maintenance needed	Minor	Y
4/12/2017	408	Routine	No maintenance needed	None	N
4/12/2017	409	Routine	No maintenance needed	None	N
4/12/2017	316	Routine	Maintenance needed	Minor	Y
4/12/2017	454	Reinspection	Work not completed	Minor	Y
4/12/2017	683	Routine	Maintenance needed	Minor	Y
4/12/2017	542	Routine	Maintenance needed	Minor	Y
4/12/2017	591	Routine	No maintenance needed	None	N
4/12/2017	13	Routine	No maintenance needed	None	N
4/12/2017	14	Routine	No maintenance needed	None	N
4/26/2017	106	Routine	Maintenance needed	Minor	Y
4/26/2017	586	Routine	Maintenance needed	Minor	Y
4/26/2017	486	Routine	Maintenance needed	Minor	Y
4/26/2017	485	Routine	Maintenance needed	Minor	Y
4/26/2017	487	Routine	Maintenance needed	Minor	Y
4/27/2017	962	Routine	No maintenance needed	None	N
4/28/2017	625	Routine	Maintenance needed	Minor	Y
4/28/2017	614	Routine	Maintenance needed	Minor	Y
4/28/2017	615	Routine	Maintenance needed	Minor	Y
4/28/2017	693	Routine	No maintenance needed	None	N
4/28/2017	600	Routine	Maintenance needed	Minor	Y
5/2/2017	824	Routine	Maintenance needed	Minor	Y
5/2/2017	825	Routine	Maintenance needed	Minor	Y
5/2/2017	826	Routine	Maintenance needed	Minor	Y
5/2/2017	827	Routine	Maintenance needed	Minor	Y
5/2/2017	828	Routine	Maintenance needed	Minor	Y
5/2/2017	829	Routine	Maintenance needed	Minor	Y
5/2/2017	830	Routine	Maintenance needed	Minor	Y
5/2/2017	831	Routine	Maintenance needed	Minor	Y
5/2/2017	832	Routine	Maintenance needed	Minor	Y

5/2/2017	833	Routine	Maintenance needed	Minor	Y
5/2/2017	834	Routine	Maintenance needed	Minor	Y
5/2/2017	835	Routine	Maintenance needed	Minor	Y
5/2/2017	891	Routine	Maintenance needed	Minor	Y
5/3/2017	190	Routine	Maintenance needed	Minor	Y
5/3/2017	910	Routine	Maintenance needed	Minor	Y
5/3/2017	578	Routine	Maintenance needed	Minor	Y
5/3/2017	579	Routine	Maintenance needed	Minor	Y
5/4/2017	624	Routine	Maintenance needed	Major	Y
5/4/2017	858	Routine	Maintenance needed	Major	Y
5/4/2017	823	Routine	Maintenance needed	Minor	Y
5/4/2017	652	Routine	Maintenance needed	Minor	Y
5/4/2017	669	Routine	Maintenance needed	Minor	Y
5/4/2017	528	Routine	Maintenance needed	Minor	Y
5/4/2017	270	Routine	Maintenance needed	Minor	Y
5/4/2017	859	Routine	Maintenance needed	Minor	Y
5/4/2017	884	Routine	Maintenance needed	Minor	Y
5/8/2017	178	Routine	Maintenance needed	Minor	Y
5/8/2017	179	Routine	Maintenance needed	Minor	Y
5/8/2017	606	Routine	Maintenance needed	Minor	Y
5/8/2017	607	Routine	Maintenance needed	Minor	Y
5/8/2017	892	Routine	No maintenance needed	None	N
5/8/2017	321	Routine	Maintenance needed	Major	Y
5/16/2017	53	Routine	No maintenance needed	None	N
5/16/2017	55	Routine	Maintenance needed	Minor	Y
5/16/2017	922	Routine	Maintenance needed	Minor	Y
5/17/2017	30	Routine	Maintenance needed	Minor	Y
5/17/2017	113	Routine	Maintenance needed	Minor	Y
5/17/2017	890	Routine	Maintenance needed	Minor	Y
5/17/2017	864	Routine	Maintenance needed	Minor	Y
5/17/2017	377	Routine	Maintenance needed	Minor	Y
5/17/2017	424	Routine	Maintenance needed	Minor	Y
5/18/2017	216	Routine	Maintenance needed	Minor	Y
5/18/2017	217	Routine	Maintenance needed	Minor	Y
5/18/2017	328	Routine	No maintenance needed	None	N
5/18/2017	532	Routine	No maintenance needed	None	N
5/18/2017	533	Routine	No maintenance needed	None	N
5/18/2017	318	Routine	Maintenance needed	Minor	Y
5/18/2017	505	Routine	Maintenance needed	Minor	Y
5/18/2017	128	Reinspection	Maintenance needed	Minor	Y
5/18/2017	321	Routine	Maintenance needed	Minor	Y
5/19/2017	329	Routine	Maintenance needed	Minor	Y
5/19/2017	894	Routine	Maintenance needed	Minor	Y
5/19/2017	837	Routine	Maintenance needed	Minor	Y
5/19/2017	191	Routine	Maintenance needed	Minor	Y
5/19/2017	394	Routine	Maintenance needed	Minor	Y

5/19/2017	667	Routine	Maintenance needed	Minor	Y
5/19/2017	74	Routine	Maintenance needed	Minor	Y
5/19/2017	456	Routine	Maintenance needed	Minor	Y
5/23/2017	601	Routine	Maintenance needed	Minor	Y
5/23/2017	406	Routine	Maintenance needed	Minor	Y
5/23/2017	425	Routine	Maintenance needed	Minor	Y
5/23/2017	22	Routine	Maintenance needed	Minor	Y
5/23/2017	50	Routine	Maintenance needed	Minor	Y
5/23/2017	329	Routine	Maintenance needed	Minor	Y
5/26/2017	563	Routine	Maintenance needed	Minor	Y
5/26/2017	551	Routine	Maintenance needed	Minor	Y
5/26/2017	2	Routine	Maintenance needed	Minor	Y
5/26/2017	3	Routine	Maintenance needed	Minor	Y
5/26/2017	335	Routine	Maintenance needed	Minor	Y
5/26/2017	599	Routine	Maintenance needed	Minor	Y
5/26/2017	66	Routine	Maintenance needed	Minor	Y
5/26/2017	697	Routine	Maintenance needed	Minor	Y
5/26/2017	4	Routine	Maintenance needed	Minor	Y
5/30/2017	872	Routine	Maintenance needed	Minor	Y
5/30/2017	873	Routine	Maintenance needed	Minor	Y
5/30/2017	871	Routine	Maintenance needed	Minor	Y
5/30/2017	253	Routine	Maintenance needed	Minor	Y
5/30/2017	368	Routine	Maintenance needed	Minor	Y
5/30/2017	202	Routine	Maintenance needed	Minor	Y
5/30/2017	806	Routine	Maintenance needed	Minor	Y
5/30/2017	698	Routine	No maintenance needed	None	N
5/30/2017	27	Routine	No maintenance needed	None	N
5/31/2017	399	Routine	No maintenance needed	None	N
5/31/2017	305	Routine	No maintenance needed	None	N
5/31/2017	306	Routine	No maintenance needed	None	N
5/31/2017	299	Routine	No maintenance needed	None	N
5/31/2017	195	Routine	No maintenance needed	None	N
5/31/2017	503	Routine	No maintenance needed	None	N
5/31/2017	126	Routine	No maintenance needed	None	N
5/31/2017	18	Routine	No maintenance needed	None	N
5/31/2017	471	Routine	No maintenance needed	None	N
5/31/2017	67	Routine	No maintenance needed	None	N
6/1/2017	807	Routine	Maintenance needed	Minor	Y
6/1/2017	17	Routine	No maintenance needed	None	N
6/1/2017	16	Routine	No maintenance needed	None	N
6/1/2017	536	Routine	No maintenance needed	None	N
6/1/2017	95	Routine	No maintenance needed	None	N
6/1/2017	96	Routine	No maintenance needed	None	N
6/1/2017	186	Routine	No maintenance needed	None	N
6/1/2017	847	Routine	No maintenance needed	None	N
6/1/2017	127	Routine	Maintenance needed	Major	Y

6/1/2017	846	Routine	No maintenance needed	None	N
6/1/2017	333	Routine	No maintenance needed	None	N
6/1/2017	382	Routine	No maintenance needed	None	N
6/1/2017	436	Routine	Maintenance needed	Minor	Y
6/1/2017	423	Routine	No maintenance needed	None	N
6/2/2017	346	Routine	No maintenance needed	None	N
6/2/2017	853	Routine	No maintenance needed	None	N
6/2/2017	345	Routine	No maintenance needed	None	N
6/2/2017	326	Routine	No maintenance needed	None	N
6/2/2017	80	Routine	No maintenance needed	None	N
6/2/2017	848	Routine	No maintenance needed	None	N
6/2/2017	81	Routine	No maintenance needed	None	N
6/2/2017	86	Routine	No maintenance needed	None	N
6/2/2017	148	Routine	Maintenance needed	Major	Y
6/2/2017	583	Routine	No maintenance needed	None	N
6/2/2017	149	Routine	Maintenance needed	Minor	Y
6/2/2017	150	Routine	No maintenance needed	None	N
6/5/2017	25	Routine	No maintenance needed	None	N
6/5/2017	534	Routine	No maintenance needed	None	N
6/5/2017	24	Routine	No maintenance needed	None	N
6/5/2017	293	Routine	No maintenance needed	None	N
6/5/2017	294	Routine	No maintenance needed	None	N
6/5/2017	54	Routine	No maintenance needed	None	N
6/5/2017	567	Routine	No maintenance needed	None	N
6/5/2017	580	Routine	No maintenance needed	None	N
6/5/2017	340	Routine	No maintenance needed	None	N
6/5/2017	559	Routine	No maintenance needed	None	N
6/5/2017	336	Routine	No maintenance needed	None	N
6/5/2017	339	Routine	No maintenance needed	None	N
6/5/2017	339	Routine	No maintenance needed	None	N
6/5/2017	338	Routine	No maintenance needed	None	N
6/5/2017	529	Routine	No maintenance needed	None	N
6/5/2017	852	Routine	No maintenance needed	None	N
6/5/2017	414	Routine	No maintenance needed	None	N
6/5/2017	151	Routine	No maintenance needed	None	N
6/5/2017	98	Routine	No maintenance needed	None	N
6/5/2017	483	Routine	No maintenance needed	None	N
6/5/2017	287	Routine	No maintenance needed	None	N
6/5/2017	517	Routine	No maintenance needed	None	N
6/5/2017	593	Complaint Based	No maintenance needed	None	N
6/5/2017	371	Routine	No maintenance needed	None	N
6/5/2017	907	Routine	No maintenance needed	None	N
6/5/2017	906	Routine	No maintenance needed	None	N
6/5/2017	172	Routine	No maintenance needed	None	N
6/5/2017	252	Complaint Based	Maintenance needed	Minor	Y
6/6/2017	374	Routine	Maintenance needed	Major	Y

6/6/2017	373	Routine	Maintenance needed	Minor	Y
6/6/2017	372	Routine	Maintenance needed	Major	Y
6/6/2017	379	Routine	No maintenance needed	None	N
6/6/2017	123	Routine	No maintenance needed	None	N
6/6/2017	124	Routine	No maintenance needed	None	N
6/6/2017	694	Routine	No maintenance needed	None	N
6/6/2017	51	Routine	No maintenance needed	None	N
6/6/2017	860	Routine	No maintenance needed	None	N
6/6/2017	861	Routine	No maintenance needed	None	N
6/6/2017	905	Routine	No maintenance needed	None	N
6/6/2017	904	Routine	No maintenance needed	None	N
6/6/2017	154	Routine	No maintenance needed	None	N
6/6/2017	157	Routine	No maintenance needed	None	N
6/6/2017	317	Routine	Maintenance needed	Major	Y
6/6/2017	924	Routine	No maintenance needed	None	N
6/6/2017	870	Routine	No maintenance needed	None	N
6/6/2017	68	Routine	No maintenance needed	None	N
6/6/2017	411	Routine	No maintenance needed	None	N
6/6/2017	89	Routine	Maintenance needed	Major	Y
6/6/2017	478	Routine	Maintenance needed	Major	Y
6/6/2017	465	Routine	No maintenance needed	None	N
6/6/2017	457	Routine	No maintenance needed	None	N
6/7/2017	673	Routine	Maintenance needed	Minor	Y
6/7/2017	674	Routine	Maintenance needed	Minor	Y
6/7/2017	672	Routine	Maintenance needed	Minor	Y
6/7/2017	677	Routine	Maintenance needed	Minor	Y
6/7/2017	680	Routine	Maintenance needed	Minor	Y
6/7/2017	678	Routine	No maintenance needed	None	N
6/7/2017	15	Routine	Maintenance needed	Minor	Y
6/7/2017	15	Routine	Maintenance needed	Minor	Y
6/7/2017	137	Routine	Maintenance needed	Minor	Y
6/7/2017	571	Routine	No maintenance needed	None	N
6/7/2017	139	Routine	No maintenance needed	None	N
6/7/2017	138	Routine	No maintenance needed	None	N
6/7/2017	556	Routine	Maintenance needed	Minor	Y
6/7/2017	115	Routine	No maintenance needed	None	N
6/7/2017	119	Routine	Maintenance needed	Major	Y
6/7/2017	133	Routine	Maintenance needed	Major	Y
6/7/2017	87	Routine	No maintenance needed	None	N
6/7/2017	555	Routine	Maintenance needed	Minor	Y
6/7/2017	117	Routine	No maintenance needed	None	N
6/7/2017	118	Routine	No maintenance needed	None	N
6/7/2017	156	Routine	No maintenance needed	None	N
6/7/2017	444	Routine	No maintenance needed	None	N
6/7/2017	369	Routine	No maintenance needed	None	N
6/7/2017	122	Routine	No maintenance needed	None	N

6/7/2017	136	Routine	No maintenance needed	None	N
6/7/2017	541	Routine	No maintenance needed	None	N
6/7/2017	135	Routine	No maintenance needed	None	N
6/7/2017	140	Routine	No maintenance needed	None	N
6/7/2017	497	Routine	No maintenance needed	None	N
6/7/2017	83	Routine	No maintenance needed	None	N
6/7/2017	82	Routine	No maintenance needed	None	N
6/7/2017	72	Routine	No maintenance needed	None	N
6/7/2017	370	Routine	No maintenance needed	None	N
6/7/2017	176	Routine	No maintenance needed	None	N
6/7/2017	226	Routine	No maintenance needed	None	N
6/7/2017	227	Routine	No maintenance needed	None	N
6/7/2017	228	Routine	No maintenance needed	None	N
6/7/2017	675	Routine	No maintenance needed	None	N
6/7/2017	676	Routine	No maintenance needed	None	N
6/7/2017	681	Routine	No maintenance needed	None	N
6/7/2017	679	Routine	No maintenance needed	None	N
6/8/2017	43	Routine	Maintenance needed	Major	Y
6/8/2017	94	Routine	No maintenance needed	None	N
6/8/2017	480	Routine	Maintenance needed	Minor	Y
6/8/2017	93	Routine	No maintenance needed	None	N
6/8/2017	12	Routine	No maintenance needed	None	N
6/8/2017	10	Routine	Maintenance needed	Minor	Y
6/8/2017	647	Routine	No maintenance needed	None	N
6/8/2017	34	Routine	No maintenance needed	None	N
6/8/2017	432	Routine	No maintenance needed	None	N
6/8/2017	33	Routine	No maintenance needed	None	N
6/8/2017	32	Routine	No maintenance needed	None	N
6/8/2017	114	Routine	No maintenance needed	None	N
6/8/2017	31	Routine	Maintenance needed	Major	Y
6/8/2017	375	Routine	No maintenance needed	None	N
6/8/2017	79	Routine	No maintenance needed	None	N
6/8/2017	635	Routine	No maintenance needed	None	N
6/8/2017	433	Routine	No maintenance needed	None	N
6/8/2017	361	Routine	No maintenance needed	None	N
6/8/2017	62	Routine	No maintenance needed	None	N
6/8/2017	65	Routine	Maintenance needed	Major	Y
6/8/2017	360	Routine	No maintenance needed	None	N
6/8/2017	696	Routine	No maintenance needed	None	N
6/8/2017	901	Routine	No maintenance needed	None	N
6/8/2017	298	Routine	No maintenance needed	None	N
6/9/2017	312	Routine	No maintenance needed	None	N
6/9/2017	881	Complaint Based	Maintenance needed	Minor	Y
6/9/2017	233	Routine	No maintenance needed	None	N
6/9/2017	45	Routine	No maintenance needed	None	N
6/9/2017	167	Routine	No maintenance needed	None	N

6/9/2017	899	Routine	No maintenance needed	None	N
6/9/2017	609	Routine	No maintenance needed	None	N
6/9/2017	898	Routine	No maintenance needed	None	N
6/9/2017	48	Routine	No maintenance needed	None	N
6/9/2017	430	Routine	No maintenance needed	None	N
6/12/2017	659	Routine	No maintenance needed	None	N
6/12/2017	608	Routine	No maintenance needed	None	N
6/12/2017	636	Routine	No maintenance needed	None	N
6/12/2017	107	Routine	No maintenance needed	None	N
6/12/2017	97	Routine	No maintenance needed	None	N
6/12/2017	502	Routine	No maintenance needed	None	N
6/12/2017	603	Routine	No maintenance needed	None	N
6/12/2017	42	Routine	No maintenance needed	None	N
6/12/2017	100	Routine	No maintenance needed	None	N
6/12/2017	304	Routine	No maintenance needed	None	N
6/12/2017	303	Routine	No maintenance needed	None	N
6/12/2017	362	Routine	No maintenance needed	None	N
6/13/2017	459	Routine	No maintenance needed	None	N
6/13/2017	458	Routine	No maintenance needed	None	N
6/13/2017	868	Routine	No maintenance needed	None	N
6/13/2017	866	Routine	No maintenance needed	None	N
6/13/2017	867	Routine	No maintenance needed	None	N
6/13/2017	297	Routine	No maintenance needed	None	N
6/13/2017	920	Routine	No maintenance needed	None	N
6/14/2017	911	Routine	No maintenance needed	None	N
6/14/2017	912	Routine	No maintenance needed	None	N
6/14/2017	269	Routine	No maintenance needed	None	N
6/14/2017	854	Routine	Maintenance needed	Minor	Y
6/14/2017	921	Routine	Maintenance needed	Major	Y
6/14/2017	64	Routine	No maintenance needed	None	N
6/14/2017	11	Routine	No maintenance needed	None	N
6/14/2017	334	Routine	No maintenance needed	None	N
6/14/2017	132	Routine	No maintenance needed	None	N
6/14/2017	800	Routine	No maintenance needed	None	N
6/15/2017	189	Routine	No maintenance needed	None	N
6/15/2017	916	Routine	No maintenance needed	None	N
6/15/2017	284	Routine	No maintenance needed	None	N
6/15/2017	501	Routine	No maintenance needed	None	N
6/15/2017	41	Routine	No maintenance needed	None	N
6/15/2017	484	Routine	No maintenance needed	None	N
6/15/2017	452	Routine	No maintenance needed	None	N
6/15/2017	188	Routine	No maintenance needed	None	N
6/15/2017	547	Routine	No maintenance needed	None	N
6/15/2017	49	Routine	No maintenance needed	None	N
6/16/2017	129	Routine	No maintenance needed	None	N
6/16/2017	131	Routine	Maintenance needed	Major	Y

6/16/2017	130	Routine	No maintenance needed	None	N
6/16/2017	161	Routine	No maintenance needed	None	N
6/16/2017	656	Routine	No maintenance needed	None	N
6/19/2017	592	Routine	No maintenance needed	None	N
6/19/2017	40	Routine	No maintenance needed	None	N
6/20/2017	168	Routine	No maintenance needed	None	N
6/20/2017	380	Routine	No maintenance needed	None	N
6/20/2017	359	Routine	No maintenance needed	None	N
6/20/2017	419	Routine	No maintenance needed	None	N
6/20/2017	261	Routine	No maintenance needed	None	N
6/20/2017	260	Routine	No maintenance needed	None	N
6/20/2017	263	Routine	Maintenance needed	Major	Y
6/20/2017	264	Routine	Maintenance needed	Major	Y
6/20/2017	259	Routine	No maintenance needed	None	N
6/20/2017	268	Routine	Maintenance needed	Major	Y
6/20/2017	257	Routine	No maintenance needed	None	N
6/21/2017	341	Routine	No maintenance needed	None	N
6/21/2017	342	Routine	No maintenance needed	None	N
6/21/2017	347	Routine	No maintenance needed	None	N
6/21/2017	928	Routine	No maintenance needed	None	N
6/21/2017	331	Routine	No maintenance needed	None	N
6/21/2017	355	Routine	No maintenance needed	None	N
6/21/2017	420	Routine	No maintenance needed	None	N
6/21/2017	275	Routine	No maintenance needed	None	N
6/21/2017	274	Routine	No maintenance needed	None	N
6/26/2017	319	Routine	Maintenance needed	Major	Y
6/26/2017	26	Routine	No maintenance needed	None	N
6/26/2017	855	Routine	No maintenance needed	None	N
6/26/2017	856	Routine	No maintenance needed	None	N
6/26/2017	857	Routine	Maintenance needed	Minor	Y
6/26/2017	194	Routine	No maintenance needed	None	N
6/26/2017	193	Routine	No maintenance needed	None	N
6/26/2017	9	Routine	Maintenance needed	Major	Y
6/26/2017	693	Routine	Maintenance needed	Minor	Y
6/27/2017	417	Routine	No maintenance needed	None	N
6/27/2017	413	Routine	No maintenance needed	None	N
6/27/2017	381	Routine	Maintenance needed	Major	Y
6/27/2017	475	Routine	No maintenance needed	None	N
6/27/2017	180	Routine	Maintenance needed	Minor	Y
6/27/2017	429	Routine	No maintenance needed	None	N
6/27/2017	658	Routine	No maintenance needed	None	N
6/28/2017	351	Routine	No maintenance needed	None	N
6/28/2017	617	Routine	No maintenance needed	None	N
6/28/2017	8	Routine	Maintenance needed	Minor	Y
6/28/2017	7	Routine	Maintenance needed	Minor	Y
6/28/2017	473	Routine	No maintenance needed	None	N

6/30/2017	262	Complaint Based	Maintenance needed	Minor	Y

Summary of Routines
Annual Reporting Period

Count	Date of Routine	Facility #	Routine Type	Comments	Maintenance Required	Owner 60 Day Ltr (Y/N)	CA 30 Day Ltr	CA 15 Day Ltr
1	7/5/2016	5099	Site Meeting	Discussed work with HOA	Minor	Y		
2	7/5/2016	5986	Routine	No maintenance needed	None	N		
3	7/5/2016	5987	Routine	No maintenance needed	None	N		
4	7/11/2016	5200	Re-Inspection	Construction Estimate needed	Minor	Y		
5	7/11/2016	5245	Re-Inspection	Construction Estimate needed	Minor	Y		
6	7/11/2016	5477	Re-Inspection	Closed Out	None	N		
7	7/15/2016	5950	Routine	No maintenance needed	None	N		
8	7/15/2016	5951	Routine	No maintenance needed	None	N		
9	7/15/2016	5952	Routine	No maintenance needed	None	N		
10	7/15/2016	5953	Routine	No maintenance needed	None	N		
11	7/15/2016	5954	Routine	No maintenance needed	None	N		
12	7/19/2016	5832	Routine	No maintenance needed	None	N		
13	7/19/2016	5833	Routine	No maintenance needed	None	N		
14	7/19/2016	5871	Routine	No maintenance needed	None	N		
15	7/19/2016	5988	Routine	No maintenance needed	None	N		
16	7/19/2016	5989	Routine	No maintenance needed	None	N		
17	7/20/2016	5042	Re-Inspection	No work done. Jessica to follow up	Minor	Y		
18	7/20/2016	5099	Re-Inspection	Closed Out	None	N		
19	7/20/2016	5990	Routine	Maintenance needed	Minor	Y		
20	7/20/2016	5991	Routine	Maintenance needed	Minor	Y		
21	7/21/2016	5350	Routine	No maintenance needed	None	N		
22	7/21/2016	5355	Routine	Maintenance needed	Minor	Y		
23	7/25/2016	5291	Routine	No maintenance needed	None	N		
24	7/25/2016	5292	Routine	No maintenance needed	None	N		
25	7/25/2016	5301	Re-Inspection	Closed Out	None	N		
26	7/25/2016	5345	Routine	Maintenance needed	Minor	Y		
27	7/26/2016	5373	Re-Inspection	Work completed	None	N		
28	7/26/2016	5608	Re-Inspection	Work completed	None	N		
29	8/1/2016	5083	Re-Inspection	Closed Out	None	N		
30	8/1/2016	5084	Re-Inspection	Contacted owner, work in progress	Minor	Y		
31	8/1/2016	5092	Routine	No maintenance needed	None	N		
32	8/1/2016	5242	Routine	Maintenance needed	Minor	Y		
33	8/5/2016	5514	Re-Inspection	Closed Out	None	N		
34	8/16/2016	5999	Routine	Maintenance needed	Minor	Y		
35	8/17/2016	5019	Routine	Maintenance needed	Minor	Y		
36	8/17/2016	5020	Routine	Maintenance needed	Minor	Y		
37	8/17/2016	5021	Routine	Maintenance needed	Minor	Y		
38	8/17/2016	5022	Routine	Maintenance needed	Minor	Y		
39	8/17/2016	5023	Routine	Maintenance needed	Minor	Y		
40	8/17/2016	5024	Routine	Maintenance needed	Minor	Y		
41	8/17/2016	5025	Routine	Maintenance needed	Minor	Y		
42	8/17/2016	5026	Routine	Maintenance needed	Minor	Y		
43	8/17/2016	5027	Routine	Maintenance needed	Minor	Y		
44	8/17/2016	5028	Routine	Maintenance needed	Minor	Y		
45	8/17/2016	5029	Routine	Maintenance needed	Minor	Y		
46	8/17/2016	5030	Routine	Maintenance needed	Minor	Y		
47	8/17/2016	5031	Routine	Maintenance needed	Minor	Y		
48	8/17/2016	5367	Routine	Maintenance needed	Minor	Y		
49	8/17/2016	5368	Routine	Maintenance needed	Minor	Y		
50	8/22/2016	5084	Site Meeting	Met with owner to discuss work	Minor	Y		
51	8/22/2016	5402	Routine	Maintenance needed	Minor	Y		

Count	Date of Routine	Facility #	Routine Type	Comments	Maintenance Required	Owner 60 Day Ltr (Y/N)	CA 30 Day Ltr	CA 15 Day Ltr
52	8/22/2016	5405	Routine	Maintenance needed	Minor	Y		
53	8/22/2016	5406	Routine	Maintenance needed	Minor	Y		
54	8/22/2016	5407	Routine	Maintenance needed	Minor	Y		
55	8/29/2016	5978	Routine	No maintenance needed	None	N		
56	8/29/2016	5979	Routine	No maintenance needed	None	N		
57	8/29/2016	5980	Routine	No maintenance needed	None	N		
58	8/29/2016	5984	Routine	No maintenance needed	None	N		
59	8/29/2016	5985	Routine	No maintenance needed	None	N		
60	9/2/2016	5056	Routine	No maintenance needed	None	N		
61	9/2/2016	5060	Routine	Maintenance needed	Minor	Y		
62	9/2/2016	5061	Routine	Maintenance needed	Minor	Y		
63	9/2/2016	5062	Routine	Maintenance needed	Minor	Y		
64	9/2/2016	5289	Routine	No maintenance needed	None	N		
65	9/7/2016	5200	Re-Inspection	Closed Out	None	N		
66	9/7/2016	5245	Re-Inspection	Closed Out	None	N		
67	9/16/2016	5535	Re-Inspection	Construction Estimate needed	Minor	Y		
68	9/16/2016	5536	Re-Inspection	Construction Estimate needed	Minor	Y		
69	9/16/2016	5537	Re-Inspection	Construction Estimate needed	Minor	Y		
70	9/16/2016	5538	Re-Inspection	Construction Estimate needed	Minor	Y		
71	9/16/2016	5539	Re-Inspection	Construction Estimate needed	Minor	Y		
72	9/16/2016	5540	Re-Inspection	Construction Estimate needed	Minor	Y		
73	9/16/2016	5936	Site Meeting	Met with owner to discuss work	Minor	Y		
74	9/22/2016	5992	Routine	Maintenance needed	Minor	Y		
75	9/22/2016	5993	Routine	Maintenance needed	Minor	Y		
76	9/22/2016	5994	Routine	Maintenance needed	Minor	Y		
77	9/22/2016	5995	Routine	Maintenance needed	Minor	Y		
78	9/22/2016	5996	Routine	Maintenance needed	Minor	Y		
79	9/22/2016	5997	Routine	Maintenance needed	Minor	Y		
80	9/22/2016	5998	Routine	Maintenance needed	Minor	Y		
81	9/26/2016	5088	Routine	Maintenance needed	Minor	Y		
82	9/26/2016	5089	Routine	Maintenance needed	Minor	Y		
83	9/26/2016	5090	Routine	Maintenance needed	Minor	Y		
84	9/26/2016	5091	Routine	Maintenance needed	Minor	Y		
85	9/27/2016	5148	Complaint	Forwarded to NSD	None	N		
86	10/4/2016	6000	Routine	Maintenance needed	Minor	Y		
87	10/4/2016	6001	Routine	Maintenance needed	Minor	Y		
88	10/4/2016	6002	Routine	Maintenance needed	Minor	Y		
89	10/4/2016	5980	Routine	Work complete	Minor	Y		
90	10/6/2016	5235	Routine	Maintenance needed	Major	Y		
91	10/6/2016	5948	Routine	Maintenance needed	Minor	Y		
92	10/6/2016	5949	Routine	Maintenance needed	Minor	Y		
93	10/7/2016	6003	Routine	Maintenance needed	Minor	Y		
94	10/7/2016	6004	Routine	No maintenance needed	None	N		
95	10/7/2016	5831	Routine	Maintenance needed	Minor	Y		
96	10/7/2016	5979	Reinspection	Work complete	None	N		
97	10/7/2016	5978	Reinspection	Work complete	None	N		
98	10/18/2016	6005	Routine	No maintenance needed	None	N		
99	10/18/2016	6006	Routine	No maintenance needed	None	N		
100	10/18/2016	5360	Reinspection / SM	Maintenance needed	Minor	Y		
101	10/18/2016	5226	Routine	Maintenance needed	Minor	Y		
102	11/3/2016	5992	Reinspection	Maintenance needed	Minor	Y		
103	11/3/2016	5993	Reinspection	Maintenance needed	Minor	Y		
104	11/10/2016	5994	Reinspection	Maintenance needed	Minor	Y		
105	11/10/2016	5995	Reinspection	Maintenance needed	Minor	Y		

Count	Date of Routine	Facility #	Routine Type	Comments	Maintenance Required	Owner 60 Day Ltr (Y/N)	CA 30 Day Ltr	CA 15 Day Ltr
106	11/10/2016	5996	Reinspection	Maintenance needed	Minor	Y		
107	11/10/2016	5997	Reinspection	Maintenance needed	Minor	Y		
108	11/10/2016	5998	Reinspection	Maintenance needed	Minor	Y		
109	11/10/2016	5999	Reinspection	Maintenance needed	Minor	Y		
110	11/10/2016	5936	Re-Inspection	Maintenance needed	Minor	Y		
111	11/16/2016	5084	Re-Inspection	Work complete	Minor	Y		
112	11/22/2016	5244	Re-Inspection	Maintenance needed	Minor	Y		
113	12/2/2016	5263	Re-Inspection	Work complete	None	N		
114	12/2/2016	5244	Construction Estimate	Maintenance needed	Minor	Y		
115	12/14/2016	5535	Construction Estimate	Maintenance needed	Minor	Y		
116	12/21/2016	5536	Construction Estimate	Maintenance needed	Minor	Y		
117	12/21/2016	5537	Construction Estimate	Maintenance needed	Minor	Y		
118	12/21/2016	5538	Construction Estimate	Maintenance needed	Minor	Y		
119	12/21/2016	5539	Construction Estimate	Maintenance needed	Minor	Y		
120	12/21/2016	5540	Construction Estimate	Maintenance needed	Minor	Y		
121	12/22/2016	5402	Re-Inspection	Closed out	Minor	Y		
122	12/22/2016	5273	Routine	Maintenance needed	Minor	Y		
123	12/22/2016	5386	Routine	Maintenance needed	Minor	Y		
124	12/22/2016	5576	Routine	Maintenance needed	Minor	Y		
125	12/22/2016	5577	Routine	Maintenance needed	Minor	Y		
126	12/22/2016	5578	Routine	Maintenance needed	Minor	Y		
127	12/22/2016	5579	Routine	Maintenance needed	Minor	Y		
128	12/22/2016	5580	Routine	Maintenance needed	Minor	Y		
129	1/6/2017	5277	Routine	No work needed	None	Y		
130	1/11/2017	5996	Reinspection / SM	Work needed	Minor	Y		
131	1/11/2017	5993	Reinspection / SM	Work needed	Minor	Y		
132	1/11/2017	5998	Reinspection / SM	Work needed	Minor	Y		
133	1/11/2017	5999	Reinspection / SM	Work needed	Minor	Y		
134	1/31/2017	5990	Reinspection	Work complete	None	N		
135	1/31/2017	5991	Reinspection	Work complete	None	N		
136	2/3/2017	5298	Reinspection / SM	Met with property owners	Minor	Y		
137	2/3/2017	5130	Routine	Work needed / Major	Major	Y		
138	2/3/2017	5243	Routine	Work needed	Minor	Y		
139	2/3/2017	6009	Routine	No work needed	None	Y		
140	2/7/2017	5400	Routine	Work needed	Minor	Y		
141	2/7/2017	6007	Routine	Work needed	Minor	Y		
142	2/7/2017	6008	Routine	Work needed	Minor	Y		
143	2/7/2017	6010	Routine	No work needed	None	N		
144	2/7/2017	6011	Routine	No work needed	None	N		
145	2/7/2017	6012	Routine	No work needed	None	N		
146	2/7/2017	6013	Routine	No work needed	None	N		
147	2/7/2017	6014	Routine	No work needed	None	N		
148	2/7/2017	6015	Routine	No work needed	None	N		
149	2/7/2017	6017	Routine	No work needed	None	N		
150	2/15/2017	5982	Reinspection	Work complete	None	N		
151	2/16/2017	5079	Routine	Work needed	Minor	Y		
152	2/23/2017	5066	Routine	Work needed	Minor	Y		
153	2/23/2017	6019	Routine	No work needed	None	Y		
154	2/23/2017	6020	Routine	No work needed	None	Y		
155	2/24/2017	6018	Routine	No work needed	None	Y		
156	2/28/2017	5720	Routine	Work needed	Minor	Y		
157	2/28/2017	5013	Routine	Work needed	Minor	Y		
158	2/28/2017	5014	Routine	Work needed	Minor	Y		
159	2/28/2017	5012	Routine	Work needed	Minor	Y		

Count	Date of Routine	Facility #	Routine Type	Comments	Maintenance Required	Owner 60 Day Ltr (Y/N)	CA 30 Day Ltr	CA 15 Day Ltr
160	5723	2/28/2017	Routine	Work needed	Minor	Y		
161	5720	2/28/2017	Routine	Work needed	Minor	Y		
162	5718	2/28/2017	Routine	Work needed	Minor	Y		
163	5722	2/28/2017	Routine	Work needed	Minor	Y		
164	5719	2/28/2017	Routine	Work needed	Minor	Y		
165	5717	2/28/2017	Routine	Work needed	Minor	Y		
166	5716	2/28/2017	Routine	Work needed	Minor	Y		
167	5010	2/28/2017	Routine	Work needed	Minor	Y		
168	5011	2/28/2017	Routine	Work needed	Minor	Y		
169	5015	2/28/2017	Routine	Work needed	Minor	Y		
170	5226	3/8/2017	Reinspection	Crew onsite working	Minor	Y		
171	5159	3/17/2017	Routine	Facility Eliminated	None	N		
172	5831	3/17/2017	Reinspection	Work complete	None	N		
173	5160	3/17/2017	Routine	Work needed	Minor	Y		
174	5223	3/17/2017	Routine	Work needed	Minor	Y		
175	5089	3/21/2017	Complaint	No work needed	None	N		
176	5226	3/23/2017	Reinspection	Work complete	None	N		
177	6021	3/29/2017	Routine	Work needed	Minor	Y		
178	6023	3/29/2017	Routine	Work needed	Minor	Y		
179	5891	3/29/2017	Routine	No work needed	None	N		
180	5996	4/7/2017	Reinspection	Work completed	None	N		
181	5997	4/7/2017	Reinspection	Work completed	None	N		
182	5998	4/7/2017	Reinspection	Work completed	None	N		
183	5999	4/7/2017	Reinspection	Work completed	None	N		
184	5129	4/26/2017	Routine	No work needed	None	N		
185	5939	4/27/2017	Routine	Work needed	Minor	Y		
186	5940	4/27/2017	Routine	Work needed	Minor	Y		
187	6026	4/27/2017	Routine	Work needed	Minor	Y		
188	6024	4/27/2017	Routine	No work needed	None	N		
189	6027	4/27/2017	Routine	No work needed	None	N		
190	5383	4/28/2017	Routine	Eliminated	None	N		
191	5889	4/28/2017	Routine	No work needed	None	N		
192	5890	4/28/2017	Routine	Work needed	Minor	Y		
193	5752	4/28/2017	Reinspection / SM	Met with owner and contractor	Major	N		
194	5031	5/8/2017	Reinspection	Work completed	None	N		
195	5030	5/8/2017	Reinspection	Work completed	None	N		
196	5028	5/8/2017	Reinspection	Work completed	None	N		
197	5027	5/8/2017	Reinspection	Work completed	None	N		
198	5024	5/8/2017	Reinspection	Work completed	None	N		
199	5023	5/8/2017	Reinspection	Work completed	None	N		
200	5020	5/8/2017	Reinspection	Work completed	None	N		
201	5019	5/8/2017	Reinspection	Work completed	None	N		
202	5021	5/8/2017	Reinspection	Work completed	None	N		
203	5022	5/8/2017	Reinspection	Work completed	None	N		
204	5026	5/8/2017	Reinspection	Work completed	None	N		
205	5702	5/22/2017	Routine	No work needed	None	N		
206	5703	5/22/2017	Routine	No work needed	None	N		
207	5704	5/22/2017	Routine	No work needed	None	N		
208	5705	5/22/2017	Routine	No work needed	None	N		
209	5420	5/22/2017	Routine	No work needed	None	N		
210	5367	5/22/2017	Routine	No work needed	None	N		
211	5368	5/22/2017	Routine	No work needed	None	N		
212	5932	5/23/2017	Routine	Work needed	Minor	Y		
213	5001	5/23/2017	Routine	No work needed	None	Y		

Technical Manual
MS4 Delineation & Stormwater Tool

Prepared for:

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Prince William, Virginia

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Project No. 151270001

1 Introduction

Prince William County (the County) hired Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) to analyze geospatial data depicting the County's stormwater network in order to delineate the total area drained by their Municipal Separate Stormsewer System (MS4). This process involved the identification of regulated MS4 outfalls – that is, stormwater outfalls owned or operated by Prince William County that discharge to waters of the United States. Amec Foster Wheeler assigned one of five ownership classes to each outfall: County, Homeowners, Commercial entities, Virginia Department of Transportation (VDOT), and Other owners. Typically, regulated MS4 outfalls were placed at the terminus of infrastructure (e.g. stormsewers, BMPs) and ownership was assigned using classification codes stored within the attribute tables of the spatial data provided by the County. Stormsewer ownership was determined using the coded values within the "SYM" field, while BMP ownership was determined using the "MAINT" field values. Regulated MS4 outfalls were placed before the terminus of the infrastructure if terminal placement would result in drainage area delineations that ernoeously captured jurisdictional waters and their riparian areas (rather than solely MS4 service area). Secondarily, parcel ownership and easement records were used to determine ownership if existing infrastructure data was not available.

Over 4,800 outfalls were identified, 3,495 of which were assigned County ownership. Based on this regulated MS4 outfall determination, the County's MS4 service area totals 23,156 acres. These regulated MS4 outfalls serve as a crucial input for the Stormwater Tool to function. The Stormwater Tool delineates the pervious and impervious drainage area to each outfall, creating a dataset that can be analyzed by the user to determine the County's MS4 service area as infrastructure is added to the County's database. Specifically, the Stormwater Tool provides the necessary information to meet *Part I.B.2.h) 3-4* of the County's MS4 Permit (Permit No: VA0088595).

2 Purpose and Objectives

This manual provides a guide for using the Stormwater Tool to delineate Prince William County's MS4 service area. The following sections of the report explain:

1) The structure of the Stormwater Tool and pertinent spatial data;
2) The three scripts composing the Stormwater Tool;
3) Maintining the data utilized by the Stormwater Tool allowing for future integration in stormwater planning activities as the County's network expands;
4) An example exercise for a small region of the County's stormwater network.

The objective of this document is to provide any potential user with basic GIS experience the ability to use the Stormwater Tool and receive an output of the MS4 drainage area for selected outfalls. Users with a stronger background in GIS and geospatial processing will be able to further

customize the Stormwater Tool, if desired, by modfying the source code provided to the County. Amec Foster Wheeler has provided a functional, efficient tool that automates a laborious, yet critical step in ensuring the County meets its regulatory requirements and ultimately improves water quality within the Chesapeake Bay.

3 Stormwater Tool Structure

Amec Foster Wheeler provided the finished tool to the County on a flashdrive. A folder titled "MS4" houses the complete Stormwater Tool. The ArcGIS processing component of the Stormwater Tool consists of three scriptsstored in the "Stormwater Tool" toolbox. The folder also contains the primary geodatabase, "MS4.gdb", and a scratch geodatabase, "scratch.gdb". Note that scratch.gdb is created upon running any of the three scripts in the Stormwater Tool. Three source code python scripts are stored within MS4.gdb and are utilized by scripts in the toolbox. The location of the source code scripts is paramount because the scripts rely on relative pathname connections to interact with relevant data stored in the MS4 geodatabase. Moving the scripts to a new location without further modification to the source code will cause the Stormwater Tool to fail.

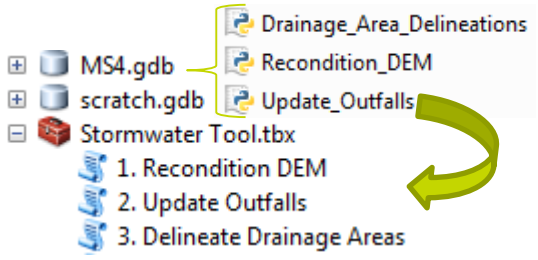


Figure 1 Python Script Storage Location

Users can interact with the three scripts in the Stormwater Tool toolbox directly in ArcMap. The scripts open like native ArcGIS tools and should be run in sequential order:

1. Recondition DEM
2. Update Outfalls
3. Delineate Drainage Areas

NOTE: This document will refer to the Stormwater Tool, which is the suite of ArcGIS tools developed by Amec Foster Wheeler for the County to delineate their MS4 Service Area. The three scripts within this suite will be referred to as "components". Also, one should not confuse the Stormwater Tool or its components with the native ArcGIS tools alluded to further on in this manual.

4 Geodatabase Setup

There are two geodatabases contained within the Stormwater Tool folder:

- **MS4.gdb** contains the necessary inputs (both native and user-specified) as well as the final outputs of the Stormwater Tool. Contained within MS4.gdb are several feature datasets and feature classes the user should familiarize themselves with before using the Stormwater Tool:

- **Interconnected** contains areas that should not be included in the County's MS4 area because they are either excluded per the DEQ Guidance Memo No 15-2005 or regulated under a separate MS4 permit.
  - *VPDES* – Parcels that are regulated under General or individual VPDES permits.
  - *VDOT* – Right-of-way that VDOT claimed as their MS4 area within the County.
  - *GMU* – George Mason University parcel which is regulated by a separate MS4 permit.
  - *Schools* – Parcels owned by Prince William County Public Schools, which are regulated by a separate MS4 permit.
  - *NOVA* – Northern Virginia Community College parcel which is regulated by a separate MS4 permit.
  - *Forested* - Forested lands excluded from the MS4 regulated area. These were delineated from 4-band multispectral imagery at 1 meter spatial resolution. See Appendix B for further information.

NOTE: There are other interconnected MS4s (City of Manassas, Marine Corps Base Quantico, et al.) whose MS4 service area was not available. These can be incorporated into the tool at a later date. Amec Foster Wheeler determined that the County MS4 Service Area did not capture any significant area that would be "double counted".

- **LandUse** contains the impervious surface area for the County. These areas are used to calculate the percent of delineated MS4 drainage areas that are impervious.
  - *Impervious2009* – Impervious surface feature class for Prince William County as of June 30th, 2009. This feature class should be used to meet Phase 1 of the Chesapeake Bay TMDL.
  - *Impervious2012* – Current impervious surface feature class available for Prince William County. This feature class could be used in MS4 service area delineations for future TMDL action plans, as needed.
- **Network** contains two polyline files: the County stormwater network and customized NHD Flowlines. Both of these polylines are used to recondition the DEM and form a unified drainage network.
  - *Amec_Single_Network* – Modified County stormsewer feature class that establishes hydrologic connectivity between the County stormsewer

system and the stream network. It includes both the County stormsewer system and hydrologic connections to the stream network, both of which were edited by Amec Foster Wheeler under direction from the County. MS4 and BMP outfalls are snapped to this feature class.

- *NHD_flowlines* – Modified version of the NHD high-resolution (24K) flowlines. This feature class serves as the unidirectional stream network for Prince William County. Each segment of the NHD contains a unique identifier, or "REACHCODE" as it is stored within the attribute table, which is identified as the downstream receiving waterbody in the "2. Update Outfalls" script. Modification of the original NHD flowlines involved deleting specific segments that were either buried or heavily modified with BMPs during development. The position of NHD flowlines were occasionally adjusted to reflect more accurate flow patterns apparent within the LiDAR DEM.

- **Outfalls** contains feature classes that can be used as drainage delineation points for delineating drainage areas. The Stormwater Tool will update the attribute data for each outfall to include a unique ID, its latitude and longitude in decimal degrees, the local watershed (WTRSHD_ID), the 5th and 6th order VA HUC, the HUC12, and the waterbody receiving outflow (listed as a REACHCODE). Outfalls also contain ownership and maintenance responsibility information.

  - *ms4_outfalls* – Feature class consisting of points demarcating where MS4 discharges to waters of the United States. Outfall ownership and "origin" (referring to the infrastructure or data that characterized the point as an MS4 outfall, ex. rip-rap ditch) are assigned upon creation by the user according to preset domains.

  - *BMPs* – Feature class containing the outfalls for the County's legacy BMPs. While the Stormwater Tool was designed for determining the MS4 Service Area, it can also be used for determining drainage areas for each historic BMP. Care should be taken when using the Stormwater Tool for the BMPs to ensure proper drainage area delineation.

- **Polygons** contains several feature classes including MS4 drainage areas and watersheds. Important outputs can be stored in this feature dataset.

  - *Subwatersheds* – Input for the "2. Update Outfalls" script that provides the local watershed draining each outfall (WTRSHD_ID).

  - *HUC12* – Input for the "2. Update Outfalls" script that provides the HUC 12 from the NHD draining each outfall.

- *BMP_da* – Pervious and impervious drainage area for each BMP. Note that several BMPs capture entire stream valleys which would not be considered regulated MS4 service area.
- *MS4_Service_Area* – Total MS4 service area in the County attributed to the five ownership & maintenance classes. Each delineated MS4 area includes: ownership, origin, corresponding outfall ID, HUC12, local watershed (WTRSHD_ID), total drainage area (acres), pervious drainage area (acres), and impervious drainage area (acres).

- **Raster data** contains inputs and outputs (in raster format) utilized for delineating drainage areas.
  - *burned* – Hydrologically conditioned 3-meter resolution DEM. NHD_flowlines and Amec_Single_Network are "burned" into this DEM to enforce proper hydrologic routing of the stormsewer network. This process is explained in Section 5.1.
  - *Dem_3 meter* – 3-meter resolution digital elevation model for the County obtained from the National Elevation Dataset (NED). The NED is a seamless mosaic of best-available elevation data that is maintained by the USGS. This high-resolution elevation data provides a realistic depiction of the County's topography and serves as the basis for hydrologic routing in the Stormwater Tool.
  - *Flow_acc* – Flow accumulation raster based on the burned, hydrologically reconditioned DEM created during the "1. Recondition DEM" script. Information stored within each cell provides the accumulated flow upstream of that point.
  - *Flow_dir* - Flow direction raster based on the burned, hydrologically reconditioned DEM created during the "1. Recondition DEM" script. The D8 flow algorithm is used to assign flow direction to each cell. The resulting flow direction grid is used to assign drainage areas to each outfall.

- **Scratch.gdb** contains intermediate outputs of the Stormwater Tool, and can be cleared out after each run if desired. This serves as a "background" where these intermediate outputs can be accessed by the Stormwater Tool without creating clutter within MS4.gdb.

5 Stormwater Tool Components

5.1 DEM Reconditioning

A digital elevation model (DEM) is a 3-D representation of the Earth's surface. DEMs have been used for a number of geospatial applications, including modeling surface water hydrology. Surface water hydrology is relatively easy to model in natural environments; however, urban environments present additional challenges. Namely, manmade infrastructure (i.e. stormwater pipes, curb inlets, and drainage ditches) substantially alters the natural drainage network and can transfer water between subwatersheds.

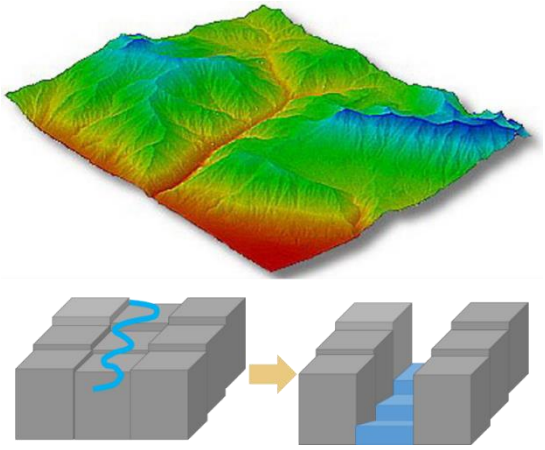


Figure 2 Burning in Hydrologic Network

Since a DEM depicts the Earth's surface using a rectangular grid of cells, it struggles to depict the below ground stormwater network and small hydrologic features that often drain urban environments. Consequently, it's necessary to lower the elevation of cells in the DEM containing urban hydrologic features to ensure accurate flowpaths are reflected across the County. This elevation modification is often referred to as "burning".

This DEM reconditioning process can be achieved using the *"1. Recondition DEM"* component in the Stormwater Tool toolbox. It merges the vector NHD flowlines and Amec Single Network to create a rasterized version of this contiguous hydrologic network. The rasterized hydrologic network serves as a mask, and each hydrologic network grid cell is lowered (-3000 feet for stream cells and -2000 feet for Amec Single Network cells) in the DEM relative to neighboring cells that are not within the hydrologic network (i.e. land not within a streamchannel). Essentially, this process cuts a network of canyons into the DEM surface along cells coincident with the merged hydrologic network, which then serves to redirect local drainage into these digitally carved hydrologic network channels.

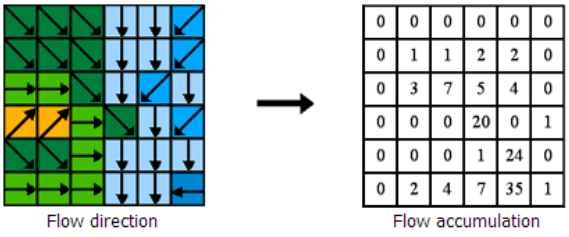


Figure 3 Source: ArcGIS Resources

Depressions and flat areas are then removed using a depression filling technique to create a hydrologically corrected DEM. The corrected DEM reflects a continuously, monotonically descending flowpath connecting each grid cell to the data edge, with burned-in canyons coincident with the mapped hydrologic network. The hydrologically corrected DEM is then used to determine local drainage direction and flow accumulation (upslope drainage area). The local drainage direction, or flow direction, is calculated using an algorithm, which

directs flow from each cell to its steepest downslope neighboring cell. This flow algorithm uses information about local surface gradient and orientation, calculated from the DEM, to model spatial patterns of flow direction. Flow accumulation is then calculated for each cell by summing the number of cells that flow into each downslope cell. This component creates three outputs: a flow direction raster, a flow accumulation raster, and a hydrologically corrected DEM. These outputs are all stored in MS4.gdb and are used by subsequent components in the Stormwater Tool toolbox.

5.2 Update Outfalls

The County is responsible for mapping the MS4 service area and each MS4 outfall in accordance with *Part I.B.2.h)* of MS4 Permit No. VA0088595. Specifically, the County must track the information contained in Figure 4 for each MS4 outfall and its corresponding drainage area.The *"2. Update Outfalls"* component in the Stormwater Tool toolbox updates this information for each outfall and stores the data in the attribute table as shown below.

Figure 4 Outfall Attribution

Reporting Requirement	Field Name in Attribute Table
Individual Identification Number	"Outfall_ID"
Local Watershed	"WTRSHD_ID"
Sixth Order HUC	"VAHU6"
Receiving Water	"REACHCODE"
Latitude in Decimal Degrees	"Lat_DD"
Longitude in Decimal Degrees	"Long_DD"

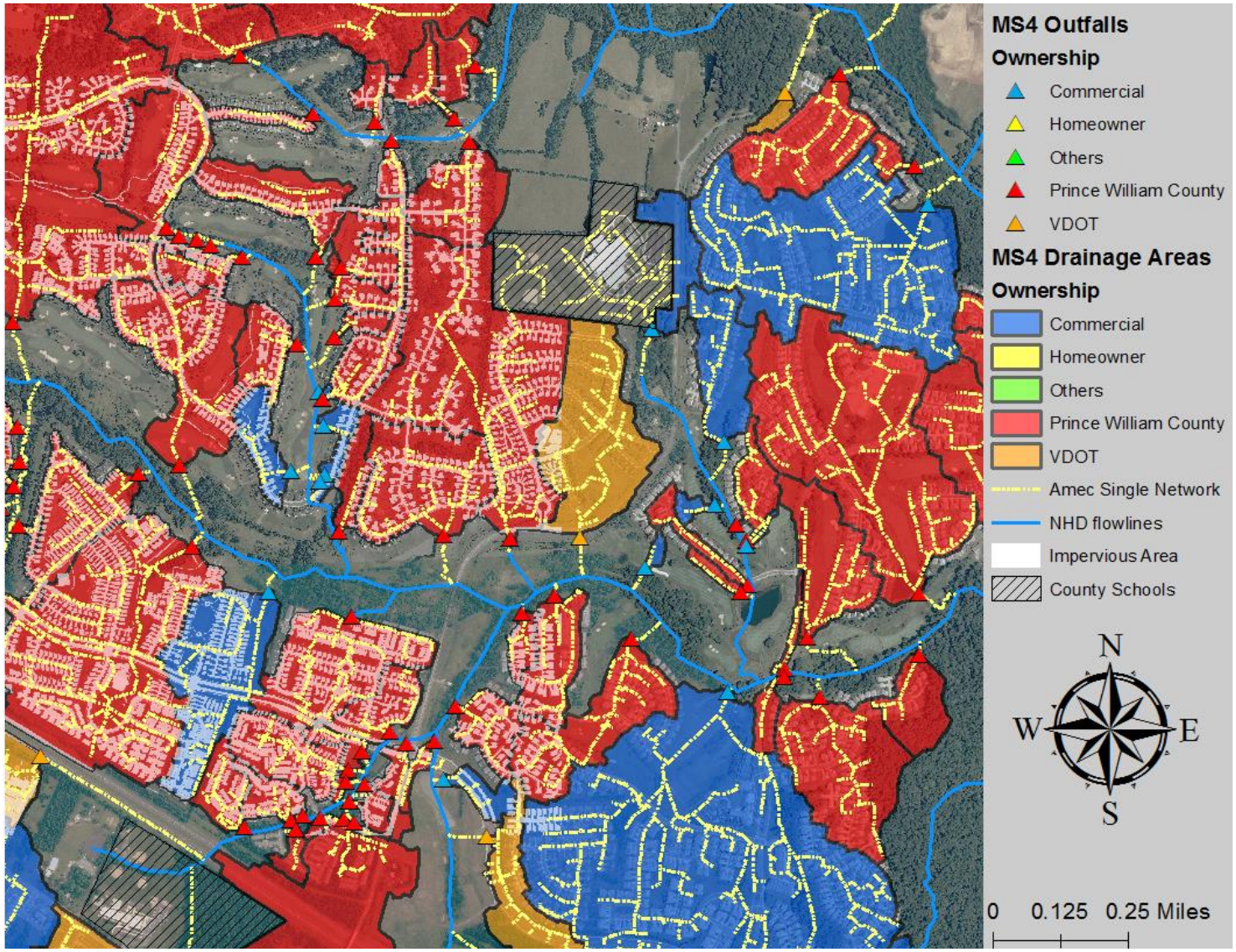


Figure 5 MS4 Outfall Drainage Area Delineation

5.3 Delineate Drainage Areas

Drainage areas for each MS4 outfall can be delineated once the DEM is hydrologically corrected and the outfall information is updated. Each outfall point location is adjusted using the Snap Pour Point tool to be coincident with the neighboring cell with the largest flow accumulation value. Snap distance is set according to DEM resolution, so outfalls can only be moved to a cell in the surrounding 3 meter x 3 meter cell window. Once the adjacent cell with the largest flow accumulation value is identified, the outfall point feature is converted to a raster and given a value based on the outfall's Individual Identification Number. The Watershed tool then calculates the upslope drainage area contributing flow to a common outlet as concentrated drainage (in the case of the Stormwater Tool, each MS4 outfall). Flow is routed from the upslope area to each outfall using the flow direction grid created in the *"1. Recondition DEM"* component. Unique raster drainage areas are then delineated for each outfall and coverted to vector polygons.

Polygon drainage areas are dissolved based on their outfall identification number (*"Outfall_ID"*), to eliminate tiny, illegitimate watersheds that are a relic of the raster-vector conversion process. The Calculate Field Management tool then calculates the total drainage area, in acres, via field geometry. Next, impervious surface data (represented by *Impervious2009*) is removed from the dissolved polygon drainage areas with the Erase tool, which produces pervious surface poylgons. Interconnected MS4s can then optionally be erased from the drainage areas, as well, if the user chooses. The interconnected MS4s are first merged and then erased from the pervious surface area. Then the pervious surface area is calculated in acres with the Calculate Field Management tool. The pervious acres field is then joined back to the dissolved drainage area polygons with the Add Join Management tool. Fields with each drainage area's local watershed and sixth order HUC are also added. Impervious surface area is then determined for each drainage area by subtracting attribute data for pervious acreage from total acreage. The resulting polygon feature class contains the impervious, pervious, and total acreage for each MS4 drainage area stored within attribute data. Additionally, the feature class contains pertinent information for *Part I.B.2.h) 4)* of the County's MS4 permit as of June 30th, 2009, displayed below.

Figure 6 Drainage Area Attribution

Reporting Requirement	Field Name in Attribute Table
Total MS4 Acres Served	"TotAcres"
Pervious MS4 Acres Served	"PervAcres"
Impervious MS4 Acres Served	"ImpAcres"
Individual Identification Number	"Outfall_ID"
Local Watershed	"WTRSHD_ID"
Sixth Order HUC	"VAHU6"
Receiving Water	"REACHCODE"
Individual Identification Number	"Outfall_ID"

5.4 Data Maintenance & Updates

Data can be updated to incorporate area added from new development within the County. The County's existing procedures for cataloging stormwater infrastructure are thorough; however, they will need to be supplemented to accommodate the Stormwater Tool. Specifically, three feature classes will require updates, which should be conducted as follows:

1. *Amec_Single_Network*[1] – New County stormsewer lines should be loaded into the Amec_Single_Network feature class in ArcCatalog. Users should then connect the new features to the existing NHD_flowlines using a DEM to determine the downslope flowpath to the stream. Additionally, there are several considersations to make when adding segments to the Amec Single Network:
    a. Avoid hydrologic loops (i.e. flow should travel downstream in a single path and avoid braiding).
    b. Do not create Amec_Single_Network segments that are closer to each other than the DEM resolution you plan to use in the Stormwater Tool. For instance if you plan to use a 10 foot resolution DEM (~3 meter), segments should be at least 10.1 feet away from one another.
    c. Check that all Amec_Single_Network segments are connected and snapped to the NHD-flowlines, otherwise they will be filled during the "1. Recondition DEM" component run. This can be verified using the Topology toolset within ArcGIS.
2. *ms4_outfalls*[2] - MS4 outfalls should be added when new manmade infrastructure is integrated into the County's stormsewer lines data. The outfalls should be placed at the end of manmade infrastructure (i.e. new stormsewer lines), but far enough away (3.5 times the DEM resolution) from the NHD_flowlines to avoid being snapped to the stream network during the processing for the "3. Delineate Drainage Areas" component. The "Ownership" and "Origin" fields need to be input as well. "Ownership" is assigned based on the "MAINT" code for each terminal segment of new infrastructure (i.e. the last stormsewer segment) and "Origin" is determined by the terminal segment's "SYM" code.

1 This is a modified County stormsewer feature class that establishes hydrologic connectivity between the County stormsewer system and the stream network. It includes both the County modified stormsewer system and user-created hydrologic connections to the stream network.

2 A feature class containing points demarcating where the municipal separate stormsewer (MS4) discharges to waters of the United States. Outfall ownership and origin (origin refers to the infrastructure or data that identified the point as an MS4 outfall, ex. rip-rap ditch) are assigned upon creation by the user according to preset domains.

3. *BMPs*[3] - BMP outfalls need to be added when new stormwater management facilities are added to the existing inventory. Outfalls should be placed at the terminus of the BMP and snapped to either Amec Single Network or the NHD flowlines.

5.5 Demonstration: Expanding the Infrastructure Network

The Stormwater Tool operates using its own geodatabase, which was based on the County's existing stormwater data, as its data source. As development occurs in the County, new stormwater infrastructure will continue to be integrated into the County's data through the existing data entry tool. **This new data still needs to be incorporated into the Stormwater Tool's geodatabase.** This section provides a step-by-step illustration of how to: 1) load new stormwater infrastructure into the Stormwater Tool's geodatabase, 2) add and assign MS4 outfalls, and 3) run the Stormwater Tool. This process will compliment the County's robust data entry tool and also allow the County to produce an updated MS4 service area throughout permit phases.

5.5.1 Loading New Infrastructure into the Stormwater Tool's Geodatabase

Amec Foster Wheeler received stormwater infrastructure data from the County in October of 2015. Existing stormsewer data from this time served as the basis for the creation of the Amec Single Network[4]. Since the County's existing stormsewer system lacked hydrologic connections to the stream network, Amec Foster Wheeler edited the stormsewer system to create hydrologic connections between the stream network and stormwater infrastructure. Additional data editing - such as eliminating hydrologic loops, clarifying flowpaths, etc. - further modified the County's existing stormsewer network. The result of these efforts was the creation of the Amec Single Network, which represents a contiguous, hydrologically connected stormsewer system.

Figure 7 New Urban Development

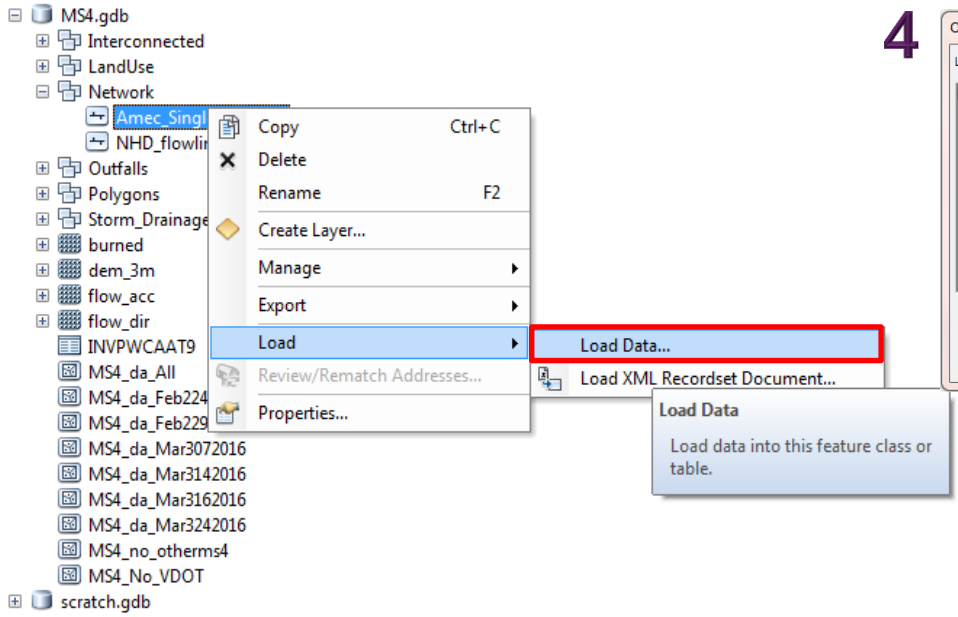
New areas of stormwater infrastructure should be added to the Amec Single Network by replicating this process. The first step in replicating this process is to load newly entered stormwater infrastructure datainto the Stormwater Tool's geodatabase. Note that this data was first entered into the County's system using the data entry tool. Figures below demonstrate how to complete the loading process in ArcCatalog.

3 A feature class containing the outfalls for the historic best management practices (BMPs) in Prince William County.

4 Modified County stormsewer feature class that establishes hydrologic connectivity between the County stormsewer system and the stream network. It includes both the County stormsewer system and hydrologic connections to the stream network, both of which were edited by Amec Foster Wheeler under direction from the County. MS4 and BMP outfalls are snapped to this feature class.

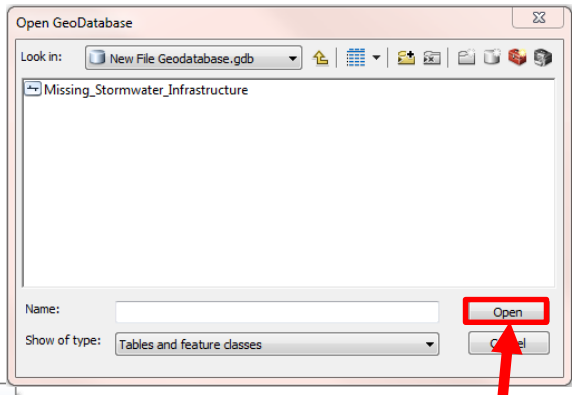
Beginning: Open ArcCatalog and navigate to MS4.gdb

1



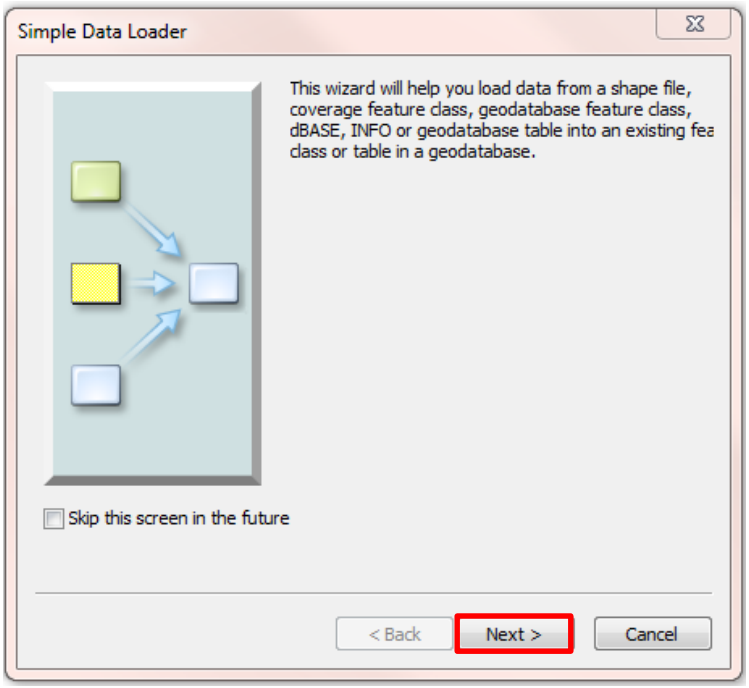
Load the new stormwater infrastructure data into the appropriate feature class in ArcCatalog. For instance for new stormsewer lines data, right click on Amec_Single_Network, then select “Load” and then follow the navigation arrow to “Load Data…”

4



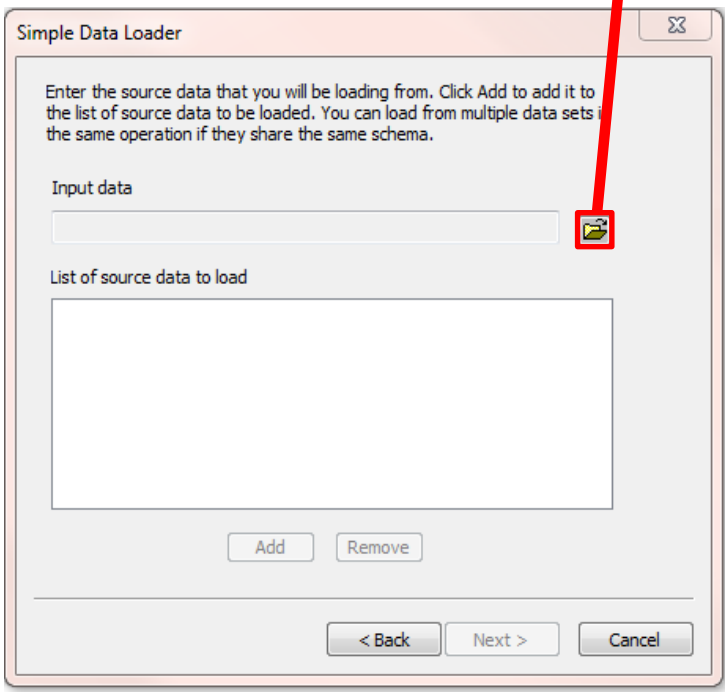
Navigate to the file pathname of the new or missing data you would like to load into the existing feature class. Select the data and then click ‘Open’.

2



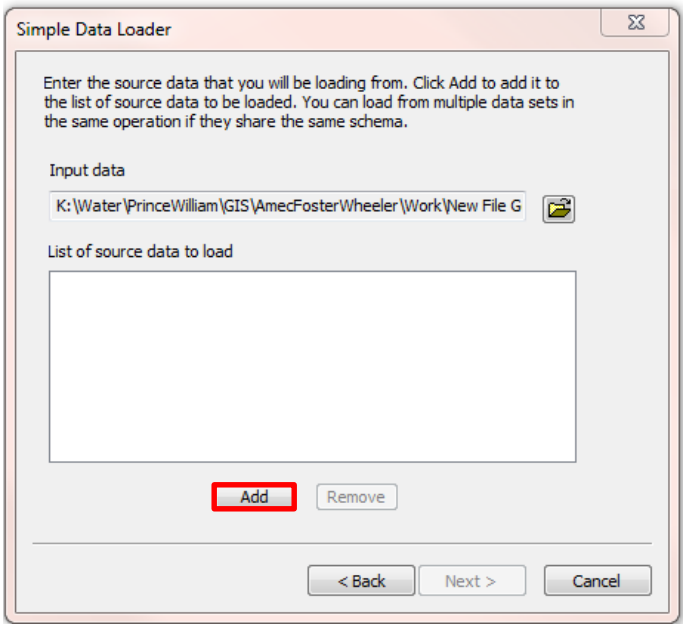
Simple Data Loader wizard opens, click ‘Next >’.

3



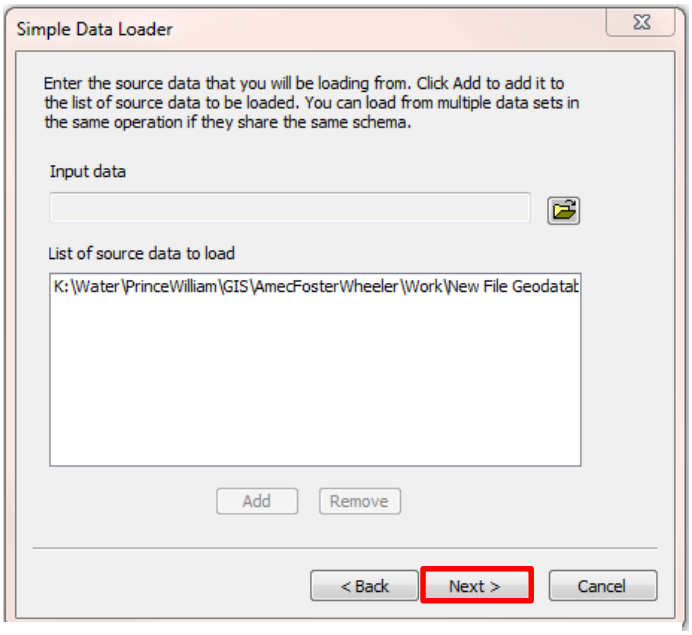
Under ‘Input Data’ click the open folder button.

5



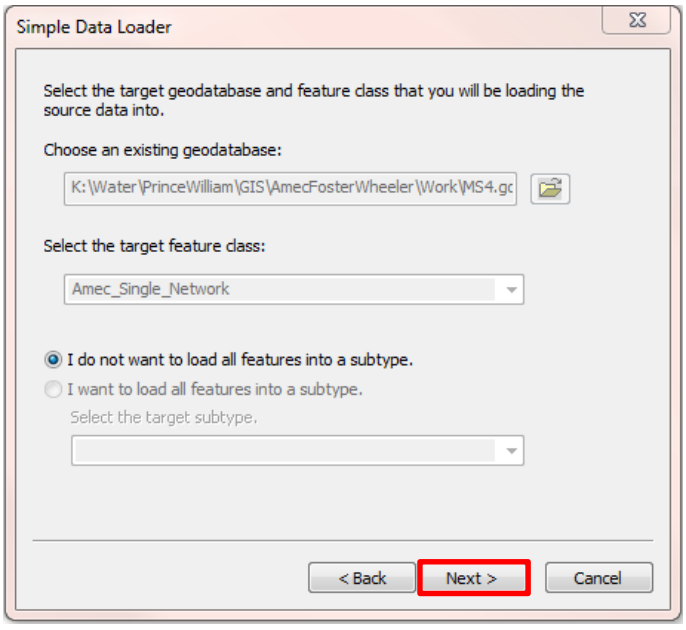
If the “Input Data” file pathname is correct, click the “Add” button.

6



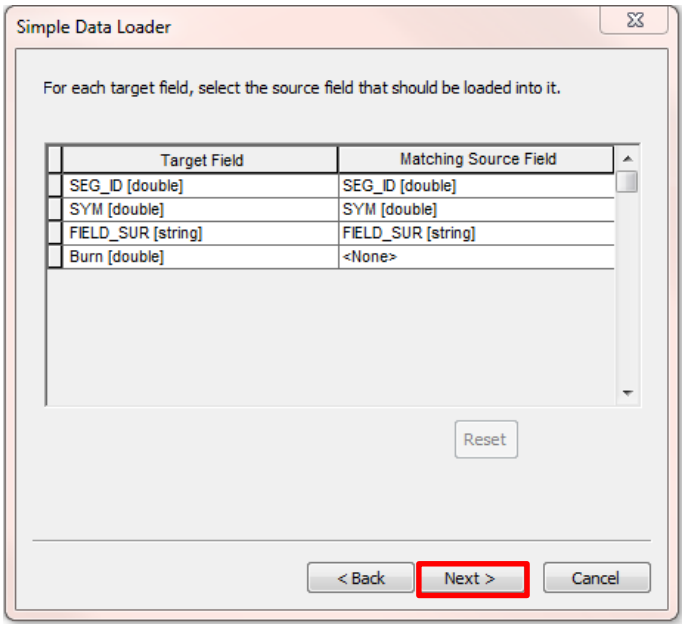
The pathname to the new or missing data should now be listed under ‘List of source data to load’. More than one data source can be loaded into an existing feature class by repeating steps 3 - 5.

7



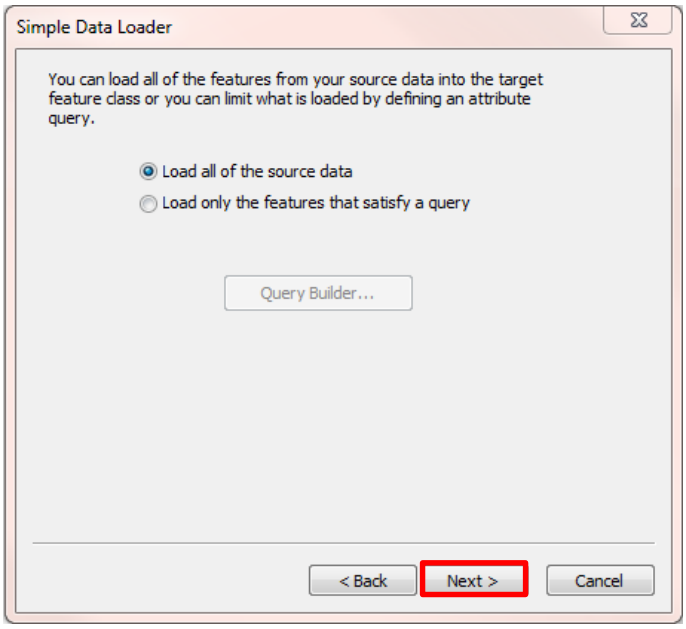
Select ‘Next’.

8



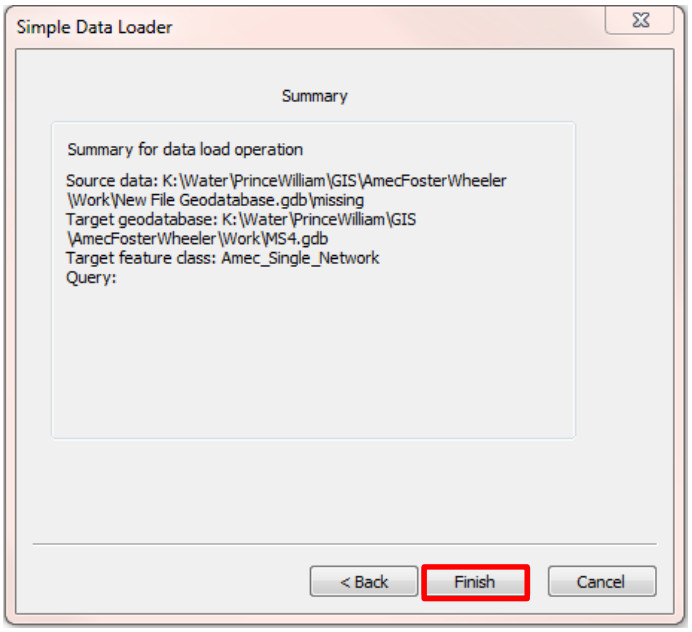
Make sure that the relevant fields from the new or missing data (‘Matching Source Field’) match the existing feature class (‘Target Field’).

9



Click the 'Load all of the source data' radio button. Then select 'Next >'.

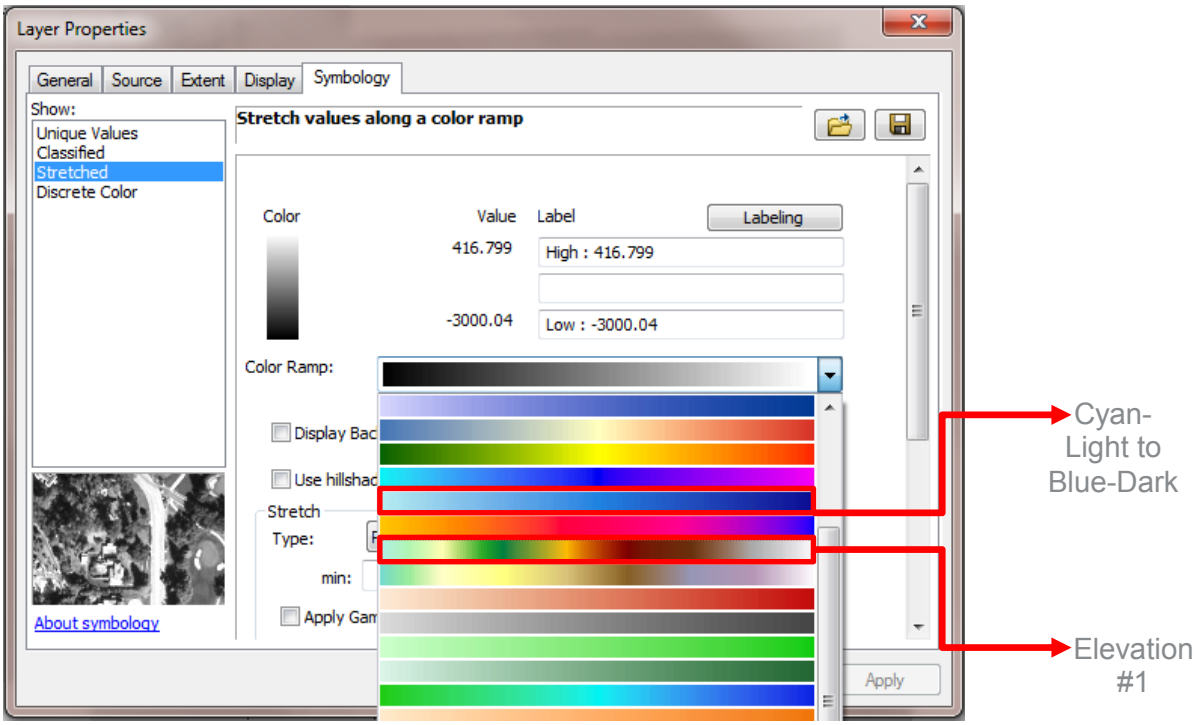
10



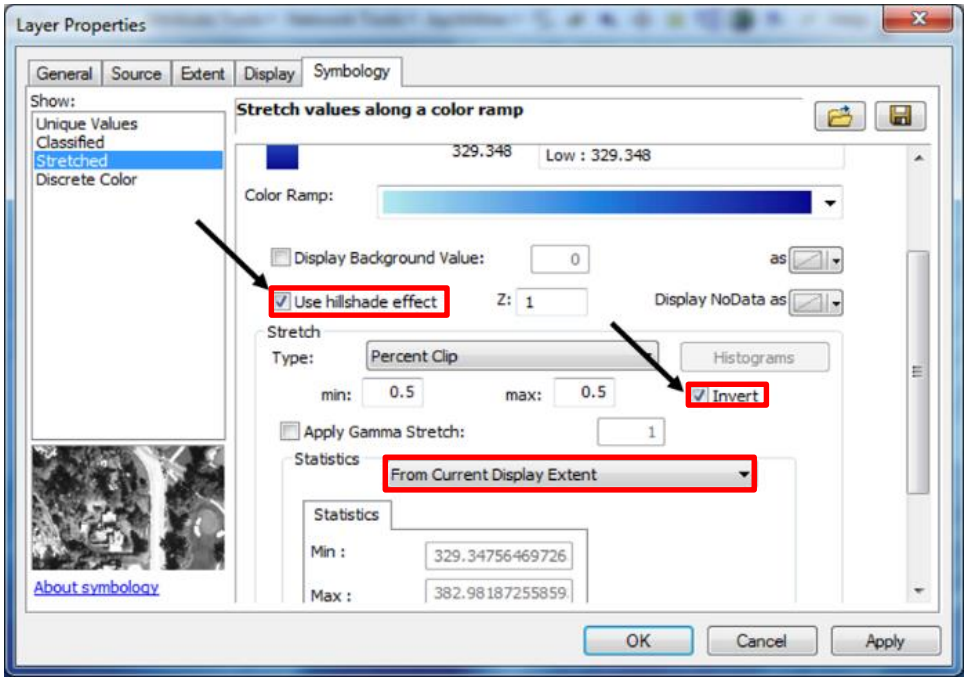
Select 'Finish'.

Figure 8. Depicts post-2009 development along Highway 15 and I-66 in Haymarket, VA. The image on the left shows the location in 2009, while the image on the right shows the area in 2015 after loading the new data into the Amec Single Network. Newly added segments still require editing to create a hydrologic connection. Editing procedures for creating this hydrologic connection are described below.

5.5.1 Recommendations for Setting DEM Symbology Prior to Editing

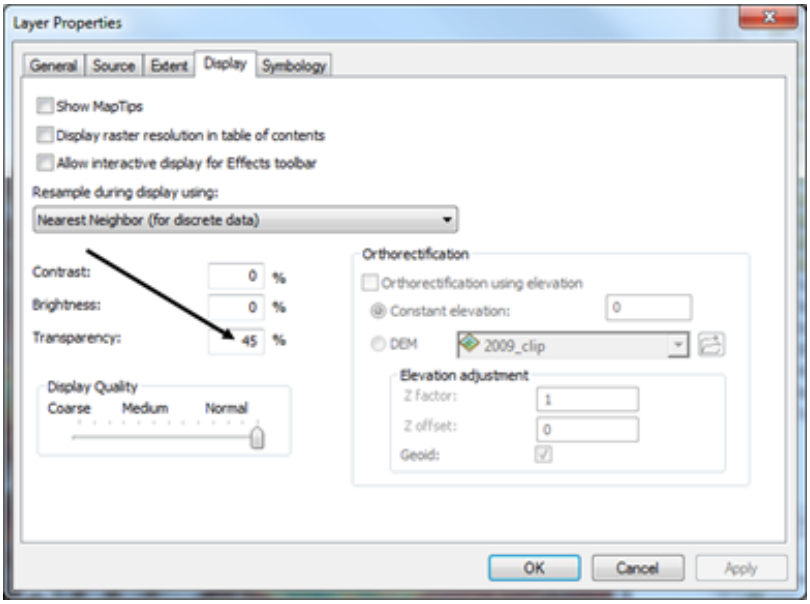


Under the Symbology tab, select the Elevation #1 color ramp. Alternatively, using the Cyan-Light to Blue-Dark color ramp is helpful when visualizing river valleys.

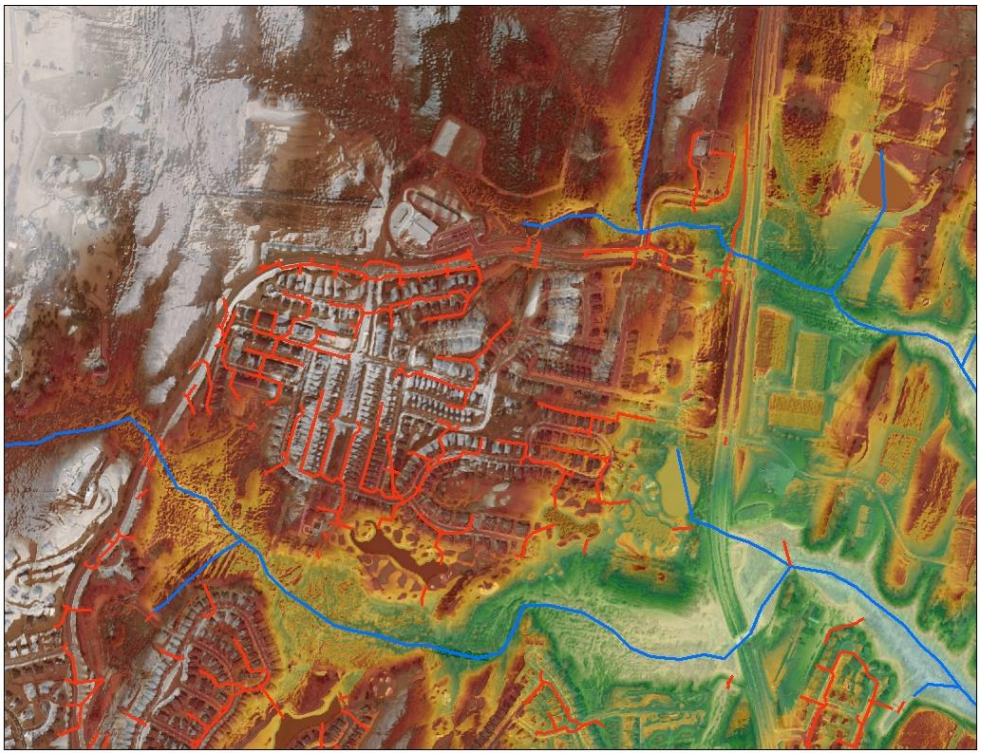


Scrolling down within the window of the Symbology tab will bring up the 'Stretch' menu. Under 'Statistics', select 'From Current Display Extent'. This will create a dynamic DEM display within

the map document, allowing for easier visualization of local flow patterns. Additionally, select the check boxes for “Use hillshade effect”. If using the blue color ramp, select “Invert”.



Adjusting the transparency of the DEM makes the layer a useful overlay to get a sense of the topography in relation to what’s displayed in the aerial imagery. Within the Display tab, set the Transparency level to a value that allows for the aerial imagery to be clearly visible through the DEM surface (45% is recommended, see above). The resulting DEM symbology should be similar to what is shown below.



5.5.2 Assign Jurisdictional Outfalls

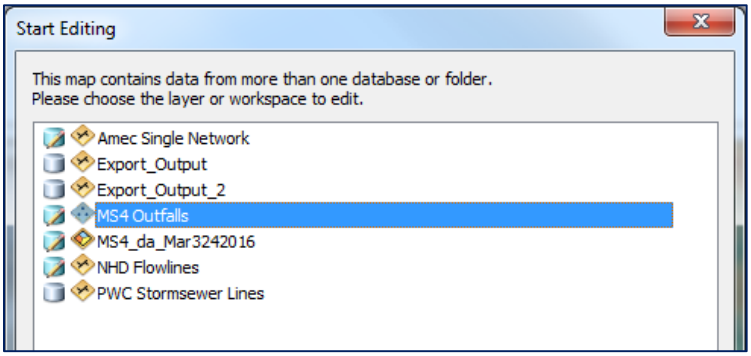
Figure 9. This view shows what the user would see after loading in a new set of stormwater infrastructure into the geodatabase. MS4 outfalls and hydrologic connections still need to be added by the user. Note the stormwater infrastructure is a disconinuous network within itself, but also lacks continuity with the NHD Flowlines.

The first step in preparing the newly loaded infrastructure for analysis within the Stormwater Tool is identifying jurisdictional outfalls and assigning proper ownership. The following examples illustrate two common situations a user may encounter where a jurisdictional outfall must be assigned: BMPs (Figure 10) and grass swales or ditches extending from subsurface pipes (Figure 11). Before we add outfalls, we must begin an editing session that will allow us to add to the infrastructure network.

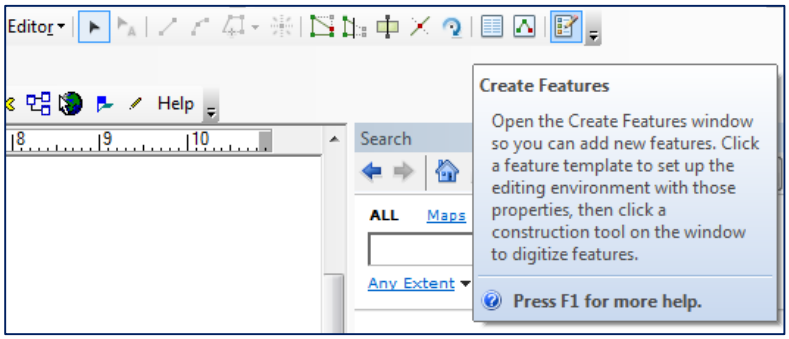
Starting an editing session

From the top ribbon within ArcMap, select Customize → Toolbars → Editor. The Editor Toolbar will appear. Click on the Editor drop down menu and select “Start Editing”.

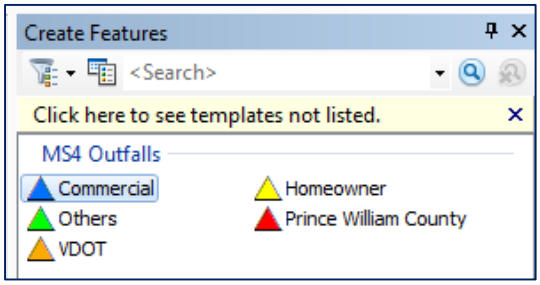
Within the Start Editing window, select the layer you will be editing. For the next session, you will be adding outfalls, so select MS4 Outfalls (or the name of the layer as it appears in the ArcMap window). You will be adding new outfalls to the layer of outfalls that have been already mapped by Amec Foster Wheeler.



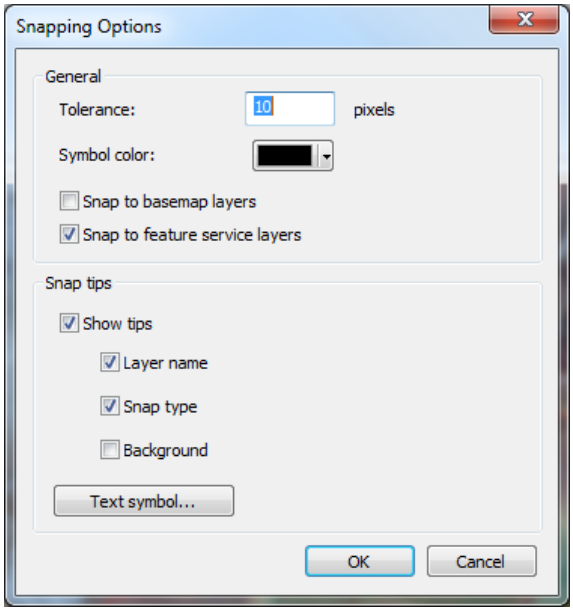
Returning to the Editor drop down menu, select Editing Windows → Create Features. The Create Features window can also be accessed from the Editor Toolbar.



Within the Create Features window, you can select which type of outfall you would like to add, by Ownership. This is explained in greter detailed previously in this document. The first outfall we will be assigning is for a commercial BMP, so select “Commercial”.



It is important to check that the points are snapping to stormwater infrastructure segments. You can access Snapping Options from the Editor drop down menu (Editor → Snapping → Snapping Options). Verify that “Snap to feature service layers” is selected.



You can now assign the commercial outfall for the BMP of interest.

Outfall Addition Example 1: BMPs

Consider the position of the BMP within the stormwater drainage network. There are two stormwater pipes draining to the pond, with flow direction heading south. This infrastructure will be connected at a later step, but for now we are concerned with assigning the outfall at the terminus of this system. Examining the NHD confirms that flow is draining south of the BMP, and an outfall is added (Figure 9).

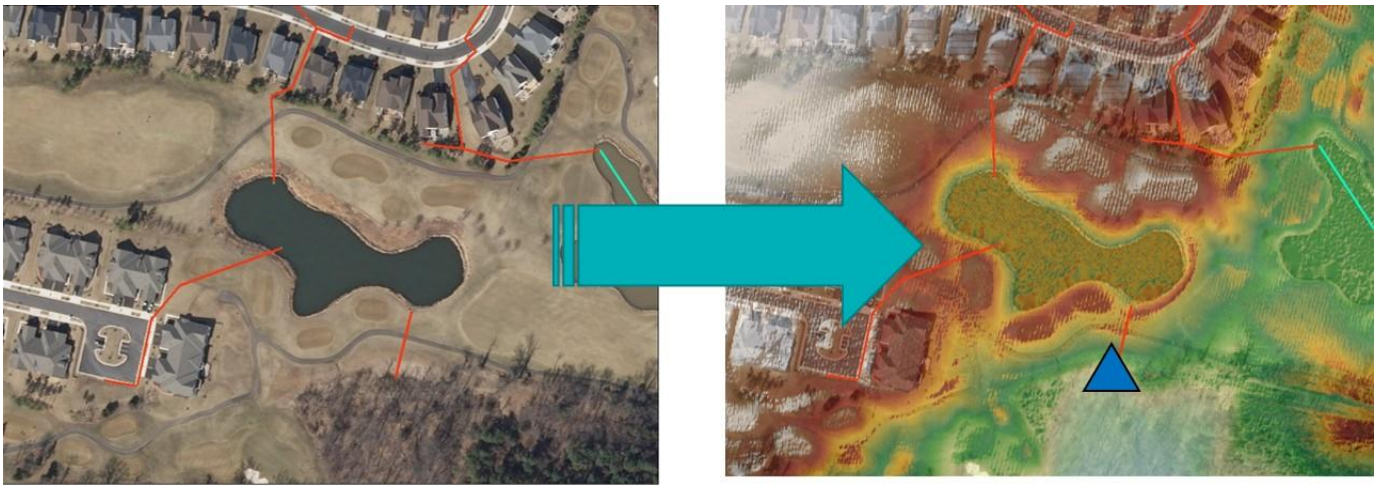


Figure 10. BMP outfall assignment. Note that the two upstream segments are not assigned outfalls, as they do not lie at the terminus of the stormsewer system.

Outfall Addition Example 2: Ditches

While the rationale behind this assignment is straightforward (the outfall is placed at the end of the line segment), it is important to note that line segments within the Stormsewer Lines or Amec

Single Network layers are not all representative of 'solid' infrastructure, such as pipes, grates, and culverts, but can represent the drainage ditches that were excavated out of the sides of hillslopes for facilitiating storm drainage to river valleys. Further aerial imagery analysis can assist in clarifying any uncertain areas.

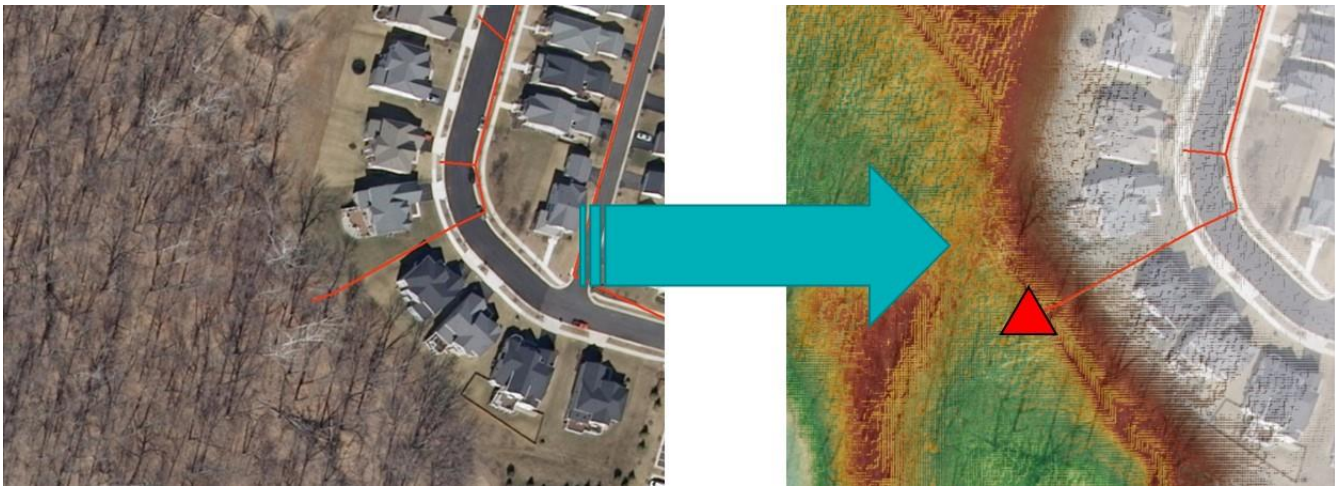


Figure 11 Rip rap ditch outfall assignment. Note that the outfall has been placed at the end of the line segment. Outfall location can be verified using other aerial imagery services, such as Bing or Google Maps.

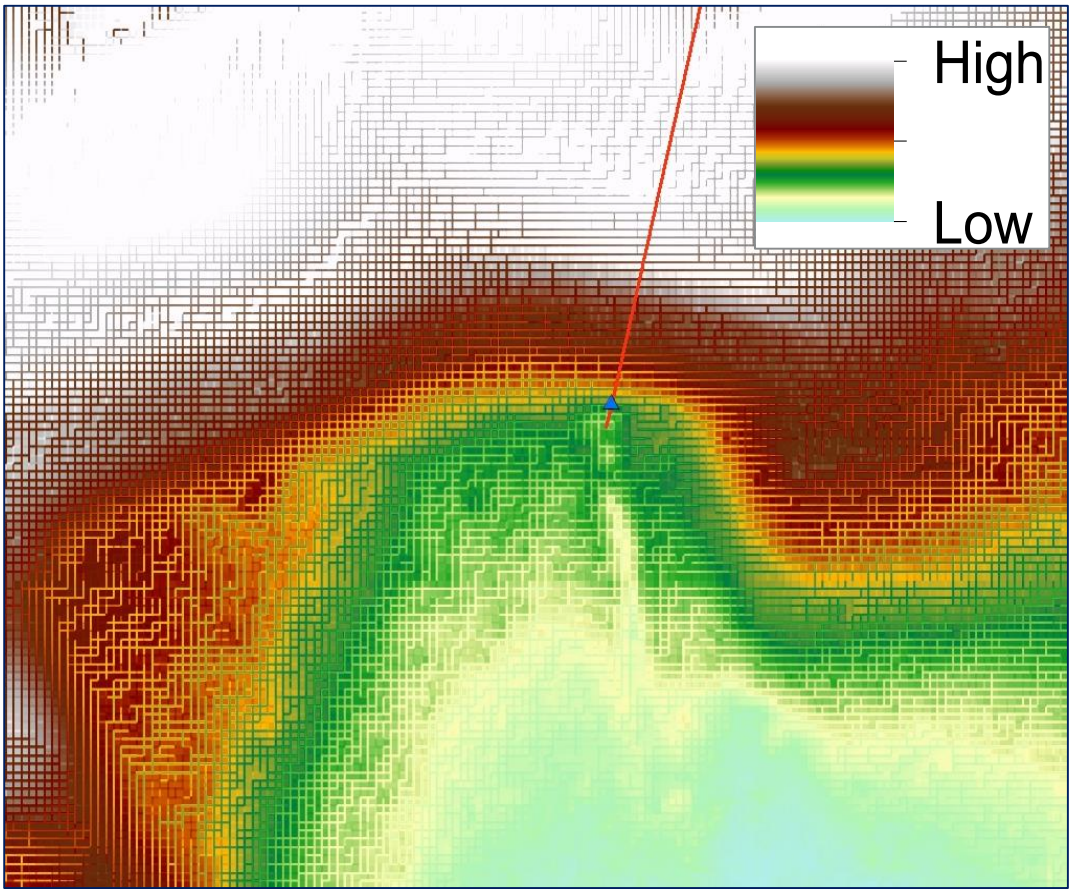


Figure 12 Enhanced view of Figure 10. It is critical to understand the rationale behind outfall placement.

Figure 12 illustrates an important point in placing outfalls. The user must not place an outfall where it will capture upstream flow that does not originate from the MS4 (i.e. river valleys). Figure 12 is an enlarged image from Example 1 from this exercise: at the terminal point of the commercial BMP drainage system. Careful outfall placement will provide the most precise results.

5.5.3 Add Hydrologic Connection

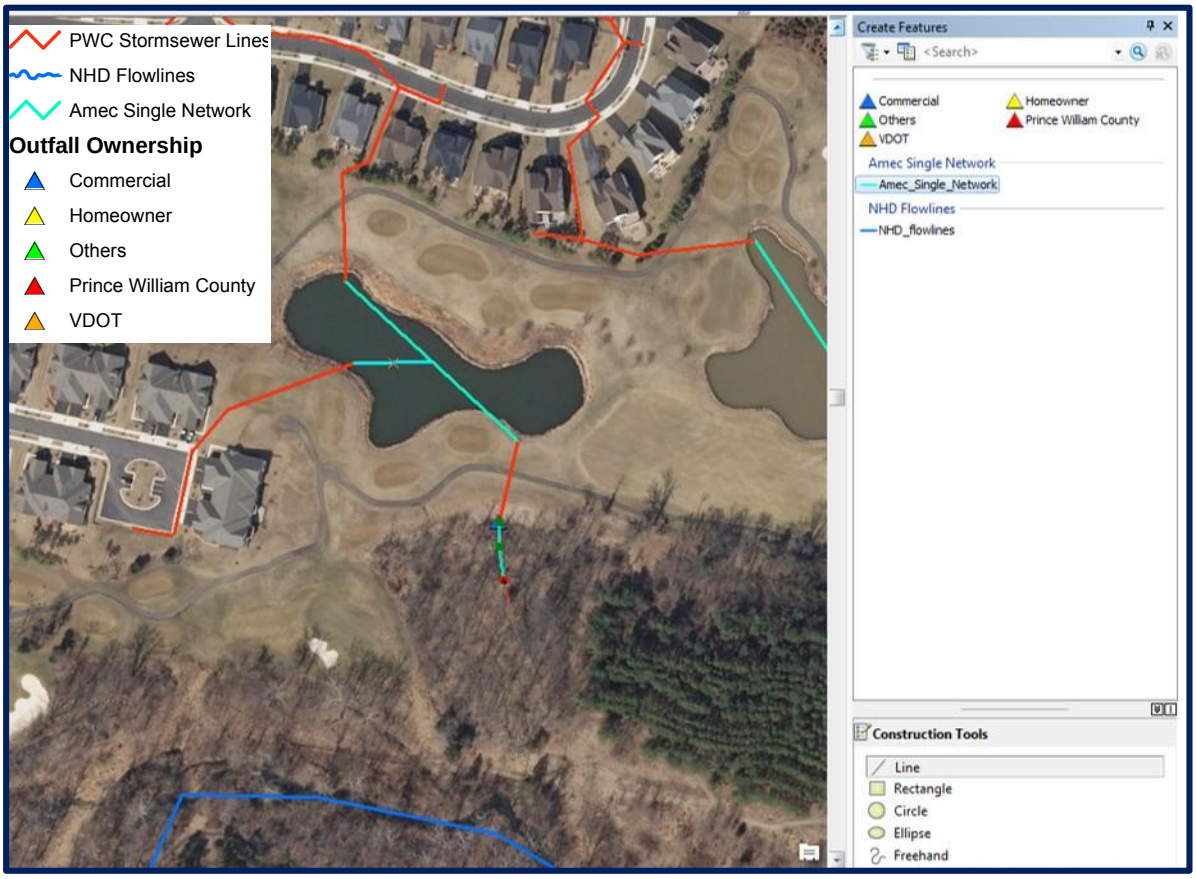


Figure 13 Opening the Create Features Toolbar will allow the user to draw segments connecting the infrastcture to NHD flowlines.

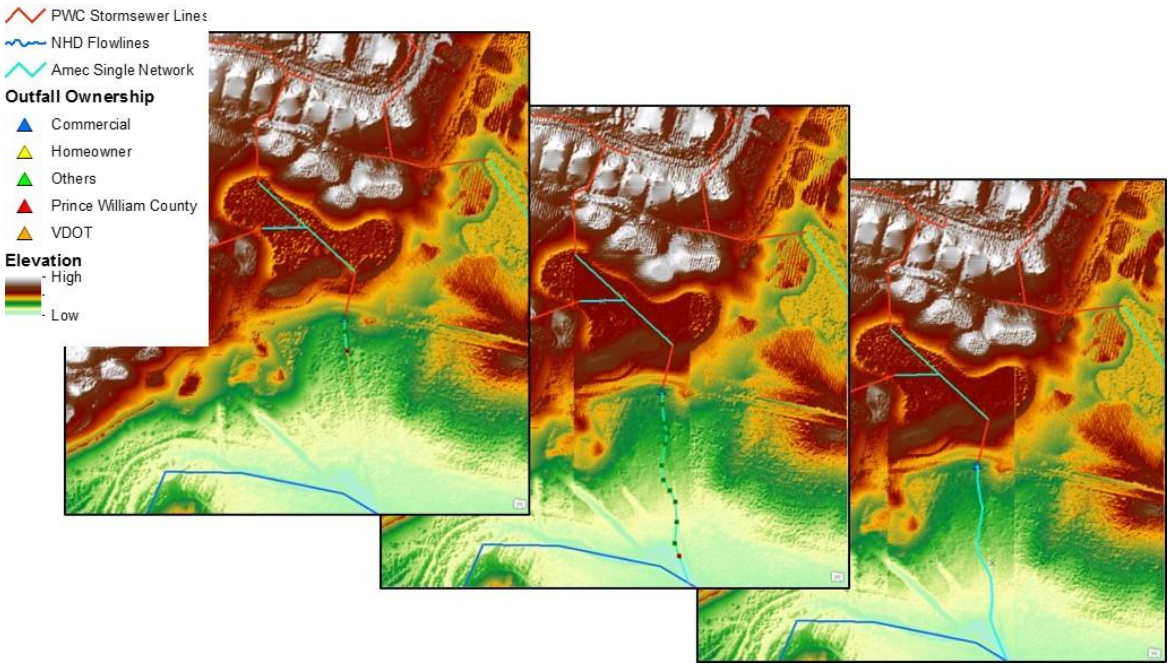


Figure 14 Addition of hydrologic connection segment originating from a BMP.

Maintaining a contiguous network of stormwater flow patters is necessary for reconditioning the DEM in a later processing step. These concepts are further explained in Sections 5.1 and 5.3. Check that the Spatial Analyst extension for your ArcMap license is enabled (Customize → Extensions → Spatial Analyst) and the Editor Toolbar is open (Customize → Toolbars → Editor). Start editing Amec_Single_Network by adding new segments connecting stormwater infrastructure to the NHD Flowlines. Use the 1 meter DEM as a reference to check that the new network is reflecting local hydrologic flow patterns. Results can be seen in Figures 14 and 15.

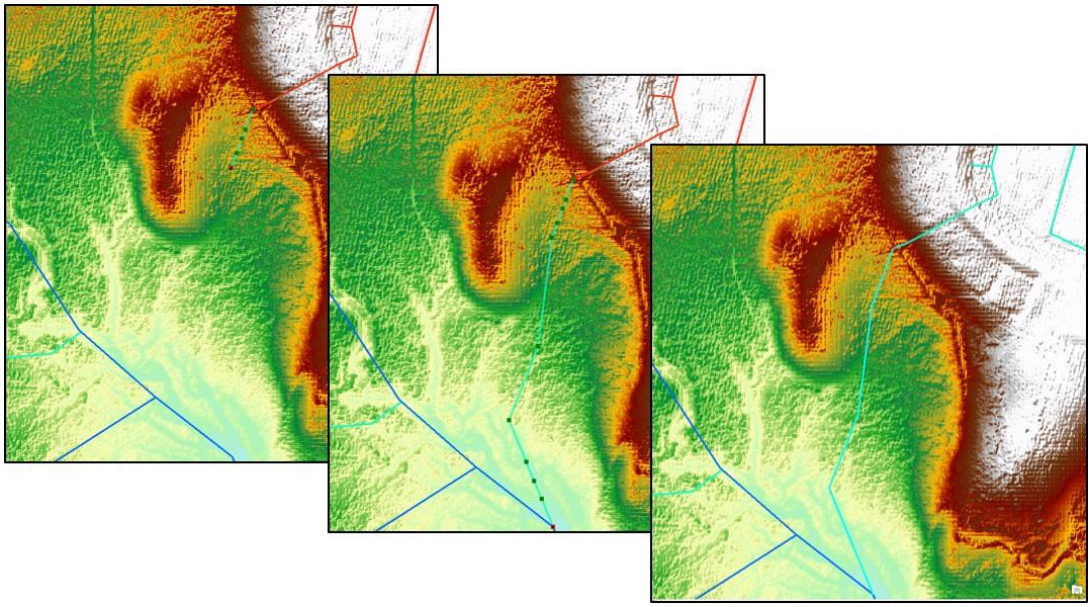


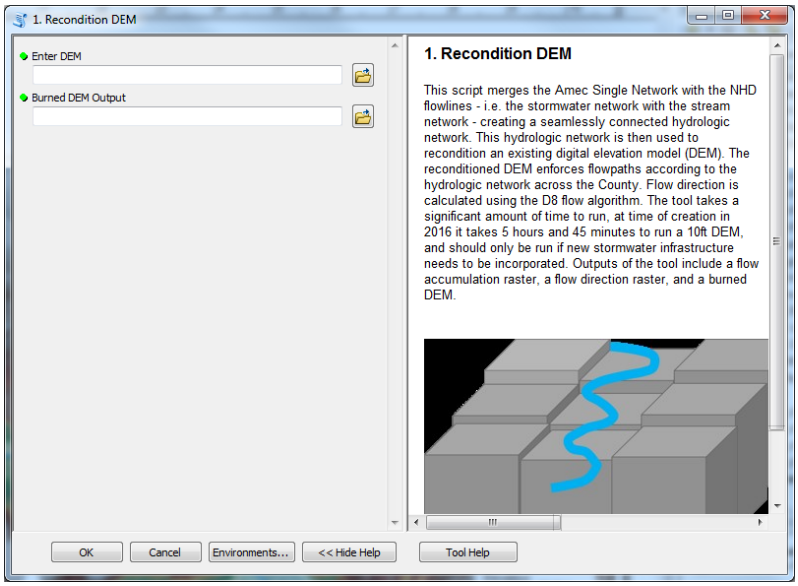
Figure 15 Addition of hydrologic connection segment originating from a drainage ditch.

5.6 Demonstration: Running the Stormwater Tool

Open a new map document without loading in any layers. Any layers that are in use during the time of the Stormwater Tool run will create a schema lock and prevent it from functioning. Navigate to “Stormwater Tool.tbx” within the catalog, and open up the first component script, “1. Recondition DEM”.

5.6.1 Recondition DEM

This component merges the stormwater network with the NHD flowlines, creating a contiguous network in order to accurately capture localized flow patterns in the reconditioned DEM. This allows for the Stormwater Tool to effectively model stormwater flow at a county-wide scale using simple surface flow hydrology principles.



Enter DEM: Specifies the DEM to be reconditioned. Any DEM can be used; however, the resolution should be at least 10 feet (or 3 meters). Increases in resolution will result in longer processing time. A suitable 3 meter DEM of the County is included in the MS4.gdb.

Burned DEM Output: Specifies the output location for the reconditioned DEM. Select “scratch.gdb” and name the output “burned”. Alternatively, it can be stored wherever the user desires.After the desired input and output locations are specified, click ‘OK’ to begin processing. The reconditioned DEM should display a network of cells that overlaps with the NHD and

Stormwater Network polylines. Overlaying the 'burned' DEM with the demonstaration area will show a similar visual as seen below:

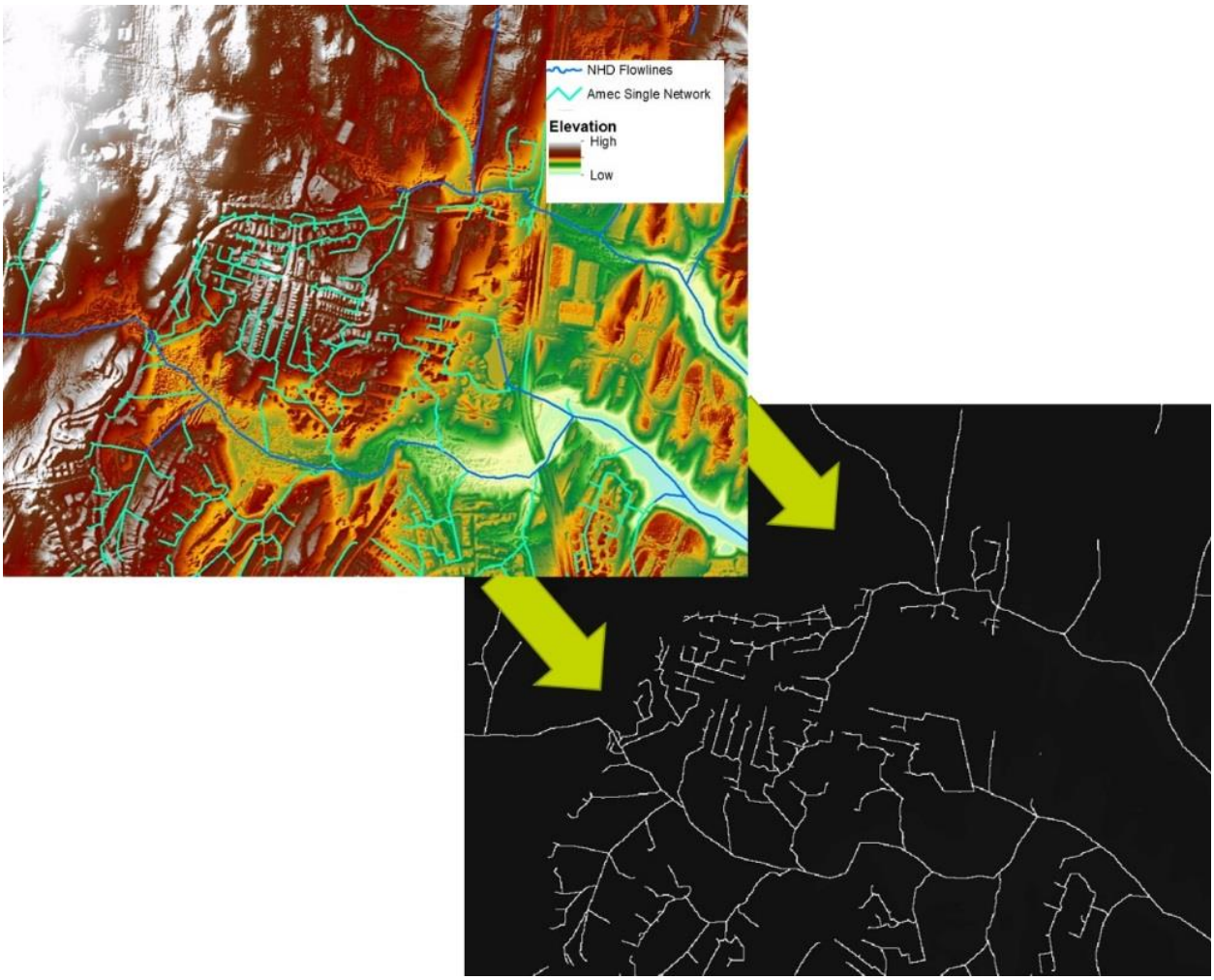
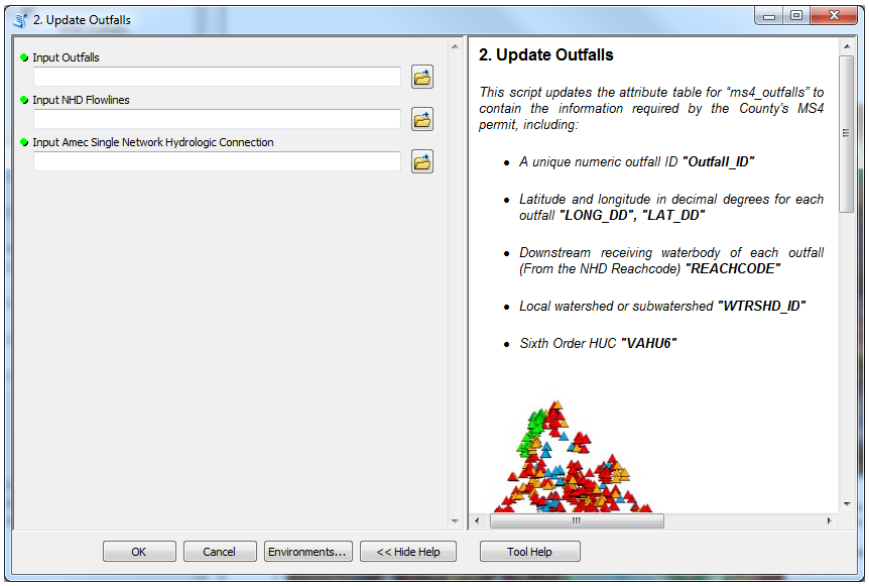


Figure 16 The DEM displays the merged stormwater infrastructure and hydrologic connection networks and NHD Flowlines (collectively known as the Amec Single Network) that were burned into the DEM raster surface. The stark contrast in elevation shows the 'canyons' created by the DEM reconditioning. Using this reconditioned DEM ensures the calculated flow accumulation captures accurate storm flow overland into stormwater conveyances.

5.6.2 Update Outfalls



This component does not produce any new layers that can be observed. Outfall attribute data are being updated to serve in the County's record keeping as required by *Part I.B.2.h) 4)* of their VSMP Permit.

This component uses "joins" to update the attribute table for "ms4_outfalls" so that the Stormwater Tool outputs contain information required by the County's MS4 permit.

- It assigns a unique outfall ID to each point for use in later tool functions
- It finds the points of intersection between the County's stormwater network and NHD flowlines to identify receiving waterbodies for each outfall, performs a watershed delineation to these points, and then spatially joins the Reach Code for each relevant branch with its outfall.
- It identifies the lat/long for each outfall
- It identifies the HUC12 and Local Watershed (fifth and sixth order) that each outfall discharges stormwater

Input Outfalls: Input the outfall point feature class to assign information. To input the County's MS4 outfalls, navigate to the "Outfalls" feature dataset in the MS4.gdb and select "ms4_outfalls"

Input NHD Flowlines: Specifies the NHD flowlines used to assign receiving waterbody information. Navigate to the "Network" feature dataset and select "NHD_flowlines".

Input Amec Single Network Hydrologic Connection: Specifies the stormwater network to be used. Navigate to the "Network" feature dataset and select "Amec_Single_Network".

The following information has been added to the attribute data for "ms4_outfalls": receiving waterbody, local watershed (Virginia Sixth Order), HUC12, and latitude/longitude coordinates. You can verifiy this by opening the attribute table (Figure 17).

Table

OBJECTID *	SHAPE *	Ownership	Origin	Outfall_ID	REACHCODE	VAHU5	VAHU6	HUC_12
1	Point	Prince William County	BMP	1	02070010003058	PL-O	PL41	020700100801
2	Point	Commercial	RRD	2	02070010001992	PL-N	PL42	020700100701
3	Point	Prince William County	GD	3	02070010001981	PL-N	PL42	020700100701
4	Point	Prince William County	GD	4	02070010001977	PL-N	PL42	020700100701
5	Point	Prince William County	GD	5	02070010002023	PL-N	PL42	020700100701
6	Point	Prince William County	GD	6	02070010000835	PL-N	PL42	020700100701
7	Point	Commercial	BMP	7	02070010000835	PL-N	PL42	020700100701
8	Point	Others	STP	8	02070010000849	PL-N	PL42	020700100701
9	Point	VDOT	STP	9	02070010002060	PL-N	PL42	020700100701
10	Point	Commercial	BMP	10	02070010000848	PL-N	PL42	020700100701
11	Point	Commercial	BMP	11	02070010000848	PL-N	PL42	020700100701

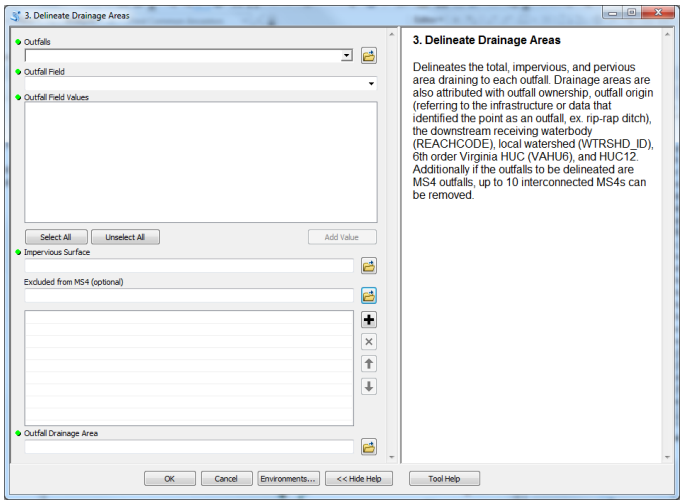
1 (0 out of 4841 Selected)

Amec Single Network | PWC Stormsewer Lines

Figure 17 Attribute table for resulting updated outfall information.

5.6.3 Delineate Drainage Areas

This component delineates the drainage area to each outfall, and then assigns the relevant data mentioned in 'Update Outfalls' tool from the corresponding outfalls.



- After performing the watershed delineation for each outfall in ms4_outfalls, it converts the resulting rasters to polygons
- It calculates the total pervious area contributing runoff within each drainage area by erasing the impervious area from the total drainage area
- It calculates the total impervious area contributing runoff by subtracting the pervious area from the total area for each drainage area polygon
- It spatially joins the attribute information from "ms4_outfalls" to the drainage area polygons by identifying each polygons' corresponding outfall that lies "within" the polygon.

Note that use of this component will cause the Frequency tool to concurrently run as the user makes a selection of Field categories to select outfall ownership types. This is due to validation Python code that interacts with ArcMap and updates field values to be selectable for the user.

Input Outfall Points: Requires the drainage delineation point input file. Attribute information for *"ms4_outfalls"* has now been updated. Navigate to the "Outfalls" feature dataset and select it.

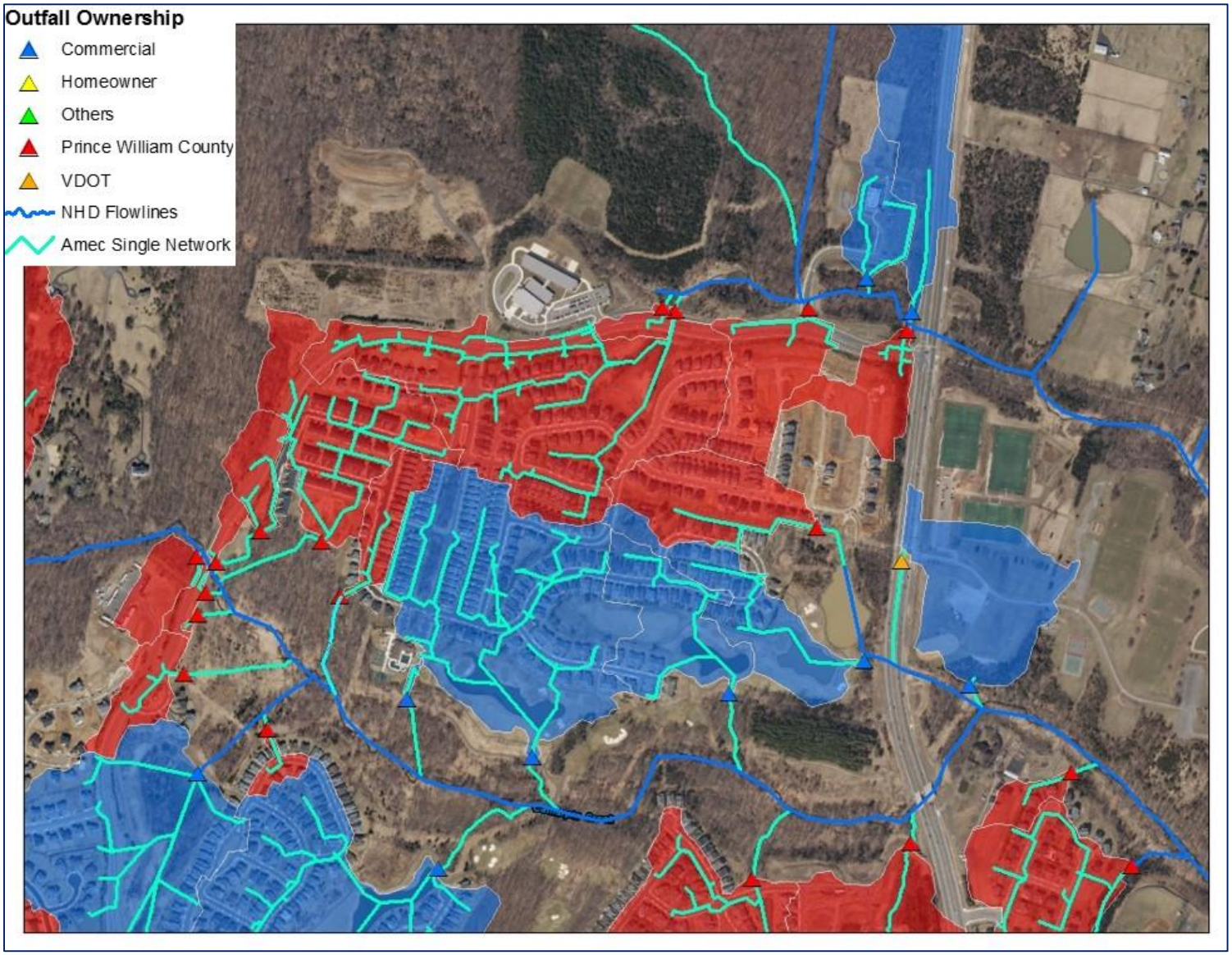
Outfall Field: Specifies the field from the attribute table that the MS4 drainage area selection will use. Choose *"Ownership"* from the drop-down menu.

Outfall Field Values: Allows the user to select which values to select from the specified field in the "ms4_outfalls" attribute table. The subarea for this exercise only contains outfalls owned and maintained by the County and Other entities. Select "County" and "Other".

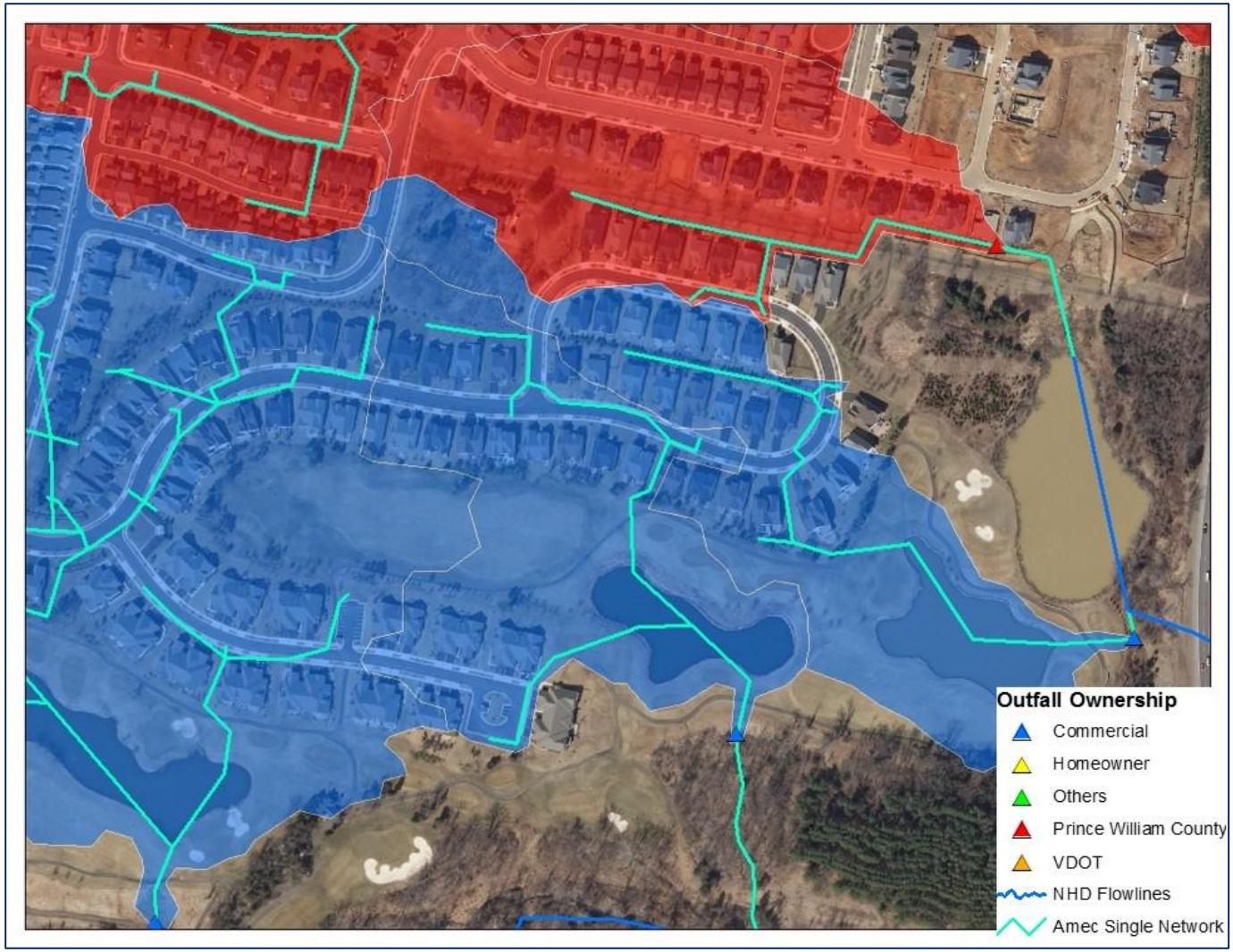
Impervious Surface: Lets the user specify which impervious surface data to use to determine the impervious area for each drainage area. This allows the County to update their drainage areas with each permit cycle (impervious data from 2009 will be used in phase 1 of the cycle).

Excluded from MS4: Permits the user to remove areas that should be excluded from the MS4 drainage area calculations. This includes interconnected MS4s (e.g. VDOT) and areas specifically excluded from regulated urban impervious and pervious cover, such as forested lands. These are all contained in the feature dataset "Interconnected".

Outfall Drainage Area: Specifies the file name and location for the output of the component. Once a filename is specified, the 'Delineate Drainage Areas' tool may be run.


Outfall Ownership
Commercial
Homeowner
Others
Prince William County
VDOT
NHD Flowlines
Amec Single Network

Focusing in on a familiar area can reveal more about the particular details of the contributing stormsewer system. Notice that the area drained by the Amec Single Network and the NHD flowlines are flowing to the outfalls, which serve as accumulation nodes for those upstream networks of pipes, streams, and BMPs.



Finally, users attempting to determine the MS4 service area should remove all excluded lands contained in the 'Interconnected' feature dataset. This can be achieved in the *'Delineate Drainage Areas'* component in the *'Excluded from MS4'* parameter. The result of removing these areas from the MS4 service area (undeveloped forested land, interconnected MS4s, and VPDES permitted entities) is depicted below.

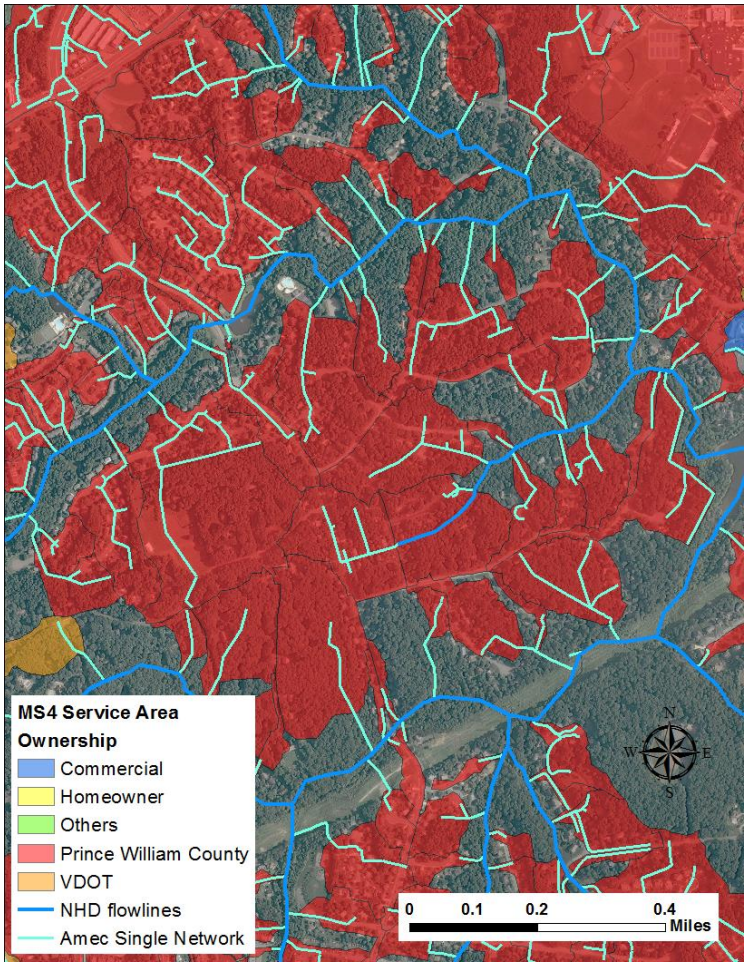


Figure 18 MS4 Service Area Before Removing Excluded Areas

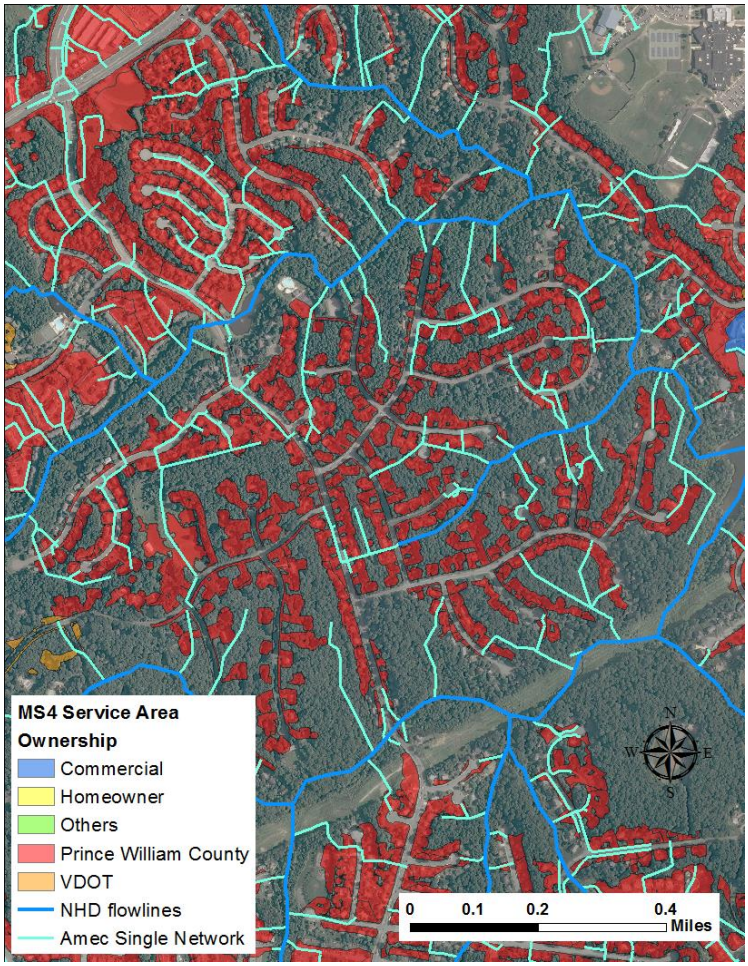


Figure 19 MS4 Service Area After Removing Excluded Areas

6 Appendix A: Source Code

```
# ---------------------------------------------------------------------------------------------------------------------
# Name:                 Recondition_DEM.py
# Purpose:              This tool reconditions a digital elevation model (DEM) to include new
                        segments of the stormwater network.
# Author:               John P. Miller
# Copyright:(c)         Amec Foster Wheeler | Prince William County, Virginia
# ArcGIS Version:       10.2
# Python Version:       2.7.3
# ---------------------------------------------------------------------------------------------------------------------

# Import the Modules
import arcpy, sys, os
from arcpy import env
from arcpy.sa import *

# Checkout Spatial License (Required!)
arcpy.CheckOutExtension("spatial")

# Overwrite Existing Files!
arcpy.env.overwriteOutput = True

# Get Relative Paths
rootWS = os.path.dirname(sys.path[0])
MS4 = os.path.join(rootWS,'MS4.gdb')

# Set Env Variables
arcpy.env.workspace = MS4
arcpy.env.scratchWorkspace = rootWS

# Prompt User for DEM Pathname
DEM = arcpy.GetParameterAsText(0)
if (not DEM):
    arcpy.AddMessage("Select your DEM")
    DEM = raw_input("Enter the DEM File Pathway")

# Project DEM to "NAD_1983_StatePlane_Virginia_North_FIPS_4501_Feet"
DEM_proj = os.path.join(arcpy.env.scratchGDB,"DEM_proj")
spatialRef =
"PROJCS['NAD_1983_StatePlane_Virginia_North_FIPS_4501_Feet',GEOGCS['GCS_North_America
n_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.257222101]],PRI
MEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['Lambert_Conformal_Co
nic'],PARAMETER['False_Easting',11482916.66666666],PARAMETER['False_Northing',6561666.666
666666],PARAMETER['Central_Meridian',-
78.5],PARAMETER['Standard_Parallel_1',38.03333333333333],PARAMETER['Standard_Parallel_2',
```

```
39.2],PARAMETER['Latitude_Of_Origin',37.66666666666666],UNIT['Foot_US',0.3048006096012192]
]"
arcpy.ProjectRaster_management(DEM, DEM_proj, spatialRef, "BILINEAR")

# Set Raster Environment Settings
arcpy.env.snapRaster = DEM_proj
arcpy.env.cellSize = DEM_proj
arcpy.env.mask = DEM_proj

# Local Variables:
Network = os.path.join(MS4,'Network')
NHD_flowlines = os.path.join(Network,"NHD_flowlines")
Amec_Single_Network = os.path.join(Network,"Amec_Single_Network")
merged_network = os.path.join(arcpy.env.scratchGDB, "merged_network")
merged_stormwater_raster = os.path.join(arcpy.env.scratchGDB, "merge_storm")
assignmentType = "Maximum_Combined_Length"
priorityField = "Shape_Length"
DEM_resolution = arcpy.Describe(DEM_proj).meanCellHeight

# Geoprocessing
# Add "Burn" Field and Calculate Burn Depth for Amec_Single_Network
arcpy.AddField_management(Amec_Single_Network, 'Burn', 'Double')    # Add 'Burn' field to
Amec_Single_Network
arcpy.CalculateField_management(Amec_Single_Network, "Burn", -2000) # Calculate 'Burn' value of
-2000 feet for stormsewer infrastructure and hydrologic connections

# Add "Burn" Field and Calculate Burn Depth for NHD_flowlines
arcpy.AddField_management(NHD_flowlines, 'Burn', 'Double')        # Add 'Burn' field to
NHD_flowlines
arcpy.CalculateField_management(NHD_flowlines, "Burn", -3000) # Calculate 'Burn' value of -2000
feet for streams

# Merge Amec_Single_Network with the Modified NHD_flowlines
arcpy.Merge_management([Amec_Single_Network, NHD_flowlines], merged_network)

# Convert Merged Network to Raster with Burn Depth as the Value and the Cellsize Based on the
DEM
arcpy.PolylineToRaster_conversion(merged_network, "Burn", merged_stormwater_raster,
assignmentType, priorityField, DEM_resolution)

# Reclassify NoData Cells to Zero
reclass_dem = Reclassify(merged_stormwater_raster, "Value",
                                                    RemapValue([[-3000,-3000],[-2000,-
2000],["NODATA", 0]])) # NHD Flowlines at -3000, Amec_Single_Network at -2000 and Everything
Else (land cells) at 0
reclass_dem.save(os.path.join(arcpy.env.scratchGDB,"reclass_dem"))
          # Save reclassified DEM as "reclass_dem" in scratchGDB
```

```
# Burn the Streams into the Original DEM by Dropping the Stream and Stormsewer Network
Burned_DEM = arcpy.GetParameterAsText(1)                                    # Set the
hydrologically reconditioned DEM as the second parameter
if (not Burned_DEM):                                                        # If
statement to prompt for file pathway to save the hydrologically reconditioned DEM
   arcpy.AddMessage("Enter Output Location for Burned DEM") # Python message to appear when
running as standalone script
   Burned_DEM = raw_input("Enter Burned DEM Ouput")          # Prompts second parameter
outPlus = Plus(DEM_proj, reclass_dem)                                       # Use raster math
to add the burned DEM with the original DEM. Results in a hydrologically reconditioned DEM
outPlus.save(Burned_DEM)                                                    # Save the
hydrologically reconditioned DEM

# Fill DEM
Fill_DEM = Fill(outPlus)                                                    # Fill pits
and depressions
Fill_DEM.save(os.path.join(arcpy.env.scratchGDB,"fill"))    # Save filled DEM as "fill" in scratchGDB

# Flow Direction
Flow_Dir = FlowDirection(Fill_DEM,"NORMAL") # Calculate the flow direction of each cell using the
D8 algorithm from O'Callaghan & Mark, 1984
Flow_Dir.save(os.path.join(MS4,"flow_dir")) # Save flow direction as "flow_dir" in MS4.gdb

# Flow Accumulation
Flow_Acc = FlowAccumulation(Flow_Dir)          # Calculate the number of upstream cells that flow
into each cell using the flow accumulation tool
Flow_Acc.save(os.path.join(MS4,"flow_acc"))    # Save flow accumulation as "flow_acc" in
MS4.gdb

# ---------------------------------------------------------------------------------------------------------------------
# Name:                 Update_Outfalls.py
# Purpose:              This tool updates the latitude, longitude, unique ID, receiving waterbody,
                        local watershed, and 6th order HUC
#                       for each outfall.
# Author:               John P. Miller
# Copyright:(c)         Amec Foster Wheeler | Prince William County, Virginia
# ArcGIS Version:       10.2
# Python Version:       2.7.3
# ---------------------------------------------------------------------------------------------------------------------
# Import the Modules
import arcpy, sys, os
from arcpy import env
from arcpy.sa import *

# Checkout Spatial License (Required!)
arcpy.CheckOutExtension("spatial")

# Overwrite Existing Files!
```

```
arcpy.env.overwriteOutput = True

# Get Relative Paths
rootWS = os.path.dirname(sys.path[0])
MS4 = os.path.join(rootWS,'MS4.gdb')

# Set Environment Variables
arcpy.env.workspace = MS4
arcpy.env.scratchWorkspace = rootWS

# Set Globals Variables
inFlowDirection = os.path.join(MS4,"flow_dir")
inFlowAccum = os.path.join(MS4,"flow_acc")
Outfalls = os.path.join(MS4,"Outfalls")
DEM_proj = os.path.join(arcpy.env.scratchGDB,"DEM_proj")
DEM_resolution = arcpy.Describe(DEM_proj).meanCellHeight
InputFeatureClass_copy = os.path.join(arcpy.env.scratchGDB, "InputFeatureClass_copy")
outfall_WB = os.path.join(arcpy.env.scratchGDB, "outfall_WB")
outfall_ReceivingWB = os.path.join(arcpy.env.scratchGDB, "Outfall_ReceivingWB")
ReceivingWB_Pts = os.path.join(arcpy.env.scratchGDB, "ReceivingWB_Pts")
WB_pourpoints = os.path.join(arcpy.env.scratchGDB,"WB_pourpoints")
WB_outfall_poly = os.path.join(arcpy.env.scratchGDB, "WB_outfall_poly")
WB_outfall_da_ras = os.path.join(arcpy.env.scratchGDB,"WB_outfall_da_ras")
WB_sheds = os.path.join(arcpy.env.scratchGDB, "WB_sheds")
WB_da = os.path.join(arcpy.env.scratchGDB, "WB_da")
Polygons = os.path.join(MS4,"Polygons")
HUC12 = os.path.join(Polygons,"HUC12")
outfall_HUC = os.path.join(arcpy.env.scratchGDB,"outfall_HUC")
Subwatersheds = os.path.join(Polygons,"Subwatersheds")
outfall_sheds = os.path.join(arcpy.env.scratchGDB,"outfall_sheds")
outfall_layer = os.path.join(arcpy.env.scratchGDB,"outfall_layer")

# Prompt User for Outfalls Pathname
InputFeatureClass = arcpy.GetParameterAsText(0)
                                # Set outfalls as first parameter
if (not InputFeatureClass):
                                                # If statement to prompt for outfall feature class
   arcpy.AddMessage("Select the points you want to delineate")
        # Python message to appear when running as standalone script
   InputFeatureClass = raw_input("Enter the File Pathway for Your Delineation Points") # Prompts first
parameter

# Prompt User for NHD Flowline Pathname
nhdInput = arcpy.GetParameterAsText(1)                  # Set NHD_flowlines as second parameter
if (not nhdInput):                                                      # If statement to prompt for
polyline feature class
   arcpy.AddMessage("Select NHD Flowlines")      # Python message to appear when running as
standalone script
```

```
    nhdInput = raw_input("Enter NHD Flowlines") # Prompts second parameter

# Prompt User for Stormwater Network Pathname
networkInput = arcpy.GetParameterAsText(2)                                  # Set
Amec_Single_Network as third parameter
if (not networkInput):                                                      # If
statement to prompt for polyline feature class
    arcpy.AddMessage("Select Stormwater Network")                           # Python message to
appear when running as standalone script
    networkInput = raw_input("Enter Amec Single Network") # Prompts third parameter

# Add Unique IDs to Drainage Points Using "Outfall_ID" Field Name, Sequentially Created
existingFields = []                                                         # Empty list
for field in arcpy.ListFields(InputFeatureClass):       # Iterate over fields
    existingFields.append(field.name)                           # Add the attribute name to list for each
field

# Create String to Use as Field Name
Outfall_ID = "Outfall_ID"
if Outfall_ID not in existingFields:                                                    #
Verify if field "Outfall_ID" exists
    arcpy.AddField_management(InputFeatureClass, 'Outfall_ID', 'LONG')  # If field "Outfall_ID" doesn't
exists, create it
else:
                                # If above statement is false, then
    print "Outfall_ID field already exists, no need to add"                 # If field "Outfall_ID" does
exist, do nothing

# Calculate a Unique Identifier for Each Outfall Missing an ID in the 'Outfall_ID' Field (1, 2, 3, etc.)
with arcpy.da.UpdateCursor(InputFeatureClass, Outfall_ID) as rows:      # Create an update cursor
to go through each row in the Outfall_ID field
    for i, row in enumerate(rows, start=1):                 # For each value in row, a tuple is produced
with (counter, row); the for loop binds that to variable 'i' and row respectively
        if row[0] is None:                                  # If an outfall ID has not been assigned (in attribute
table as <NULL>)
            row[0] = i                                  # Substitute the index counter value (1, 2, 3, etc.) for
Outfall_ID value in each row
        elif row[0] is not None:                            # If an outfall ID has already been assigned (i.e. not
<NULL>)
            print "No IDs to add"                           # Do nothing
        rows.updateRow(row)                                 # Update this row in the table

# Create Points at the Intersection of the Stormwater and Stream Network
arcpy.Intersect_analysis([nhdInput, networkInput], ReceivingWB_Pts, "No_FID", DEM_resolution,
"point")

# Add Unique IDs to the Intersection Points Using "WB_Pt_ID" Field Name
WB_Fields = []                                                              # Empty list
```

```
for field in arcpy.ListFields(ReceivingWB_Pts):        # Iterate over fields
   WB_Fields.append(field.name)                              # Add the attribute name to list for each
field

WB_Pt_ID = "WB_Pt_ID"
                  # Create field name as string
if WB_Pt_ID not in WB_Fields:
         # Check if an ID number for the intersection points exists
   arcpy.AddField_management(ReceivingWB_Pts, 'WB_Pt_ID', 'LONG')  # If ID number does not
exist already, create field in attribute table
else:
                           # Otherwise
   print "WB_Pt_ID exists"
         # If field already exists skip

# Calculate a Unique Value for Each Receiving Waterbody Point (ReceivingWB_Pts) Starting with 1
(1, 2, 3, etc.)
with arcpy.da.UpdateCursor(ReceivingWB_Pts, WB_Pt_ID) as rows:                # Create an update
cursor to go through each row in the Outfall_ID field
   for i, row in enumerate(rows,1):                                                    # For each
value in row, a tuple is produced with (counter, row); the for loop binds that to variable 'i' and row
respectively
      row[0] = i
         # Substitute the index counter value (1, 2, 3, etc.) for Outfall_ID value in each row
      rows.updateRow(row)
         # Update this row in the table

# Snap Intersecting Points to Flow Accumulation Pathway to Ensure Proper Delineation
if arcpy.Exists(WB_pourpoints):                        # Check if this snap pour points raster already
exists
   arcpy.Delete_management(WB_pourpoints)       # If it already exists, delete it
else:                                                                  # Otherwise
   print "Snap pour points"                              # Do nothing

# Snap the points created from intersecting the Amec_Single_Network and NHD_flowlines to the
adjacent cell in the 3 x 3 cell window with the highest flow accumulation value
WB_outSnapPour = SnapPourPoint(ReceivingWB_Pts, inFlowAccum, DEM_resolution, "WB_Pt_ID")
WB_outSnapPour.save(WB_pourpoints) # Save output as WB_pourpoints

# Delineate Drainage Area to WB Points
if arcpy.Exists(WB_outfall_da_ras):                                          # Check if the
drainage area raster for the intersecting points exists
   arcpy.Delete_management(WB_outfall_da_ras)                        # If it already exists, delete
it
else:
         # Otherwise
  print "Delineate Receiving Water Body Drainage Areas"   # Do nothing
```

```
# Delineate the upstream watersheds for each downstream receiving waterbody
WB_outfall_da_ras = Watershed(inFlowDirection, WB_outSnapPour, "VALUE")
WB_outfall_da_ras.save(os.path.join(arcpy.env.scratchGDB,"WB_outfall_da_ras")) # Save output as
WB_outfall_da_ras

# Convert Raster Drainage Areas to Polygons
arcpy.RasterToPolygon_conversion(WB_outfall_da_ras, WB_outfall_poly, "SIMPLIFY", "VALUE")

# Dissolve Watersheds by Gridcode to Eliminate Tiny Watersheds
arcpy.Dissolve_management(WB_outfall_poly, WB_da, ["gridcode"], "", "MULTI_PART",
"DISSOLVE_LINES")

# Add Receiving Waterbody information to the Waterbody Drainage Area
arcpy.MakeFeatureLayer_management(WB_da, "Waterbody_area")                # Create feature
layer for dissolved polygon upstream watersheds for receiving waterbodies
arcpy.MakeFeatureLayer_management(ReceivingWB_Pts, "WB_points") # Create feature layer for
receiving waterbody points

arcpy.JoinField_management("Waterbody_area", "gridcode", "WB_points", "WB_Pt_ID") # Join
receiving waterbody point IDs to receiving waterbody drainage areas based on "gridcode"
arcpy.CopyFeatures_management("Waterbody_area", WB_sheds)
                        # Save a copy of the feature layer as a feature class named "WB_sheds"

# Create a Copy MS4 Outfalls to Facilitate Join
arcpy.CopyFeatures_management(InputFeatureClass, InputFeatureClass_copy) # Create a copy of
the outfalls
arcpy.MakeFeatureLayer_management(InputFeatureClass_copy, "CopyLayer")          # Make
feature layer from copy of outfalls
arcpy.DeleteField_management(InputFeatureClass_copy, ["REACHCODE"])                    # In
feature class that is a copy of the outfalls

#Use Spatial Join to Add Waterbody Drainage Area to User Selected Outfall Points
arcpy.SpatialJoin_analysis(InputFeatureClass_copy, WB_sheds, outfall_WB, "", "", "",
"COMPLETELY_WITHIN")    # Join attribute table from receiving waterbody drainage areas to the
copy of the outfalls
arcpy.JoinField_management(outfall_WB, "WB_Pt_ID", "CopyLayer", "Outfall_ID")
                                        # Join Outfall ID field from feature layer of outfalls

#Delete Unnecessary Fields
fields = arcpy.ListFields(outfall_WB)
                        # Create a list with all of the fields in new outfalls feature class that
contains the receiving waterbody "REACHCODE"
WBkeepFields = ["SHAPE", "OBJECTID", "Ownership", "Origin", "Outfall_ID", "REACHCODE"]  #
Create list with these relevant field names. "Shape" and "OBJECTID" required!
WBdropFields = [x.name for x in fields if x.name not in WBkeepFields]
        # Identify fields in outfall_WB that are not in the WBkeepFields list created above.
arcpy.DeleteField_management(outfall_WB, WBdropFields)
                        # Delete fields in outfall_WB not listed in WBkeepFields
```

```
# Use Spatial Join to Add 6th Order HUC Data
arcpy.SpatialJoin_analysis(outfall_WB, HUC12, outfall_HUC, "", "", "", "WITHIN")

# Remove Unneccessary Fields
arcpy.DeleteField_management(HUC12, ["Join_Count", "TARGET_FID"])

# Use Spatial Join to Add Local Watershed
arcpy.SpatialJoin_analysis(outfall_HUC, Subwatersheds, outfall_sheds, "", "", "", "WITHIN")

# Remove Unneccessary Fields
arcpy.DeleteField_management(outfall_sheds, ["Join_Count", "TARGET_FID", "Join_Count_1",
"TARGET_FID_1", "OBJECTID_1", "AREA", "PERIMETER", "SUBAREA", "SUBAREA_",
"SUBAREA_ID", "SYMBOL", "WMPLAN", "ACRES", "MAJSHED", "SHAPE_LENG", "SHD_NAME" ])

# Overwrite Initial Outfalls Feature Class (First Parameter)
arcpy.CopyFeatures_management(outfall_sheds, InputFeatureClass)

# Add Latitude and Longitude Fields to Outfalls
LONG_DD = "LONG_DD"

if LONG_DD in existingFields:
                        # If LONG_DD field exists
   arcpy.DeleteField_management(InputFeatureClass, ["LONG_DD", "LAT_DD"])# Delete Lat/Long
Fields
else:
                                    # Otherwise
   print "Need to add Lat/Long"
                # Do nothing

# Add Outfall Location in Decimal Degrees
arcpy.AddField_management(InputFeatureClass, 'LONG_DD', 'FLOAT', 7, 5)      # Add field for
longitude in decimal degrees
LAT_DD = "LAT_DD"
                        # Create string for field
arcpy.AddField_management(InputFeatureClass, 'LAT_DD', 'FLOAT', 7, 5)       # Add field for
latitude in decimal degrees

# Calculate Latitude and Longitude Decimal Degree Coordinates for the Outfall Points
dsc = arcpy.Describe(InputFeatureClass)
                        # Use "Describe" function to determine the shape type
prjFile = os.path.join(arcpy.GetInstallInfo()["InstallDir"],
        r"Coordinate Systems\Geographic Coordinate Systems\World\WGS 1984.prj") # Datum of
data for spatial reference
spatialRef = arcpy.SpatialReference(prjFile)
                        # Coordinate system that defines what map projection options are used to
define horizontal coordinates
```

```
updCursor = arcpy.UpdateCursor(InputFeatureClass,"", spatialRef)          # Establish read-write
access for outfalls
for row in updCursor:
        # Loop through each row in the outfall feature class
    shape = row.getValue(dsc.shapeFieldName)                                    # Create
geometry object 'shape'
    geom = shape.getPart(0)
        # Read geometry of each point
    x = geom.X
            # Store x from spatial reference
    y = geom.Y
            # Store y from spatial reference
    row.setValue('LONG_DD', x)
        # Add x value from spatial reference to the point in the field LONG_DD
    row.setValue('LAT_DD', y)                                                   # Add
y value from spatial reference to the point in the field LAT_DD
    updCursor.updateRow(row)
        # Updates the current row in the outfalls table

del updCursor, row # Close loop and delete cursor

# ---------------------------------------------------------------------------------------------------------------
# Name:                 Drainage_Area_Delineations.py
# Purpose:              This tool delineates the upstream area to a set of user defined points
                        and determines the percent of the
#                       drainage area that is pervious and impervious
# Author:               John P. Miller
# Copyright:(c)         Amec Foster Wheeler | Prince William County, Virginia
# ArcGIS Version:       10.2
# Python Version:       2.7.3
# ---------------------------------------------------------------------------------------------------------------

# Import the Modules
import arcpy, sys, os
from arcpy import env
from arcpy.sa import *

# Checkout Spatial License (Required!)
arcpy.CheckOutExtension("spatial")

# Overwrite Existing Files!
arcpy.env.overwriteOutput = True

# Get Relative Paths
rootWS = os.path.dirname(sys.path[0])
MS4 = os.path.join(rootWS,'MS4.gdb')

# Set Environment Variables
```

```
arcpy.env.workspace = MS4
arcpy.env.scratchWorkspace = rootWS

# Set Globals Variables
inFlowDirection = os.path.join(MS4,"flow_dir")
inFlowAccum = os.path.join(MS4,"flow_acc")
Polygons = os.path.join(MS4,"Polygons")
Outfalls = os.path.join(MS4,"Outfalls")
Interconnected = os.path.join(MS4,"Interconnected")
DEM_proj = os.path.join(arcpy.env.scratchGDB,"DEM_proj")
DEM_resolution = arcpy.Describe(DEM_proj).meanCellHeight
outfall_poly = os.path.join(arcpy.env.scratchGDB,"outfall_poly")
dis_outfall_da = os.path.join(arcpy.env.scratchGDB,"dis_outfall_da")
LandUse = os.path.join(MS4,"LandUse")
GMU = os.path.join(Interconnected,"GMU")
NOVA = os.path.join(Interconnected,"NOVA")
Schools = os.path.join(Interconnected,"Schools")
VDOT = os.path.join(Interconnected,"VDOT")
VPDES = os.path.join(Interconnected,"VPDES")
interconnected_ms4 = os.path.join(arcpy.env.scratchGDB,"interconnected_ms4")
Phase1_MS4 = os.path.join(arcpy.env.scratchGDB,"Phase1_MS4")
pervious_da = os.path.join(arcpy.env.scratchGDB,"pervious_da")
pervious_layer = os.path.join(arcpy.env.scratchGDB,"pervious_layer")
drainage_area = os.path.join(arcpy.env.scratchGDB,"drainage_area")
drainage_area_layer = os.path.join(arcpy.env.scratchGDB,"da_layer")
join_da = os.path.join(arcpy.env.scratchGDB,"join_da")
outfall_layer = os.path.join(arcpy.env.scratchGDB,"outfall_layer")
area_layer = os.path.join(arcpy.env.scratchGDB,"area_lyr")
all_areas = os.path.join(arcpy.env.scratchGDB,"all_areas")
drainage_area_selection = os.path.join(arcpy.env.scratchGDB,"drainage_area_selection")

# Set Raster Environment Settings
arcpy.env.snapRaster = DEM_proj
arcpy.env.cellSize = DEM_proj
arcpy.env.extent = DEM_proj

# Prompt User for Outfalls Pathname
InputFeatureClass = arcpy.GetParameterAsText(0) # Set outfalls as first parameter
if (not InputFeatureClass): # If statement to prompt for outfall feature class
   arcpy.AddMessage("Select your the points you want to delineate") # Python message to appear
when running as standalone script
   InputFeatureClass = raw_input("Enter the File Pathway for Your Delineation Points") # Prompts first
parameter

# Prompt User for Attribute Field
InputField = arcpy.GetParameterAsText(1) # Set 'user' selected field name as second parameter
if (not InputField): # If statement to prompt users to decide which field they would like to select outfalls
by
```

```
        arcpy.AddMessage("Select Input Field") # Python message to appear when running as
standalone script
        InputField = raw_input("Enter Input Field") # Prompts second parameter

# This Choice List is Populated Dynamically from Unique Values in the Input Field Defined in the
Second Parameter (InputField)
InputValue = arcpy.GetParameterAsText(2) # Select field values for the third parameter
if (not InputValue): # If statement to prompt for values
        arcpy.AddMessage("Select Areas to Delineate") # Python message to appear when running
as standalone script
        InputValue = raw_input("Enter Subset") # Prompts third parameter

# The Selected Value of Parameter 2 is Passed to Set Parameter 3 Output
arcpy.SetParameter(3, InputValue)

# Prompt User for Representative Impervious Cover (i.e. 2009 for Phase 1)
impervious_area = arcpy.GetParameterAsText(4) # Select impervious cover dataset for the fifth
parameter
if (not impervious_area): # If statement to prompt for feature class
   arcpy.AddMessage("Select the impervious cover") # Python message to appear when running as
standalone script
   impervious_area = raw_input("Enter the File Pathway for Your Impervious Area") # Prompts fifth
parameter

# Prompt User for Interconnected MS4s
other_ms4s = arcpy.GetParameterAsText(5) # Select impervious cover dataset for the fifth parameter
if (not other_ms4s): # If statement to prompt for feature class
   arcpy.AddMessage("Select all other MS4s from 'Interconnected' folder") # Python message to
appear when running as standalone script
   other_ms4s = raw_input("Enter interconnected MS4s") # Prompts sixth parameter

# Prompt User for Delineated Areas Output Location
outfall_area = arcpy.GetParameterAsText(6) # Select output location for the fifth parameter
if (not outfall_area): # If statement to prompt for pathname
   arcpy.AddMessage("Add Delineated Areas Output Location") # Python message to appear when
running as standalone script
   outfall_area = raw_input("Enter Output Location") # Prompts seventh parameter

# Snap Drainage Delineation Points to Flow Accumulation Pathway to Ensure Proper Delineation
Outfall_ID = "Outfall_ID" # Create Outfall_ID string for field name
outSnapPour = SnapPourPoint(InputFeatureClass, inFlowAccum, DEM_resolution, Outfall_ID) # Snap
outfalls to the adjacent cell in the 3 x 3 cell window with the highest flow accumulation value
outSnapPour.save(os.path.join(arcpy.env.scratchGDB,"pourpoints")) # Save snap pour points output
as "pourpoints"

# Delineate Drainage Area to MS4 Outfalls
outfall_da_ras = Watershed(inFlowDirection, outSnapPour, "VALUE") # Delineate upstream
contributing area to each snapped outfall
```

```
outfall_da_ras.save(os.path.join(arcpy.env.scratchGDB,"outfall_da")) # Save drainage areas

# Convert Raster Drainage Areas to Polygons
arcpy.RasterToPolygon_conversion(outfall_da_ras, outfall_poly, "SIMPLIFY", "VALUE")

# Dissolve Watersheds by Gridcode to Eliminate Tiny Watersheds
arcpy.Dissolve_management(outfall_poly, drainage_area, ["gridcode"], "", "MULTI_PART",
"DISSOLVE_LINES")

# Merge Interconnected MS4s.
splitMS4s = other_ms4s.split(";")
if splitMS4s ==['']:
   z = 0
else :
   z = len(splitMS4s)

if z == 0 : # If no interconnected MS4s are selected
         Phase1_MS4 = drainage_area # Skip merging interconnected MS4 polygons
elif z == 1: # If there is 1 other MS4
   arcpy.Merge_management([splitMS4s[0]], interconnected_ms4)
elif z == 2: # If there are 2 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1]], interconnected_ms4)
elif z == 3: # If there are 3 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2]], interconnected_ms4)
elif z == 4: # If there are 4 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3]],
interconnected_ms4)
elif z == 5: # If there are 5 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4]],
interconnected_ms4)
elif z == 6:  # If there are 6 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],
splitMS4s[5]], interconnected_ms4)
elif z == 7: # If there are 7 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],
splitMS4s[5], splitMS4s[6]], interconnected_ms4)
elif z == 8: # If there are 8 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],
splitMS4s[5], splitMS4s[6], splitMS4s[7]], interconnected_ms4)
elif z == 9: # If there are 9 other MS4s
   arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],
splitMS4s[5], splitMS4s[6], splitMS4s[7], splitMS4s[8]], interconnected_ms4)
else:
   print "Other MS4s not selected"
   arcpy.AddError("No other MS4s selected, output will not reflect interconnected MS4s")

# Erase Interconnected MS4's from MS4 Area
if z > 0: # If there are interconnected ms4s
```

```
    arcpy.Erase_analysis(drainage_area, interconnected_ms4, Phase1_MS4) # Erase them from the
outfall drainage area
else: # If there are not interconnected ms4s
    print "No interconnected MS4s" # Skip this step
    arcpy.AddError("No other MS4s selected, output will not reflect interconnected MS4s")

# Calculate Total Acres in Each Drainage Area
arcpy.AddField_management(Phase1_MS4, 'TotAcres', 'DOUBLE') # Add field for total acres in each
drainage area
arcpy.CalculateField_management(Phase1_MS4, 'TotAcres', '!shape.area@acres!', 'PYTHON') #
Calculate total drainage area in acres and store in 'TotAcres' field

# Erase Impervious Area from Drainage Area
arcpy.Erase_analysis(Phase1_MS4, impervious_area, pervious_da)

# Add Pervious Acres Field and Calculate Geometry
arcpy.AddField_management(pervious_da, 'PervAcres', 'DOUBLE') # Add field for pervious acres in
each drainage area (i.e. area remaining after erasing impervious area from each drainage area)
arcpy.CalculateField_management(pervious_da, 'PervAcres', '!shape.area@acres!', 'PYTHON') #
Calculate pervious drainage area in acres and store in 'PervAcres' field

# Create Feature Layers for Join
arcpy.MakeFeatureLayer_management(Phase1_MS4, drainage_area_layer) # Create feature layer of
total drainage areas for each outfall
arcpy.MakeFeatureLayer_management(pervious_da, pervious_layer) # Create feature layer of
pervious drainage areas for each outfall

# Join Pervious Area to the Dissolved MS4 Drainage Areas
arcpy.AddJoin_management(drainage_area_layer, "gridcode", pervious_layer, "gridcode") # Join
pervious area feature layer to total drainage area layer based on gridcode
arcpy.CopyFeatures_management(drainage_area_layer, join_da) # save joined pervious/total
drainage feature layer as feature class named 'join_da'

# Remove Attribute Table Fields That Are Not Necessary
arcpy.DeleteField_management(join_da, ["pervious_da_OBJECTID", "pervious_da_gridcode",
"pervious_da_TotAcres"])

# Remove Any <Null> Values and Replace with 0
codeblock = """def calc(pervious_da_PervAcres):
    if pervious_da_PervAcres is None:
        return 0
    else:
        return pervious_da_PervAcres"""
arcpy.CalculateField_management(join_da, 'pervious_da_PervAcres',
"calc(!pervious_da_PervAcres!)", 'PYTHON', codeblock) # Inserts codeblock SQL statement to
change any Null pervious area value to 0 to facilitate impervious area calculation

# Calculate Impervious Area
```

```
arcpy.AddField_management(join_da, 'ImpAcres', 'DOUBLE') # Add field for impervious acres named 'ImpAcres'
arcpy.CalculateField_management(join_da, 'ImpAcres', '!Phase1_MS4_TotAcres!-!pervious_da_PervAcres!', 'PYTHON') # Calculate impervious area by subtracting pervious drainage area from the total drainage area for each outfall

# Create Feature Layers for Join
arcpy.MakeFeatureLayer_management(InputFeatureClass, outfall_layer) # Create feature layer from outfall feature class
arcpy.MakeFeatureLayer_management(join_da, area_layer) # Create feature layer from drainage area polygon feature class containing total, impervious, and pervious for each outfall

# Join Outfall Ownership and Origin Information
arcpy.JoinField_management(area_layer, "Phase1_MS4_gridcode", outfall_layer, Outfall_ID, InputField + ";Origin;Outfall_ID;VAHU6;HUC_12;WTRSHD_ID;REACHCODE") # Join outfall information to the drainage area feature class and keep relevant field for the permit
arcpy.CopyFeatures_management(area_layer, all_areas) # Create a feature class for drainage area feature class containing all relevant information for outfalls and drainage areas
arcpy.DeleteField_management(all_areas, "Phase1_MS4_gridcode") # Delete unnecessary field that resulted from join

# Split User Input Into List
InputString = str(InputValue) # Create string from the third parameter to be parsed through statement below
SaveSplit = InputString.split(";") # Split string from the third parameter, so that each value in the field is it's own string

# Create Variable to be Used in Logical Statement to Build SQL statement
x = len(SaveSplit) # Calculate how many unique values are in the field from parameter 3 (e.g. if Ownership is the field and it has County, Homeowner, & Commercial as possible values the length would be 3)
exp1 = str(InputField) + " = '" + str(SaveSplit[0]) + "'" # SQL statement that selects the first value (SaveSplit[0]) from the field selected in parameter 3

# Logical Sequence Building SQL Expression, Based upon Number of User Inputs for the Third Parameter (GetParameterAsText(2)) (x)
if x <2 : # if the number of unique values selected by the user is 1
        sql_exp = exp1 # SQL selection statement takes the selected field (second parameter) and selects the first field value (third parameter)
elif 3> x >1: # if the number of unique values selected by the user is 2
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'"  # SQL selection statement takes the selected field (second parameter) and selects the first and second field value (third parameter)
elif 4> x >2: # if the number of unique values selected by the user is 3
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[2]) + "'" # SQL selection statement takes the selected field (second parameter) and selects the first, second, & third field value (third parameter)
elif 5> x >3: # if the number of unique values selected by the user is 4
```

```
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" # SQL selection
statement takes the selected field (second parameter) and selects the first, second, third, & fourth
field value (third parameter)
elif 6> x >4: # if the number of unique values selected by the user is 5
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" + " OR " +
str(InputField) + " = '" + str(SaveSplit[4]) + "'" # SQL selection statement takes the selected field
(second parameter) and selects the first, second, third, fourth, & fifth field value (third parameter)
elif 7> x >5: # if the number of unique values selected by the user is 6
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" + " OR " +
str(InputField) + " = '" + str(SaveSplit[4]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[5]) + "'
elif 8> x >6: # if the number of unique values selected by the user is 7
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" + " OR " +
str(InputField) + " = '" + str(SaveSplit[4]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[5]) + "'
+ " OR " + str(InputField) + " = '" + str(SaveSplit[6]) + "'
elif 9> x >7: # if the number of unique values selected by the user is 8
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" + " OR " +
str(InputField) + " = '" + str(SaveSplit[4]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[5]) + "'
+ " OR " + str(InputField) + " = '" + str(SaveSplit[6]) + "'" + " OR " + str(InputField) + " = '" +
str(SaveSplit[7]) + "'
elif 10> x >8: # if the number of unique values selected by the user is 9
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" + " OR " +
str(InputField) + " = '" + str(SaveSplit[4]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[5]) + "'
+ " OR " + str(InputField) + " = '" + str(SaveSplit[6]) + "'" + " OR " + str(InputField) + " = '" +
str(SaveSplit[7]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[8]) + "'
elif 10> x >8: # if the number of unique values selected by the user is 10
    sql_exp = exp1 + " OR " + str(InputField) + " = '" + str(SaveSplit[1]) + "'" + " OR " + str(InputField) +
" = '" + str(SaveSplit[2]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[3]) + "'" + " OR " +
str(InputField) + " = '" + str(SaveSplit[4]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[5]) + "'
+ " OR " + str(InputField) + " = '" + str(SaveSplit[6]) + "'" + " OR " + str(InputField) + " = '" +
str(SaveSplit[7]) + "'" + " OR " + str(InputField) + " = '" + str(SaveSplit[8]) + "'" + " OR " + str(InputField)
+ " = '" + str(SaveSplit[9]) + "'
elif x > 10: # if the number of unique values is more than 10, all values will be selected.
        sql_exp = InputField
else:
    print "Too many unique values to select"
    arcpy.AddError("No outfalls selected, output will be empty")

# Select Choice List Selections from the Input Feature Class
arcpy.Select_analysis(all_areas, drainage_area_selection, sql_exp)

arcpy.CopyFeatures_management(drainage_area_selection, outfall_area) # Save output of drainage
areas with user selected field values (e.g. County owned outfalls)
```

7 Appendix B: Forested Lands Delineation Process

PURPOSE

In order to support service area delineation and the land use change BMP, forested areas were quickly delineated from 4-band multispectral imagery at 1 meter spatial resolution. Existing available land cover information for Prince William County is available from the Multi-Resolution Land Characteristics Consortium (MRLC), National Land Cover Database (NLCD). However, the NLCD products were derived at 30m spatial resolution, limiting detail and potentially including a very large amount of estimation error when considering BMP's at a local scale. For example, when considering 900m^2 contiguous forested area, 2 pixel results at 30m resolution would be identified as a forested area from the NLCD dataset. Unfortunately, most remote sensing processes may take effort in reducing such small classification results as anomalous, and therefore remove small, but in this case, significant contiguous pixel results. By utilizing 1 meter resolution imagery products tree canopy detection was rapidly delineated, and higher resolution allowed multiple pixel clusters to be identified meeting the 900m^2 minimum mapping unit with higher confidence. Image processing was conducted using ERDAS Imagine, ArcGIS, and Feature Analyst software packages.

IMAGERY

The United States Department of Agriculture (USDA), National Agricultural Inventory Program (NAIP) provides ortho-corrected multispectral imagery with 1 meter spatial resolution at no cost over most of the United States. The multispectral imagery consists of typical blue, green, and red imagery bands for natural color representation, along with 4th band that covers the near infrared part of the electromagnetic spectrum. The near infrared band allows rapid vegetation detection through indices and classification techniques due to its sensitive response to chlorophyll from plant material. Healthy plants absorb red, green, and blue light, and reflects higher levels of infrared energy. Additionally, the near infrared bands allows the ability to segregate healthy from stressed vegetation by detecting different levels of near infrared reflection after identifying the presence of chlorophyll initially.

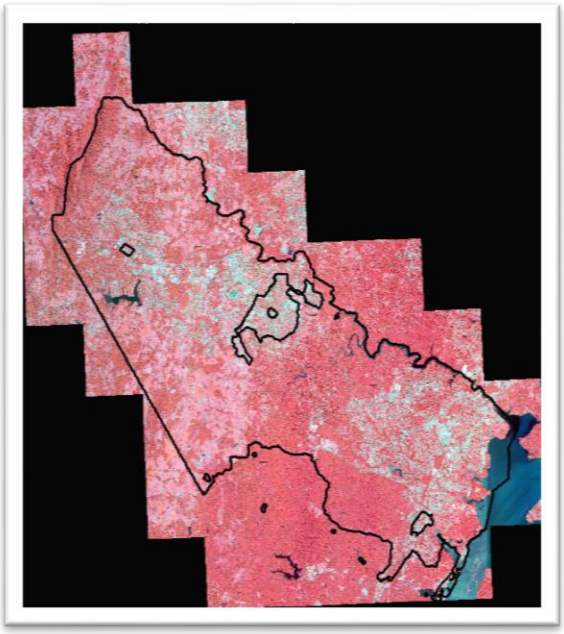
PROCESSING

The image processing used for this delineation consisted of three primary steps: 1) Image Pre-Processing, 2) Image Processing, and 3) Image Post-Processing. The area of interest (AOI) utilized consisted of areas within the Prince William County service area alone. No other MS4 areas were included in this delineation.

7.0.1 Image Pre-Processing

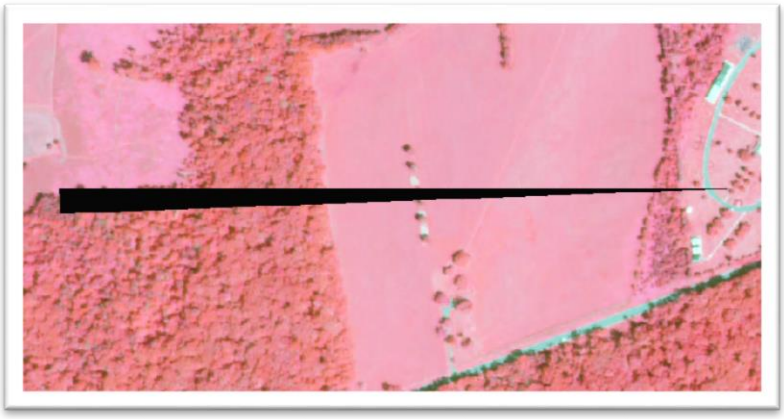
Pre-Processing tasks include AOI delineation, image collection, imagery quality review, and initial vegetation extraction. A buffer of 500ft around the study AOI prior to image processing in order to account for edge detection anomalies that typically occur with automated image extraction. Once complete, NAIP imagery was collected at the extent of the buffer to ensure complete coverage as

available. NAIP imagery at 4-band resolution is provided at DOQQ extents and readily available from the USGS EarthExplorer website (http://earthexplorer.usgs.gov/). A total of 43 NAIP tiles were downloaded and produced into a seamless mosaic product covering the AOI, and were collected in August, 2014:



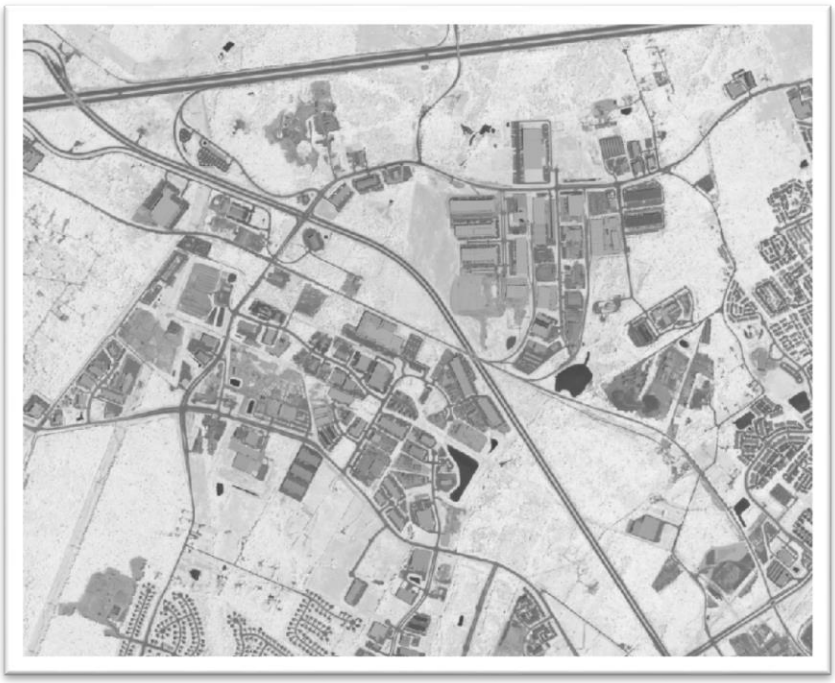
(*Mosaic NAIP imagery with Color Infrared Representation)*

The mosaic product was reviewed for seamlines and raw data anomalies such as band striping or dropped pixels. No band striping or seamlines were found in the mosaic dataset, and only minor areas of dropped pixels were identified. However, the areas with dropped pixels were not covering vast areas and did not require additional image datasets to rectify; dropped pixels were accounted for in the post processing phase due to limited impact on initial classification:



The final step of the pre-processing phase utilized the Normalized Difference Vegetation Index (NDVI) to segregate the image between vegetation and non-vegetation features. This is rapidly done due to

the way chlorophyll reflects energy in the near infrared band by using band math which results in a new raster data set with pixels containing values ranging from -1 to 1. Pixels with values closer to 1 represent vegetation, while those closer to -1 are non-vegetation.

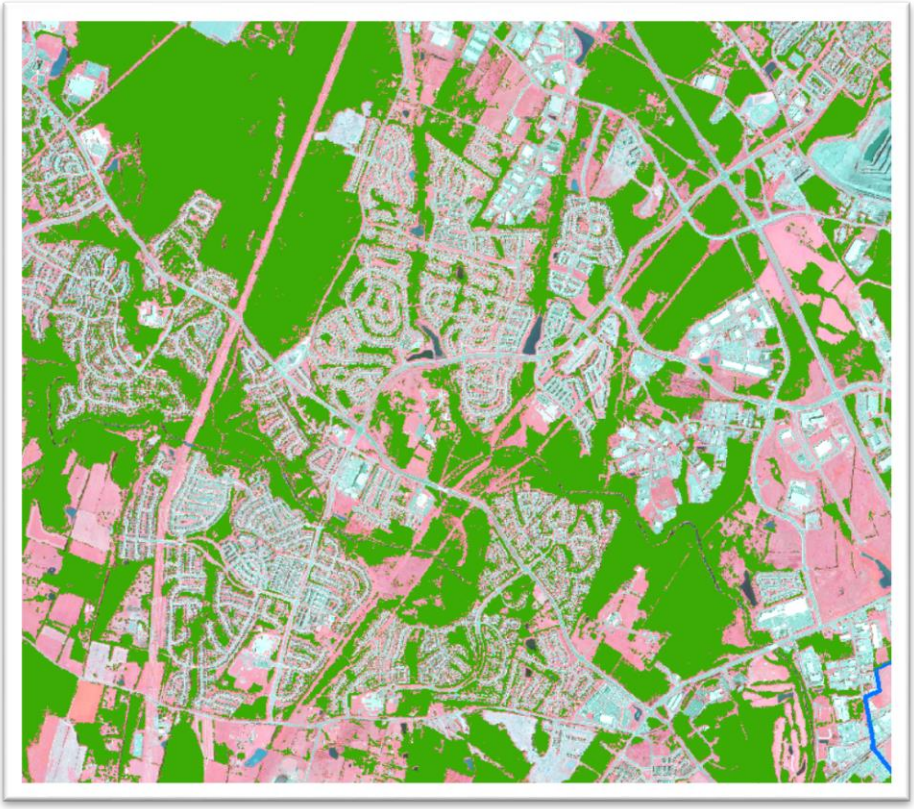


(NDVI Result showing vegetation and non-vegetation)

The NDVI result was then reviewed to locate the correct threshold where a representative split between vegetation and non-vegetation could be identified. Once determine, the NDVI dataset was rendered to a 2-class result, where vegetation pixels were utilized as an analysis mask where tree canopy could be identified. The threshold was set a bit higher for this study since trees tend to reflect much higher values (i.e. much closer to 1) given their height and foliage. This result also reduces false detections within open fields, dry grasslands, and shorter shrub areas:

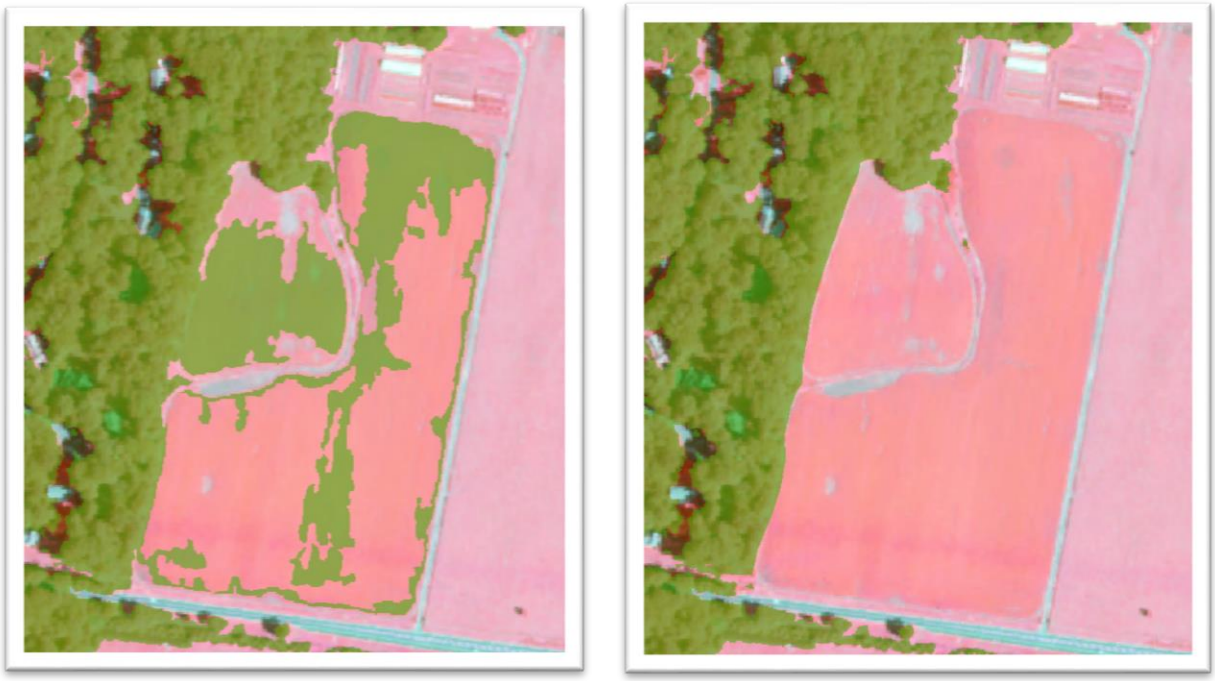
7.0.2 Image Processing

In order to identify tree canopy in Prince William County, multiple processing techniques and software packages were used to gain the best possible results. Initially, unsupervised image classification was performed, segregating the raw image into 50 different classes of statistically similar pixels. The 50 class clusters were reviewed and identified as belonging to tree canopy, water, grass, impervious surfaces, and unclassified (shadow) areas. The tree canopy clusters were then saved as new AOI's within ERDAS Imagine, and augmented with digitized samples in all locations of the study area. These samples were then supplied in the Maximum Likelihood Supervised Classification algorithm, with 2 – class fuzzy results and distance layers being produced. "Fuzzy" pixel results showed similarity between 2 possible land cover classes, and the distance result was utilized to effectively place the fuzzy pixels in the more statistically correct class. Feature Analyst is a separate classification algorithm that focuses more on feature shape along with spectral variability. Training samples were then applied to Feature Analyst, where iterations of results were performed to obtain the cleanest results. By utilizing shape as a detection method, similar patterns can be segregated in the image, also allowing for the reduction in misclassification from shadows. Once complete, all results were then merged into a single layer and clipped to the NDVI vegetation results and non-buffered MS4 AOI.



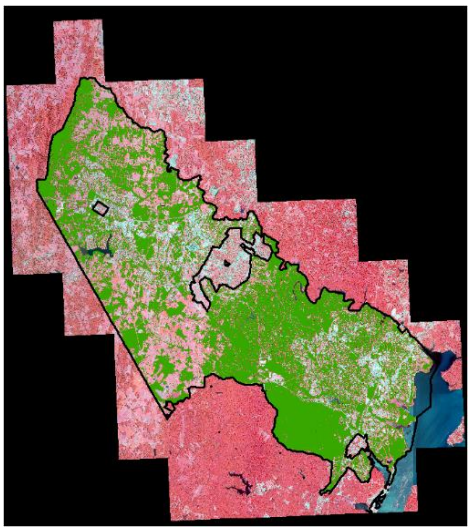
7.0.3 Image Post-Processing

Post processing tasks included image result aggregation and manual QA/QC procedures. Image processing result aggregation is a procedure used to fill small holes in otherwise continuous features and remove salt-and-pepper results by defining an arbitrary minimum mapping unit. The results from this process further clean extracted features of interest which can substantially improve estimations and metrics performed across the dataset. The manual QA/QC period performed looked for final anomalies in the resulting dataset that should not exist. Such anomalies include misclassification of commission and omission. In these cases, either polygons were added to fill in a missing area or polygons were trimmed to remove unnecessary features. Typical errors of omission exist in the middle of large forests, where trees cast shadows amongst each other. Typical errors of commission tend to exist in agricultural areas and golf courses where grasses and fields are very lush and mowed with varying patterns.



7.0.4 FINAL DATA SET DESCRIPTION AND ACCURACY STATEMENT

The final data set was produced using remote sensing techniques, which represent target features with a reasonable estimation or approximation. This is due to the possibility of remaining errors of omission and commission, spatial resolution limitations, and temporal capabilities. The estimations and representation of these results is based on the surface conditions at the time of imagery collection (8/2014). Polygon features are dissolved and exploded to ensure continuous feature representation, while maintaining topology with non-multipart feature representation. Estimated accuracy of the forest area delineation is approximately 80-85%. This is reasonable for the purposes of the service area delineation and land use BMP study. It is recommended that additional manual QA/QC be performed if this dataset is needed for official UTC classification, along with a minimum of 5-Class land cover computation



Appendix I – County Facilities

Table of Contents

100 INTRODUCTION

Pursuant to the federal Clean Water Act, 33 U.S.C. § 1251, *et seq.*, the Virginia Stormwater Management Act, Va. Code § 62.1-44.15:24, *et seq.*, and Prince William County Code of Ordinances Chapter 23.2 and regulations adopted pursuant thereto, Prince William County is authorized to discharge in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in state permit No. VA0088595.

100.1 PURPOSE

This policy establishes methods for controlling the discharge of pollutants from the municipal separate storm sewer system (MS4) into state waters, in compliance with requirements of Virginia Stormwater Management Program permit issued to Prince William County government (PWC).

100.2 SCOPE

The following written illicit discharge policy has been established for all County locations and applies to any potential discharge or pollutant which could be generated during the normal course of business.

100.3 AUTHORIZATION

This policy is authorized by the County Executive.

100.4 APPLICABILITY

This policy applies to all County agencies/departments including those with Independent Boards, with the exception of the Prince William County Schools and Prince William County Service Authority.

100.5 RESPONSIBILITY

Agency/Department Directors or designees shall:

- Ensure department specific standard operating procedures (SOPs) are developed, implemented and maintained for activities impacted by this policy.
- Ensure all MS4 SOPs are internally approved by the Department of Public Works, Environmental Services Division.
- Ensure all applicable policies, procedures and internal SOPs are available to impacted agencies and personnel responsible for monitoring and ensuring compliance.

- Assign roles and responsibilities as applicable, for all policies, procedures and SOPs under the "control" or "ownership" of his/her individual agency/department,
- Ensure all training requirements are met.
- Report any noncompliance issues including any spill or discharge.

Department of Public Works, Environmental Services Division shall:

- Provide support to departments and agencies in the implementation of this policy.
- Submit annual reports and any other formal communications that reference MS4 activities to regulatory bodies.
- Disseminate information, updates, and responsibilities to departments and agencies concerning compliance with permit requirements.
- Approve department specific SOPs pertaining to MS4 compliance.
- In conjunction with Risk Management periodically inspect high-risk facilities.
- Respond to specific departmental compliance inquiries and provide technical knowledge.
- Notify impacted departments of annual reporting requirements

Risk Management shall:

- Ensure that all departments are aware of and comply with this policy through inspection and program audits.
- Provide technical assistance to departments and agencies for all aspects of this policy when requested.
- Assist agencies and departments in facilitating pertinent training.
- Notify Environmental Services of any reported noncompliance issues at County facilities including fuel spills and illicit discharges, along with any follow up actions taken.

Employees shall:

- Comply with this policy and SOPs set forth by department management.
- Attend all required training.
- Inform supervisor of spills and discharges.

100.6 EXCEPTIONS

Exceptions to this policy must be approved in writing by the County Executive or designee.

100.7 DEFINITIONS

Allowable Discharge - any direct or indirect discharge that is authorized by the MS4 permit.

Contractor - an individual or company, including a subcontractor, hired by PWC government to perform services within PWC.

Clean Water Act (CWA)- the federal Clean Water Act (33 U.S.C. §1251 et seq.) and any subsequent amendments thereto

Discharge – allowable liquid, gas, or other substances that enter a storm drainage system.

Hazardous Material Personnel- County personnel responsible for responding to incidents related to hazardous materials.

Illicit Discharge- any direct or indirect non-stormwater discharge into the storm drain system not authorized by the MS4 permit.

Illicit Connections- either of the following: (1) any drain or conveyance, whether on the surface or subsurface, which allows an illicit discharge to enter the storm drain system including but not limited to any conveyances which allow any non-stormwater discharge including sewage, process waste water, and wash water to enter the storm drain system and any connections to the storm drain system from indoor drains to sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved, by the County or, (2) any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by the County.

MS4 (Municipal Separate Storm Sewer System) - a conveyance or system of conveyances, otherwise known as a municipal separate storm sewer system or "MS4" including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains, designed or used for collecting and conveying stormwater.

MS4 Permit- a permit issued to Prince William County that authorizes the discharge of stormwater from all existing and new municipal separate stormsewer point source discharges to surface waters of the State and includes a comprehensive planning process involving public participation and intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA and regulations, and this article and its

attendant regulations, using management practices, control techniques, and system, design, and engineering methods, and such other provisions that are appropriate.

Pollutant – anything which causes or contributes to pollution. This may include but is not limited to: paints, chemicals, soap, wash water, oil, automotive fluids, non-hazardous liquid and solid wastes, yard wastes, garbage, pesticides, herbicides, fertilizers, hazardous substances and wastes, animal wastes, dissolved and particulate metals, leaves and yard clippings, and particulates such as soil, sand and salt.

Potable Water- water that is deemed safe to drink or to use for food preparation, without risk of health problems.

Spill Prevention Control and Countermeasure (SPCC) Plan - a federally required and defined plan for facilities storing over 1,320 gallons of oil (fuel) cumulatively at a site including tanks, generators, and drums of oil (fuel).

Standard Operating Procedure (SOP) – SOPs are those policies/procedures related only to the internal operations of an agency/department, division or other sub-unit thereof. SOPs are not communicated or meant to provide direction to any external agency/department. Other names for SOPs include, but are not limited to: general orders, desk manuals, procedures, field guides, process flowcharts, and checklists, etc.

Storm Drainage System- facilities by which stormwater is collected and/or conveyed including but not limited to any roads with drainage systems, streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detentions basins, natural and human made or altered drainage channels, reservoirs, and other drainage structures.

Storm Water – precipitation that is discharged across the land surface of through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.

Policy – Policies are directives for the conduct of County business affairs and are often in support of higher level of authority dictates such as County Code or Ordinance; Board of County Supervisor Resolutions, County Executive Order, the County's Strategic Plan, compliance with federal laws and standards, the Code of Virginia or other regulatory agency as defined by law or contract.

Procedure – Procedures are the steps required to ensure policies are followed. Procedures are more detailed in nature and communicate operational requirements to internal and external staff for a specific transaction or a business cycle.

100.8 KEY RISK FACTORS

1. Policies, procedures and internal SOPs are inconsistent or not properly documented, approved and disseminated.
2. Policies, procedures and internal SOPs are not reviewed and updated on a systematic basis.
3. Departments and agencies may overlook responsibilities and fail to report permit violations or annual reporting requirements.

200 ILLICID DISCHARGE ELIMINATION AND MS4 PERMIT COMPLIANCE POLICY

200.1 ILLICIT DISCHARGES

No County employee, visitor, contractor, department, or agency shall cause or allow discharges into the PWC storm drainage system which are not composed entirely of stormwater, except for the allowed discharges listed below in Section 200.2. Prohibited discharges include, but are not limited to: paints, chemicals, soap, wash water, oil, automotive fluids, non-hazardous liquid and solid wastes, yard wastes, garbage, pesticides, herbicides, fertilizers, hazardous substances and wastes, animal wastes, dissolved and particulate metals, leaves and yard clippings, and particulates such as soil, sand and salt.

200.2 ALLOWABLE DISCHARGES

Allowable discharges are identified in the MS4 permit and include, but are not limited to the following:

- Landscape irrigation (sprinklers) and other potable water discharges
- Air conditioning condensation
- Fire-fighting emergency activities
- Other unforeseen activities that Environmental Services deems as allowable under the permit

200.3 ILLICIT CONNECTIONS

The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited. This expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

200.4 GOOD HOUSEKEEPING REQUIREMENTS

200.4.1 VEHICLE AND EQUIPMENT WASHING AND MAINTAINANCE

County vehicles shall be washed at a commercial car wash facility whenever possible. For oversize or specialty equipment and vehicles that require specialty cleaning, washing must be done in a way that prevents runoff water from entering storm drains. This includes:

- Using waterless washing products or a phosphate-free, pH neutral soap, and
- Washing on a grassy area or gravel, where all runoff water infiltrates the ground, or
- Capturing all runoff so no discharge occurs

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.4.2 VEHICLE AND EQUIPMENT FUELING

All fuel tanks, generators, and fueling stations at Prince William County facilities must have a spill response kit that is labeled, visible to users, and stocked at all times.

County personnel must remain at the pump during vehicle and equipment fueling. Should a spill occur or be discovered, personnel must respond by:

- utilizing a clean-up kit,
- notifying the County's fuel vendor via self-dial phones posted at Garfield and Western District fueling stations, and/or
- dialing 911 for significant or hazardous spills

For spills of all sizes, a spill report form must be completed following protocol found in section 200.6.

All spent cleanup supplies must be properly disposed. Risk Management can assist departments in making arrangements.

200.4.3 OUTDOOR STORAGE OF EQUIPMENT AND MATERIALS

Outdoor storage of equipment and materials not in regular use should be temporary and kept to a minimum. When storing equipment and materials outdoors, the following conditions must be met:

- Store materials and equipment as far away from storm drains and water bodies as feasible
- Cover and protect materials stored outside from rainfall and wind dispersal
- Keep outdoor storage containers in good condition
- Conduct regular inspections of storage areas

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.4.4 OUTDOOR STORAGE OF CHEMICALS

Outdoor storage of chemicals should be temporary and kept to a minimum. When storing chemicals outside, the following conditions must be met:

- Store chemicals as far away from storm drains and water bodies as feasible
- Seal storage containers and ensure they are impervious to rainfall
- Keep outdoor storage containers properly labeled and in good condition
- Store containers so they are not in direct contact with the ground
- Store containers in a way that prevents damage from vehicle and equipment impacts, wind damage, or any other external force
- Conduct regular inspections of storage areas

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.4.5 ROAD, STREET, AND PARKING LOT DEICING/MAINTENANCE

Deicing and other maintenance activities performed in roads, streets, and parking lots must be done in a way to minimize discharge. When performing these activities, the following conditions must be met:

- Deicing
    - Store and transfer de/anti-icing materials on an impervious containment pad or an equivalent containment area and/or under cover
    - Do not use deicing agents containing urea, or other forms or nitrogen or phosphorus
    - Avoid applying chemical deicing agents when the temperature is less than 15ºF
    - Use the lowest application rate of deicing chemicals possible to loosen snow and ice for further removal by shovel or plow
- Maintenance
    - Use an approved vendor for parking lot sweeping services and, per the contract requirements, confirm the collected debris is:
        - removed from the property within 4 hours of collection (no stockpiling),
        - kept out of storm drains, and

- properly disposed of at an approved site

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.4.6 PESTICIDE, HERBICIDE, FERTILIZER APPLICATION, STORAGE, TRANSPORT AND DISPOSAL

Application, storage, transport, and disposal of any pesticide, herbicide, and fertilizer products must be done in a manner that minimizes the impact to the environment to the greatest extent practicable. When performing these activities, the following conditions must be met:

Application

- Apply materials on an as needed basis only
- Do not exceed application rates defined on packaging
- Utilize only properly trained or certified personnel to perform applications of these chemicals

Storage

- Store all pesticide, herbicides and fertilizer indoors or under covered areas, with proper labeling on both the containers and the storage structure
- Conduct regular inspections of storage areas

Transport

- Secure materials during transport to prevent spills and/or utilize secondary containment
- Equip vehicles that transport liquid products with a spill kit

Disposal

- Dispose of expired and unwanted materials through a qualified, contracted County vendor
- Maintain records of material disposal indefinitely

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.4.7 FIRE-FIGHTING TRAINING

Fire-fighting training activities must be performed in a manner that minimizes the impact to the environment to the greatest extent practicable. When performing these activities, the following conditions must be met:

- Direct water flows to grass or gravel areas or contain the water onsite and allow it to evaporate and infiltrate
- Block off all potentially affected storm drain inlets and direct or pump water to sanitary sewer or grass or gravel infiltration area

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.4.8 FUEL TANKS, GENERATORS AND OTHER OIL/FUEL STORAGE

All oil (including cooking oil) and fuel containers must be maintained and utilized in a manner that prevents leaks, spills and discharges. All drums, tanks, generators or other outdoor oil/fuel storage containers must comply with the following:

- With the exception of cooking oil storage, ensure secondary containment is utilized, either through container design or added structure
- Properly label equipment and containers and ensure they are free of drips, leaks, and film, and that the ground/pavement around it is, too
- Ensure filling and dispensing by vendors is done in accordance with County policy and that any spill is reported in accordance with 200.6 of this policy
- Inspect equipment and containers regularly and ensure any needed repairs are made in a timely manner
- Place a spill response kit near the equipment or container and ensure it is labeled, stocked, and visible to others at all times

200.4.9 SWIMMING POOL DE-CHOLORINATION

During daily back-washing operations and annual flushing, steps must be taken to minimize the level of chlorine in discharge water to the greatest extent practicable. This can be achieved by:

- Direct water flows to grass or gravel areas or contain the water onsite and allow it to evaporate and infiltrate
- For annual flushing, de-chlorinate the water either chemically with appropriate products, or naturally through a 10-day retention period with no chlorine addition prior to release
- Verify chlorine and pH levels prior to release during annual flushing, with pH levels falling between 6.0 and 8.0 and free chlorine levels of 0.01 mg/l or less
- Release discharge from annual flushing at a controlled rate, as slowly as reasonably feasible

Should site-specific issues prevent all of the above conditions from being met, a SOP approved by Public Works Environmental Services is required to be adopted and posted at the site.

200.5 TRAINING

200.5.1 GENERAL TRAINING

The following personnel must receive stormwater training biennially (every two years):

- Field personnel
- Personnel responsible for road, street, and parking lot maintenance
- Personnel working in and around recreation, public works, and maintenance facilities
- County plan reviewers, inspectors, emergency response employees, and construction site operators
- Any additional personnel deemed necessary by the permit

Training must include, at a minimum: MS4 requirements, recognition and reporting of illicit discharges, and good housekeeping and pollution prevention practices.

200.5.2 PESTICIDE AND HERBICIDE APPLICATION TRAINING

Employees and contractors who apply pesticides and herbicides must be properly trained or certified per the Virginia Pesticide Control Act (§3.2-3900 et seq. of the Code of Virginia).

200.5.3 EROSION AND SEDIMENT CONTROL TRAINING

County plan reviewers, inspectors, program administrators, and construction site operators must be trained and obtain appropriate certifications as required under Virginia Erosion and Sediment Control Law and attendant regulations.

200.5.4 SPILL RESPONSE TRAINING

All County personnel with responsibilities for complying with a facility's Spill Prevention Control and Countermeasure Plan (SPCC) must receive annual spill response training.

All Department of Fire & Rescue uniformed personnel must be trained to the level of Hazardous Materials First Responder Operations as required by OSHA standards (29 CFR 1910.120(q)(6)(ii). Annual refresher training is required and must, at a minimum, meet requirements of OSHA Standards (29 CFR 1910.120(q)(8)(ii).

The Department of Fire and Rescue's Hazardous Materials Response Team must consist of at least 10% of the Uniform personnel that are trained to the Hazardous Materials Technician

Level (29 CFR 1910.120(q)(6)(iiI). Annual refresher training is required and must meet the requirements of OSHA Standards (29 CFR 1910.120(q)(8)(ii).

200.6 NOTIFICATION OF SPILLS AND/OR ILLICIT DISCHARGES

If an illicit discharge is observed or created, departments are responsible for immediately reporting the incident to PWC Hazardous Material Personnel by calling 911 or non-emergency number at (703) 792-6700. Details such as location of the incident and description of the discharge should be conveyed. Secondary notification should be made to Environmental Services and Risk Management via the Spill Report Form located on the Risk Management intranet home page.

200.7 RECORD KEEPING/ ANNUAL REPORTING

Public Works Environmental Services will notify all impacted departments of annual reporting requirements in the first quarter of each fiscal year. Within the first 30 days following the close of that fiscal year, Departments will provide Environmental Services all required data, reports, and other deliverables assigned to them at the start of the year. Should a new or revised requirement be imposed, Environmental Services will notify impacted departments within 30 days.

200.8 SWPPP

Facilities that have been identified as high priority through the MS4 permitting process will be notified by Environmental Services and required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Departments are responsible for complying with all SWPPP requirements including good housekeeping, record keeping, training, and inspections.

200.9 OVERSIGHT

Risk Management and Environmental Services will audit records and inspect facilities for compliance with the MS4 permit on an annual basis. Results of audits and inspections will be reported to department management and executive management.

Appendix J – Public Education/Participation

More Best Management Practices . . .

- **Pet care**

  Pet waste washes from yards and paved areas. It is a major source of bacteria and excessive nutrients in local waters. Pet wastes can contribute up to 50% of the total bacteria in a stream. **Please pick up and flush pet wastes down the toilet or place pet wastes in the trash**

- **Car maintenance**

  Ensure your car is not leaking oil or fluids

  Visit repair shops that properly dispose of oils and wastes

  Properly dispose of used oil and batteries, learn more at:
  www.pwcgov.org/trashandrecycling

- **Septic system maintenance**

  A leaking septic system can release nutrients and pathogens into near by waters. Inspect and pump your septic system every five years

- **Household hazardous waste disposal**

  Properly dispose of items in designated locations, and never flush HHW down the drain or toilet. For more information visit:
  www.pwcgov.org/trashandrecycling

- **Manage your lawn and landscape**

  Use fertilizers and pesticides sparingly and not within15 to 20 feet of a stream). For more information on management plans:
  http://www.ext.vt.edu/

  Don't allow grass clippings and leaves to enter the storm drain since this can add nutrients and organic matter to streams

  Sweep excess fertilizer and pesticides off of impervious surfaces and onto lawn

  Landscape with low maintenance and native plants — and grow less turf

Leave grass height between 3" and no higher than 12"

Install practices such as rain barrels, permeable pavement, rain gardens and vegetated filter strips that have less impact

Resources and who to call

Solid Waste Division at 703-792-4670

- Recycle motor oil, anti-freeze and car batteries
- Household Hazardous Wastes
- Electronics Recycling
- Yard Waste Composting

Virginia Cooperative Extension at 703-792-6285

- Nutrient Management Planning

Environmental Health Department at 703-792-6310

- Well and Septic Maintenance

Fire & Rescue at 703-792-6360 or after hours public safety communications at 703-792-6500

- Hazardous Waste Spills
- Emergency situations — call **9-1-1**

Keep Prince William Beautiful at 571-285-3772

- Litter Control, Prevention and Clean Ups
- Heavily littered areas in a specific spot

Prince William County

Department of Public Works
Watershed Management
5 County Complex Court, Suite 170
Prince William, VA 22192
703-792-7070
illicitdischarge@pwcgov.org
www.pwcgov.org/publicworks

Prince William County

Help Stop Pollutants from Entering Our Streams

Illicit Discharge Detection and Elimination Program

Protecting the health, safety and welfare of the public, environment, and infrastructure by controlling pollution entering our local waterways and the Chesapeake Bay.

About Storm Water Runoff

Storm water runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent storm water runoff from naturally soaking into the ground. Storm water can pick up debris, chemicals, dirt, and other pollutants then flow untreated directly into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. These liquids and contaminates can impact the water quality of local streams, creeks, rivers, the Chesapeake Bay and beyond!

Storm water pollution and runoff can:

- Destroy wildlife and kill fish and shellfish
- Cause human illness
- Limit recreational activities, swimming conditions, and even close beaches
- Erode and destroy stream channels

What is Illicit Discharge

Any fluid or material substance that is disposed, emptied or dumped into the storm water system that is not rain water. Prince William County holds a permit to help monitor and control any **non-storm water** from entering the local municipal separate storm sewer system. This permit helps preserve local water quality.

What is not an Illicit Discharge

- Discharges from drinking water sources, springs, and groundwater
- Air conditioning condensation and foundation drains
- Watering lawns and landscaping
- Individual car washing at a residence
- Discharges from firefighting activities
- Swimming pool water that has had chlorine and other chemicals removed

Local efforts to control Illicit Discharge

Through a permit from the Virginia Department of Environmental Quality and the Environmental Protection Agency, the County has the legal responsibility to control discharges and impose fines on anyone who knowingly allows or causes pollutants to enter the storm sewer system. The program requires us to:

- Inventory and monitor storm water outfalls
- Eliminate illicit discharges and improper disposal
- Educate the public and raise awareness
- Inspect industrial and commercial storm water permits to ensure compliance

For your safety!

Please stay clear of any suspected illicit discharge or polluted flow of material. Do not come in contact with it or try to clean it up. Please call 703-792-7070 to report the problem. Trained personnel will respond, inspect, identify and then take steps to clean it up.

If you feel the situation is critical or poses a threat to the safety of people in the area, please call 9-1-1.

What can you do to help?

Report Illicit Discharges

Report any suspicious dumping directly into storm drain inlets

Signs of dumping are most readily observed during dry weather situations (more than 48 hours since a rain event):

- Oil sheen/grease entering or exiting storm drains
- Detergents (odd colors)
- Sediment (red/orange), cloudiness
- Chemicals and paint

What to report:

- Time and date, name, and phone number
- Description of spill (color, odor, amount, etc.), location, does it discharge into waterway
- Any information describing the source of the spill

How to report

- **Call 703-792-7070**
- **Send an email: illicitdischarge@pwcgov.org**

Use Best Management Practices

- **Car washes**

  Wash your car at a commercial car wash since they must treat the wastewater

  OR

  Use phosphate free soaps/detergents and wash on a grassy area so that wash water is filtered through the soil

OFFICIAL FILE COPY

COUNTY OF PRINCE WILLIAM

5 County Complex Court, Suite 170
Prince William, Virginia 22192-5308
(703) 792-7070 Metro 631-1703 FAX: (703) 792-6297

DEPARTMENT OF
PUBLIC WORKS

Thomas Bruun
Director

April 18, 2017

The Right Choice Carpet and Flooring Services
10471 Manns Harbor Court
Gainesville, VA 20155

Dear Sir or Madam:

Prince William County is committed to protecting water quality. As part of our public education, we are reaching out to the many mobile cleaning services that operate in Prince William County. We are reminding these businesses that discharging wastewater, detergents, or any other fluids generated by their cleaning activities, into the stormwater system or streams, is prohibited by Prince William County Code Section 23.2-4.1 "Unlawful discharge to the stormwater system and water of the County". The violation of County Code may lead to cumulative civil penalties.

We appreciate your efforts in helping Prince William County keep our water clean by disposing of any material generated by your business in an industry standard method.

Should you have any questions or concerns, please feel free to contact Environmental Engineer Mr. David Ungar at (703)792-7104 or email at DUngar@pwcgov.org

Sincerely,

Madan Mohan, Branch Chief
Watershed Management Branch

MRM/PP/lyc/Carpet Cleaners Awareness ltr.docx

Carpet Cleaners

This fact sheet identifies Best Management Practices (BMPs) that are recommended for carpet cleaners. These BMPs have been developed to assist mobile carpet cleaning businesses that transport equipment and provide services in multiple regions. The mobile nature of these businesses creates challenges in how materials and waste handling are managed.

POTENTIAL POLLUTANT SOURCES

The following activities are potential sources of pollutants:

- Improper disposal of wash water
- Chemical spills
- Leaking equipment or hoses

Pollutants may include:

- Sediment
- Debris
- Toxic chemicals (solvents, surfactants)

POLLUTION PREVENTION

Using pollution prevention measures to reduce pollutants at the source may reduce or eliminate the need for other, more costly or complicated procedures. The following pollution prevention principles apply to most carpet cleaners:

- Properly dispose of wash water (see "Waste Handling" below).
- Minimize use of chemical cleaners. Use alternative, safer, and/or non-toxic chemical cleaners.
- Identify and plan around potential spills. Have equipment, material, and personnel available to handle a spill or discharge.
- Immediately and appropriately clean up any spill on impervious surfaces (e.g., roads, driveways).
- Regularly inspect and maintain equipment.
- Provide ongoing employee training.

BEST MANAGEMENT PRACTICES AND PROCEDURES

Prior to Carpet Cleaning

- ► Identify stormwater entry points at the job site and provide containment (i.e., protect with berms) to ensure wash water cannot flow into them if spilled.
- ► Pre-inspect equipment for leaks or the potential for leaks (i.e., cracks). Ensure that equipment is working correctly.
- ► Locate the sanitary sewer cleanout on the homeowner's property where wash water and spent cleaning fluid will be discharged.
- ► Tightly cap chemical containers before and immediately after use.

ARTICLE II. STORMWATER POLLUTION

Sec. 23.2-4.1. Unlawful discharge to the stormwater system and waters of the county

(a) It shall be a violation of this article for any person to discharge:

(1) Any wastes, trash, garbage, or any matter causing or aiding pollution on any property in the County in any manner so as to allow such to be washed into any stormwater system by storm or floodwater.

(2) Any grass clippings, mulch, or yard waste, animal carcasses and other wastes into the stormwater system, or do any injury to the stormwater system or in any manner pollute the stormwater system.

(3) Any discharge of gasoline, oil waste, antifreeze, or other automotive, motor or equipment fluids into the stormwater system.

(4) Any commercial, industrial, or manufacturing entity to discharge process water, wash water, or unpermitted discharge into any stormwater system.

(5) Any person to throw, place, or deposit, or cause to be thrown, placed or deposited, in any gutter, ditch, storm drain or other drainage area in the county, anything that impedes or interferes with the free flow of stormwater therein.

(6) Chlorinated swimming pool water without dissipating chlorine.

(b) Subject to the provisions of subsection (c) below, the following activities shall not be unlawful discharges:

(1) Discharges pursuant to a VPDES or NPDES permit;

(2) Discharges resulting from fire fighting activities;

(3) Water line flushing;

(4) Landscape irrigation;

(5) Diverted stream flows or rising groundwater;

(6) Infiltration of uncontaminated groundwater;

(7) Pumping of uncontaminated groundwater;

(8) Discharges from potable water sources, foundation drains, irrigation water, springs, water from crawl spaces or footing drains;

(9) Air conditioning condensation;

(10) Lawn watering;

(11) Residential car washing;

(12) Dechlorinated swimming pool discharges; and

(13) Public street washing.

(Ord. 03-87, 9-16-03)

Sec. 23.2-4.2. Inspecting and monitoring stormwater discharge.

The director shall have the authority to inspect and monitor discharges and sources of potential discharge to the storm sewer system to ensure compliance with this article, including the authority to enter upon private property to inspect or monitor such discharges or sources of potential discharge. The director shall also have the authority to initiate enforcement actions in accordance with section 23.2-4.3.

(Ord. 03-87, 9-16-03)

Sec. 23.2-4.3. Notice to correct violations.

If any activity listed in subsection 23.2-4.1(b) of this chapter is found by the director to be a source of pollutants to waters of the United States, the director shall serve a written notice on the party responsible for the activity which orders that the activity be ceased or conducted in a manner that will avoid the discharge of pollutants to the stormwater system. The notice shall state the date by which the activity shall cease or be conducted without pollution. Failure to comply with any such order within the time stated in the notice shall constitute a violation.

For any violations of this chapter, the owner must comply with the director's orders within the time specified in the notice. Failure to comply with such order shall constitute a violation of this chapter. In addition to any penalty imposed for each violation, a judge hearing the case may direct the person responsible to remediate or correct, and each day's default in such remediation or correction shall constitute a violation of and a separate offense under this section.

(Ord. 03-87, 9-16-03)

Sec. 23.2-4.4. Penalties for violations of article.

(a) Any person who knowingly violates any provision of this article shall be guilty of a Class 1 misdemeanor. Each day that such violation is committed, and each day that such violation is permitted to remain uncorrected shall constitute a separate offense.

(b) Any person who otherwise violates any provision of this article shall be subject to civil penalty between $250.00 and $1,000.00 for each day that the violation continues. The court assessing such civil penalty may order the penalty to be paid into the treasury of the county and designated for the purpose of minimizing, preventing, managing or mitigating pollution of the waters of the county.

(c) Any person who violates any provision of this article shall be responsible for testing, containing cleaning up, abating, removing and disposing of any substance unlawfully discharged into the storm sewer system or into waters of the county, or, if the director determines that correction of the violation can best be accomplished by the county, shall be liable to the county for all costs of testing, containment, cleanup, abatement, removal and disposal of any substance unlawfully discharged into the storm sewer system or into waters of the county.

(Ord. 03-87, 9-16-03)

S.NO	Carpet Cleaning Company	Address	Phone
1	Shiny Carpet Cleaning	5654 Independent Circle Alexandria, VA 22312	202-715-9394
2	Bright Bubbles	10058 Portsmouth Road Manassas, VA 20109	(866) 509-6179
3	Elizabeth Cleaning Services	8660 Carlton Drive Manassa, VA 20110	(866) 423-9481
4	Clean-O-Logy, Inc.	9108 Church Street, #344 Manassas, VA 20112	(855) 253-2625
5	Mighty Clean Carpet Care	9040 Jerrys Circle Manassas, VA 20110	(703) 373-7444
6	Steven's Chem-Dry	8487 Euclid Avenue, Suite 7 Manassas, VA 20110	(571) 229-0623
7	GJ Painting and Cleaning Services, LLC	8621 Braxted Lane Manassas, VA 20110	(571) 535-1907
8	Walker's Carpet Care and Janitorial Service, Inc.	9046 Euclid Avenue Manassas, VA 20110	703-368-4959
9	Hector Carpet Cleaning, LLC	10321 Trundle Place Manassas, VA 20109	(703) 314-6992
10	Izzy Cleaning Services	2701 Park Center Drive, #B308 Alexandria, VA 22302	(571) 244-0210
11	Nelly's Services	14188 Hunters Run Way Gainesville, VA 20155	(703) 656-1336
12	Condezos Carpet Cleaners The King Elvis, Inc.	3436 Tuckahoe Court Dumfries, VA 22026	(703) 587-6943
13	MW Cleaning Solutions, LLC	275 Kirby Street Manassas Park, VA 20111	(301) 960-0720
14	Neighborhood Carpet Cleaners	16800 Jed Forest Lane Woodbridge, VA 22191	(703) 570-6616
15	Sol Carpet Care	1045 South Main Street, Unit A2 Woodstock, VA 22191	(703) 568-0562
16	Excellent Carpet Cleaning Service	1604 Spring Hill Road, Suite 320 B Vienna , VA 22182	(703) 901-1995 (202) 730-1143
17	Service Matters Services	2800 Dorr Avenue Fairfax, VA 22031	(703) 272-4707

18	Fresh & Clean, LLC	3315 Tony Court Dumfries, VA 22026	(571) 242-0213
19	ZAF Cleanings, LLC	5601 Seminary Road, Suite #12N Falls Church, VA 22041	(202) 417-1437
20	Mark's Quality Carpet Cleaning, LLC	7924 Harwood Place Springfield, VA 22152	(571) 214-2495
21	Ana's Housecleaning Services	1505 Colchester Road Woodbridge, VA 22191	703-615-4723
22	SM Design Floors, Inc.	5437 Mapledale Plaza Dale City, VA 22193	703-675-6576
23	PowerDry Carpet Cleaning	282 North Cottage Road Sterling, VA 20164	(703) 430-0111
24	El-Mi Carpet Cleaning Service	7308 Old Carolina RoadGainsville, VA 20155	(571) 284-8063
25	The Right Choice Carpet and Flooring Services	10471 Manns Harbor Court Gainesville, VA 20155	(703) 473-4666
26	Better Cleaning Solutions, LLC	1774 Proffit Road Vienna, VA 22182	(443) 200-7207
27	C&T Janitorial Services, Inc.	5208 Aetna Springs Road Woodbridge, VA 22193	(202) 715-9453
28	Real Cleaning Concierge, LLC	15231 Colony Place, Suite 315 Woodbridge, VA 22191	(703) 357-7360
29	All In 1 Handyman, LLC	15222 Jeans Court Woodbridge, VA 22193	(240) 382-7116
30	OMA Professional Cleaning Technicians, LLC	7012 Wren Lane Lanham, MD 20706	(240) 755-2420
31	Bermon Carpet Cleaning	770 North Wakefield Street Arlington, VA 22203	703-675-3346
32	Apple Cleaning Carpet Services	905 Anival Drive Warrenton, VA 22405	(540) 361-8818

33	Superior Fabric Cleaners	2 Bells Ridge Drive Stafford, VA 22554	(703) 340-2157
34	Capital Restoration	2621 Morse Lane Woodbridge, VA 22192	(703) 595-2996
35	Ayoub Carpet Service	3856 Dulles South Ct, Chantilly, VA 20151	(703) 665-1675 info@RugCare.com
36	Sears Carpet and Air Duct Cleaning	8200 Sudley Rd Manassas, VA 20109	703-367-7000
37	Sears Carpet and Air Duct Cleaning	2700 Potomac Mills Circle Prince William, VA 22192	(703) 490-3968
38	Chem-Dry of Prince William	12503 MAIDEN CREEK COURT BRISTOW, VA 20136	(571) 989-6935
39	We Clean Carpet		703-682-0006
40	Oxi Fresh Carpet Cleaning	Gainesville, VA	703-743-3050
41	Shiny Carpet Cleaning	1053B west Broad Street Falls Church VA 22046	703-975-9099 info@shinycarpetcleaning.com
42	Lustre Clean Carpet Service	25050 Riding Plz Suite 130 642 South Riding, VA 20152	(571) 234-8395
43	Clean As Snow Carpet & House Cleaning	25084 Magnetite Ter Aldie, VA 20105	(703) 429-1531
44	Stanley Steemer	5611 Wellington Rd Gainesville, VA 20155	(800) 783-3637
45	Cascade Services	7371 Atlas Walk Way #149 Gainesville, Virginia 20155	(703) 915-2402 info@cascademe.com
46	JCB Carpet & Upholstery Cleaning, Inc.		(703) 595-4083 info@jcbcarpetcleaning.com
47	Remarkable Difference	5931 Tumble Creek Ct Haymarket, VA 20169	(703) 753-2722 remarkabledifferencecarpet.com
48	Red Carpet Cleaning	4409 Elan Ct Annandale, VA 22003	(571) 445-2459 redcarpet4cleaning.com
49	American Pride Restoration	Gainesville VA 20155	(571) 477-5976
50	Aly's Cleaning Services	7672 Chadds Landing Way Manassas, VA 20111	(571) 288-6526 novahousecleaning.com
51	Pristine Services		(571) 330-0512 pristinecleanva.com
52	Piedmont Carpet & Upholstery Care	5602 Mendelmore Way Haymarket, VA 20196	

Additional outreach events undertaken in FY17.

Prince William County Public Works has implemented several sustainability practices and conservation programs to enrich our community.

Sustainability Practices

Environmental Management System within Prince William County

- Manage and monitor actions to reduce government agencies impact on environment
- Focus on global issues (tanks, chemicals and storm water management) at County level
- Ensure County staff understand GHS and have access to online SDS for employee safety
- Implement improved practices, training and reviews at department and division level based on their unique setting or operations
- Enhance awareness of all employees so they can recommend improvements and enhancements to their operations
- Form an Environmental Management System Council to support the government efforts and provide leadership

Smarter Chemical Council within Prince William County

- Seek and review chemicals that are safer for staff and secondarily safer for the environment
- Review practices to also look for safer solutions for staff
- Goals include creation of a preferred chemical list and proper disposal of chemicals
    - Simplifies management and emergency response
    - Realize savings by buying in bulk from same vendor
- Ensure safe handling of harsher chemicals that must be used

Sustainability Partners within Prince William County

- Volunteer program for government agencies to take steps to reduce their waste, increase recycling and conserve energy
- Focus on providing training for County employees on Environmental Topics including illicit discharge, spill prevention and watersheds

Environmental Reviews and Awareness Training for Prince William County Staff

- Created short video presentations on spill prevention, illicit discharge and watersheds for all County staff to watch on Intranet
- Created a challenge and prizes to encourage staff to watch the videos
- Reviewed illicit discharge and stormwater management practices at County facilities with operations that could create pollution issues then determined

improvements in operations if deemed necessary to comply with new IDDE policy

Action Steps taken by Prince William County

- Amend County's Comprehensive Plan to reflect a sustainable approach to future development and zoning
- Adopt an Environmental Policy Statement
- Adopt an Illicit Discharge Detection and Elimination Policy
- Host quarterly meetings of the County Government's Green Guiding Committee that explores and addresses environmental topics including energy, fuel, recycling, waste reduction, green buildings, green procurement and water quality.
- Establish an aggressive citation and prosecution program to handle illicit discharge violations with enforcement by the fire marshal's office.
- Place and monitor spill kits at County facilities at high risk areas where spills could enter waterways, plus enforce spill reporting procedures
- Create protocol for staff and volunteers for found tanks, suspicious bottles/jars and oil/fluid spills during inspections and cleanups
- Establish protocol for properly washing and fueling County vehicles and equipment
- Enforce protocol for outdoor storage of equipment, materials, and chemicals
- Enforce protocol for deicing operations at County facilities and
- Offer tax credit for open space on agricultural and forested reserve lands
- Support water monitoring programs conducted by Occoquan Laboratories and studies on Bacteria Source Tracking tests through Virginia Tech
- Establish a protocol for monitoring, inspecting and replacing Above Ground Storage Tanks as needed to reduce spills and runoff
- Establish proper collection and disposal of batteries, universal waste, printer cartridges and other electronic accessories, chemicals and hazardous wastes in County government and Service Authority (water and sewer)
- Service Authority collects hazardous waste, stores in drums and dispose of waste through contractor to ensure waste does not compromise environment
- Provide regular training on spill prevention and response, universal waste management, RCRA, Environmental Management Systems, illicit discharge prevention, hazardous communications, and outdoor hazards
- Conduct regular inspections of refuse hauling equipment to reduce incidents of spills and leaks from trucks, as well as trash blowing from trucks to prevent the debris from entering local waterways

Conservation Programs

Water Quality Monitoring sponsored by Prince William Soil & Water Conservation District

- Conduct water quality testing with volunteers under the supervision of trained leaders
- Monitor for floatables in the streams
- Clean trash from the streams (cleaned 29,217 pounds in 2017)
- Share test results and observations with County personnel for follow up action or orchestrated clean-ups

Agricultural Best Management Practices guided by Prince William Soil & Water Conservation District

- Achieve Nutrient Reduction from BMPs and Planning at Agricultural Operations
- Implement Soil and Water Conservation Plans and Technical Assistance at Agricultural Operations
- Provide Technical Assistance to Landowners
- Completed a series of workshops and field studies on best management practices for horse owners

Residential Best Management Practices

- Provide Watershed Education to adults (Soil & Water Conservation District)
- Offer Virginia Conservation Assistance Program to local residents to address urban erosion issues (Soil & Water Conservation District)
- Conduct training on Best Lawn Programs to demonstrate responsible use of fertilizers and herbicides (Virginia Cooperative Extension)
- Provide guidance on alternative lawns rather than just turf (Virginia Cooperative Extension)
- Continue with a robust Master Gardner training and community engagement effort to help instill sound and wise landscaping practices (Virginia Cooperative Extension)
- Offer a wide range of community education topics on landscaping, gardening and best practices to help residents reduce their chemical use (Virginia Cooperative Extension)

Stream Restoration, Stabilization and Improvements

- Infrastructure / sanitary sewer protection,
- Aquatic Habitat Improvement
- FEMA floodplain protection and enhancement,
- Meet TMDL goals
- Reconnect the stream to its floodplain
- Riparian corridor replanting
- Prevention of private property losses.
- water quality benefits
- Habitat improvements

Pollution Prevention

- Created a nutrient management plan for their treatment plant sites that prescribes the amount of fertilizer to use at sites to reduce the amount of nitrogen and phosphorous that could run into creeks (Service Authority
- Require treatment of wastewater generated by commercial and industrial facilities to remove harmful pollutants before discharge into a sewer system (Service Authority)
- Implement an education program about Fats, Oil and Grease (FOG) to reduce the amount of fats, oils and grease that enters sewer from commercial food service establishments – the fats, oils and grease cling to sewer pipes that can cause backups and overflows (Service Authority)
- Establish a Stormwater Pollution Prevention Plan (SWPPP) at the County Landfill to control potential runoff and pollutants at this high risk facility
- Explore and establish a SWPPP at additional sites that may have a high risk of discharging pollutants

Habitat Projects

- Serve as caregiver for the Julie J. Metz Neabsco Creek Wetlands Preserve (Public Works)
- Tend a number of school gardens and wildlife habitats around community (Virginia Cooperative Extension)
- Establish meadows and natural habitats (Public Works, Historic Preservation)
- Create space for bee hives (Public Works, Historic Preservation)
- Relocate bees to healthier environments so they can thrive (Public Works, Historic Preservation and local beekeepers)
- Plan and install a pollinator garden, bee hive setting and bee hotel setting at the County Landfill (Public Works, KPWB, Bees and Schools, Conservation Alliance, GMU)
- Create hay operation at Bristoe Station Battlefield to produce crop food for livestock and reduce mowing costs (Public Works, Historic Preservation)
- Reduces need to mow, water and fertilize (all)

Native Plant

- Created a webpage on the value of native plants with links to local resources and experts (Public Works)
- Host garden tours and special lectures (Prince William Wildflower Society)
- Install a pollinator garden at a rest area along I-95 (Prince William Wildflower Society)

Reforestation Projects

- Commit to a practice to preserve natural tree stands, retain top soil and reforest or create meadows at new County projects rather than creating turf/lawn – this saves costs in mowing, fertilizing/pest control and maintenance, plus restores the natural appearance and function of the area (Public Works)
- In the past 10 years, the County has undertaken 15 reforestation projects and planted 48 acres with 24,000 trees (Public Works)
- Reduces the need to mow, which saves the County money and reduces use of gas-powered equipment
- Reduces the need to water and fertilize
- Serves as excellent erosion control and buffer
- Recreate areas to how the originally stood, which helps with community identity and historic interpretation (Public Works, Historic Preservation)

Conservation Projects

- Since 2010, families with students that participated in the Youth Ambassadors' Conference on the Environment have assisted with a wide array of conservation projects (Public Works)
- These projects have included: (Public Works)
    - Trail improvements
    - Stream improvements
    - Litter pick up
    - Tree planting
    - Meadow and garden planting
    - Recycling improvements (including a paper collection box at the Animal Shelter)
    - Bird box installation
    - Habitat creation
    - Slope stabilization
- Organize Litter Clean Ups throughout the community (Keep Prince William Beautiful)
- Place labels on storm drains advising citizens that the drain leads to local waterways and the bay (Keep Prince William Beautiful)

Community Enrichment

Education

- Since 2001, hosted an annual Youth Ambassadors' Conference on the Environment to share local environment topics with 4th to 8th grade students (Public Works)
- Since 2002, offered high schools students to take the lead and guide younger students on a variety of topics and activities as part of the Youth Ambassadors' Conference on the Environment (Public Works)

- Since 2010, offer a special symposium for parents during the Youth Ambassadors' Conference on the Environment to share information on the same topic as covered for the students (Public Works)
- Create a preschool with an environmental focus and curriculum – make it even better by repurposing an old library to house the preschool (Prince William Department of Parks and Recreation)
- Offer summer camps with an environmental focus and curriculum (Prince William Department of Parks and Recreation)
- For the past 26 years, provide an opportunity for 4th graders to learn about the crops, trees, soil, agricultural practices, bees, erosion, regions of Virginia and farm animals (Prince William Soil & Water Conservation District with support from Public Works)
- For the past 15 years, the County has celebrated its recycling success with the popular Prince William Recycles Day Event at the County Landfill with landfill tours, entertainment and lots of information (Public Works)
- For the past five years, the County has participated in Compost Awareness Day with displays, guest speakers and activities at the County's compost facility (Public Works)
- Coordinate networking and knowledge sharing by local government, state government and non-profit organizations involved with environmental volunteer, education and services (Public Works)
- Provide outdoor lab studies for sixth grade students to learn about animals, habitats and ecosystems (Prince William County Schools)
- Provide outdoor and indoor lab studies for fourth grade students to learn about watersheds (Prince William County Schools)
- Provide a meaningful field experience for third grade students to learn about watersheds, soils and ecosystems at a local working farm (Prince William Soil & Water Conservation District)
- Offer environmental and cultural resource programs at the Julie J. Metz Neabsco Creek Wetlands Preserve (Public Works)
- Host an Earth Day Festival for County Employees with information on recycling, water quality, pollution prevention, pest management, gardening and an assortment of other topics (Public Works)
- Provide education on water quality topics to over 4,000 students (Prince William County Service Authority)
- Host a five session Water Academy for 30 citizens to raise awareness on efforts to provide clean drinking water (Prince William County Service Authority)
- Create a special page on eliminating illicit discharge for Carpet Cleaning Companies (Public Works)
- Creating a special page on eliminating illicit discharge for landscapers in Fall 2017 (Public Works)

- Planning a second workshop on the economic benefits of sustainability and going green for the community (Keep Prince William Beautiful)

Enhanced services to citizens from Public Works

- Collect household hazardous waste and electronics twice a week to provide residents with a viable disposal option and reduce occurrence of materials disposed down storm drains
- Implementing an improved system using new aerating bunkers and an anaerobic digest at the County's compost facility so that we can handle up to 40,000 tons of organic waste each year
- Provide opportunities for citizens to drop off paper for shredding in a secured manner twice a year since 2011
- Monitor and manage mosquitoes to eliminate health concerns and nuisance
- Monitor and manage forest pests such as gypsy moth, emerald ash borers and thousand cankerworms to reduce impact on local trees
- Capture Landfill gas to generate enough energy to power 5,000 homes in the community and to reduce potential pollution from the gas
- Pick up litter daily along highly traveled and visible roads, as well as clean dump sites throughout the community
- Enforce property code requirements to eliminate dump heaps, overgrown grass and unkempt structures on residential and commercial properties

Appendix K - Training

IDDE Stormwater Training

Outline

- Introduction, Purpose
- What is an Illicit Discharge
- How to Identify Illicit Discharges
- What to do when an Illicit Discharge Is Identified

Introduction

- The Municipal Separate Stormsewer System, or MS-4, is a series of inlets, pipes, and outfalls that convey stormwater from impervious services and low lying areas to streams and rivers.

- The County's authority to discharge water from its MS-4 into surface waters is governed through its MS-4 permit. Which outlines steps the County must take to ensure the quality of this water is clean to the greatest amount practicable.

What is an Illicit Discharge

- An Illicit Discharge is any non-stormwater discharge to the stormsewer system

- County Ordinance dictates that it shall be a violation to discharge any non-stormwater type substance into the MS-4. Although there are some exceptions (firefighting activity, landscape irrigation, residential car washing, potable water discharges).

- County Staff relies on citizen/employee reporting, and dry weather screening of outfalls to detect Illicit Discharges.

How to Identify Illicit Discharges

- Commonly Found Illicit Discharges

Oil and/or Fuels

- Color: Rainbow sheen floating on top of water surface
- When disturbed, sheen will swirl together
- Odor: May have strong petroleum or gasoline smell
- Turbidity and Floatables: Oil sheen, red, brown, black streaks

Grease

- **Color: Yellow, Golden, Brown**
- **Odor: Stale greasy smell, petroleum, cooking grease**
- **Turbidity and Floatables: Material typically clumps/strings together, will most likely have other material floating within**

How to Identify Illicit Discharges

Sediment

- **Color: Orange, Yellow, Red, chocolate milk**
- **Odor: None**
- **Turbidity and Floatables: Typically find deposits settled to bottom, water can be very turbid, may not be able to see bottom of stream**

Sewage

- **Color: Grey**
- **Odor: Strong sewage smell, Sulfur, Fecal matter**
- **Turbidity and Floatables: Foam, Bubbles, fecal solids, food wastes, toilet paper, etc.**

How to Identify Illicit Discharges

Soaps and Detergents

- **Color: Milky White, Grey, Cloudy**
- **Odor: Fragrance like laundry detergent/soaps, or none at all**
- **Turbidity and Floatables: Bubbles, foam, highly turbid**

Cement, Construction runoff

- **Color: Grey, cloudy, milky, muddy**
- **Odor: None**
- **Turbidity and Floatables: Unlike soaps and detergents, runoff from these activities should be void of floatables such as bubbles and foam, high turbidity and sediment should be present.**

Dyes

- **Color: Bright Green, blue, pink, etc.**
- **Odor: None**
- **Turbidity and Floatables: Bright Color, used in testing of sewer and stormsewer system, should look very unnatural**

How to Identify Illicit Discharges

- What Is not an Illicit Discharge

Algae

- Color: Green, brown
- Texture: Fibrous, slimy, hairy
- Odor: Musty, biological smell.
- Turbidity and Floatables:
- Typical Timeframe of Occurrence: Late spring into early fall, often found in low flow

Bacteria

- Color: Red, Rust color
- Texture: Clumpy, thick layer on surface of water
- Odor: None
- Turbidity and Floatables: Rainbow Sheen, clumpy red deposits, when disturbed rainbow sheen "shatters" instead of swirling like oil deposits
- Typical Timeframe of Occurrence: Early summer through early fall

How to Identify Illicit Discharges

Tannins

- Color: brownish red, tea color
- Odor: none
- Turbidity and Floatables: leafy matter
- Typical Timeframe of Occurrence: Fall

Pollen

- Color: Yellow
- Odor: none
- Turbidity and Floatables: dust/film
- Typical Timeframe of Occurrence: Late winter through spring into early summer, typically seen on stagnant water

What to do when an Illicit Discharge is Identified

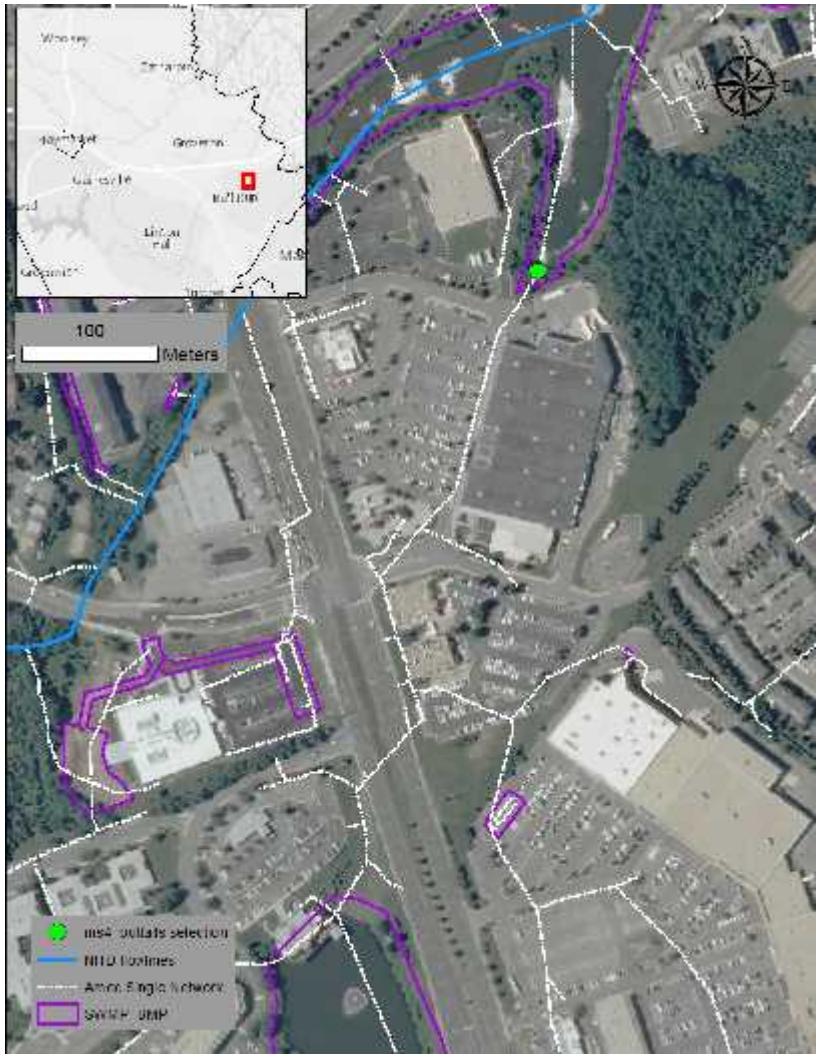
Discharges can be observed both entering and exiting the stormsewer system.

- For large discharges of petroleum of fuel products, or spills with the potential to create immediate harm to people or property, contact emergency services at by dialing 911.

- For all other discharges, contact Prince William County Watershed Management at (703)792-4797 or by email at Illicitdischarge@pwcgov.org.

Appendix L – Water Quality Programs

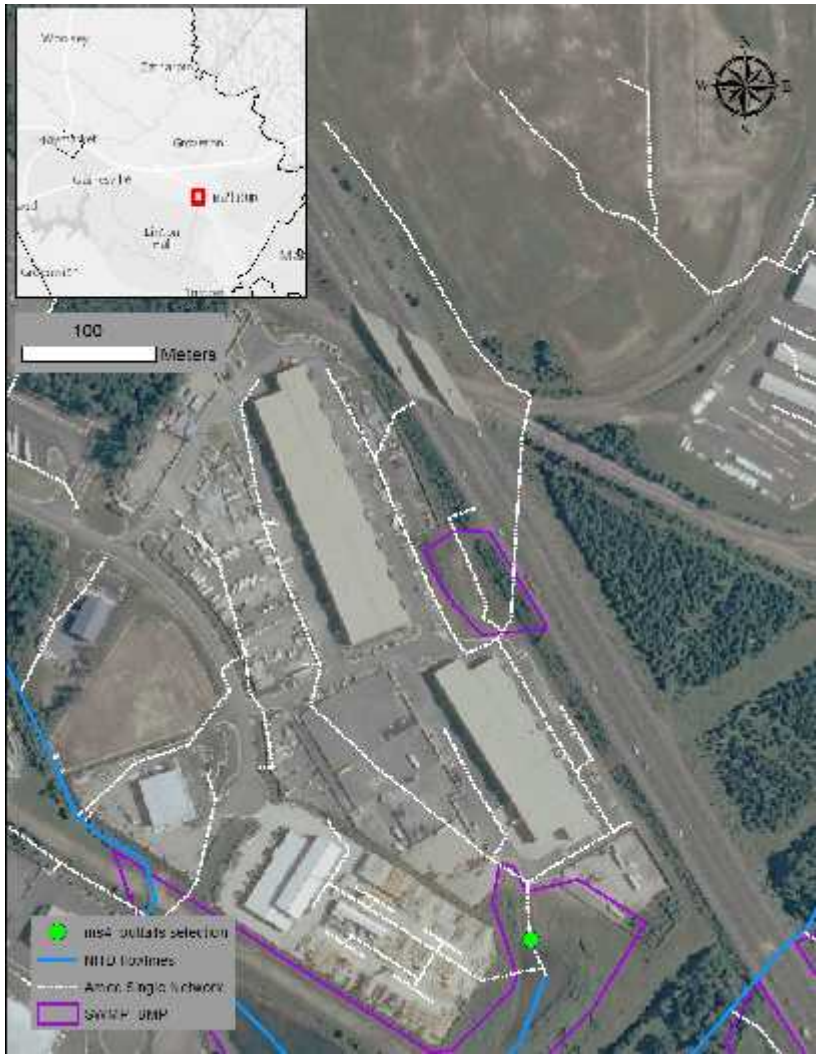
#684: Bull Run, Lowes Parking Lot



- **84” x 54” box culvert**
- **Contribution from upstream BMP**
- **~1” flow during storm (7/18)**
- **Low visibility, steep slopes**

Access: Difficult

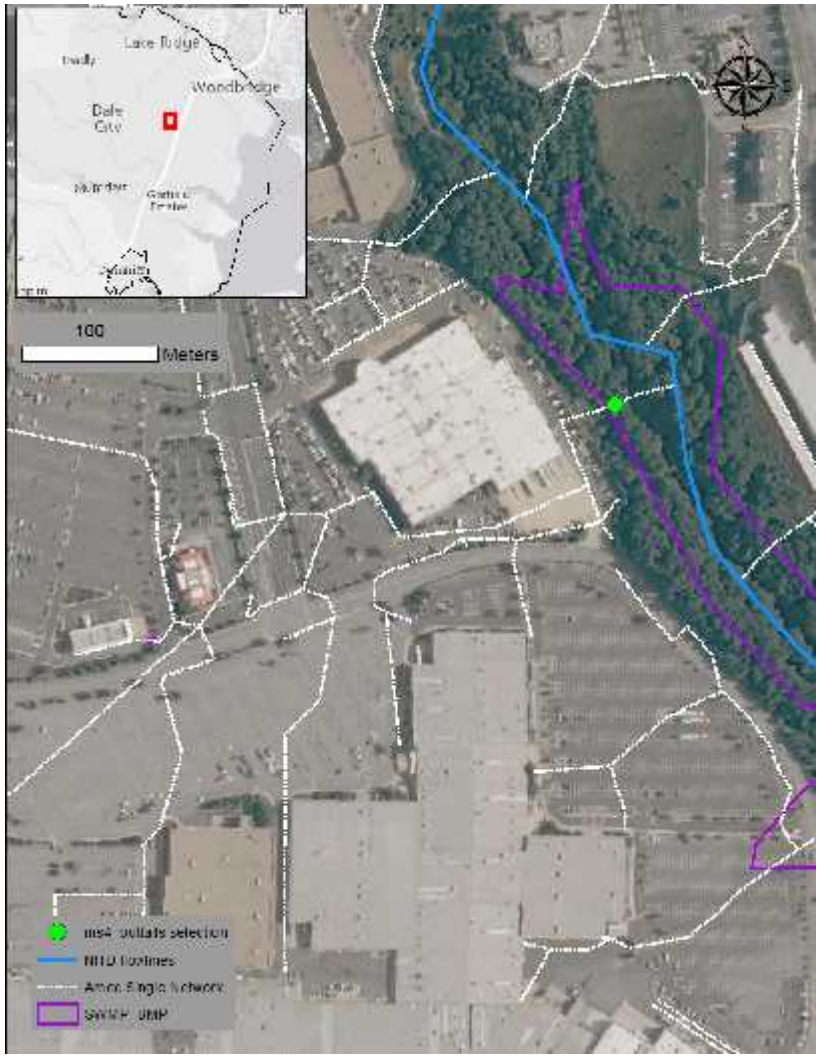
#941: Bull Run, Prince Wm. Parkway



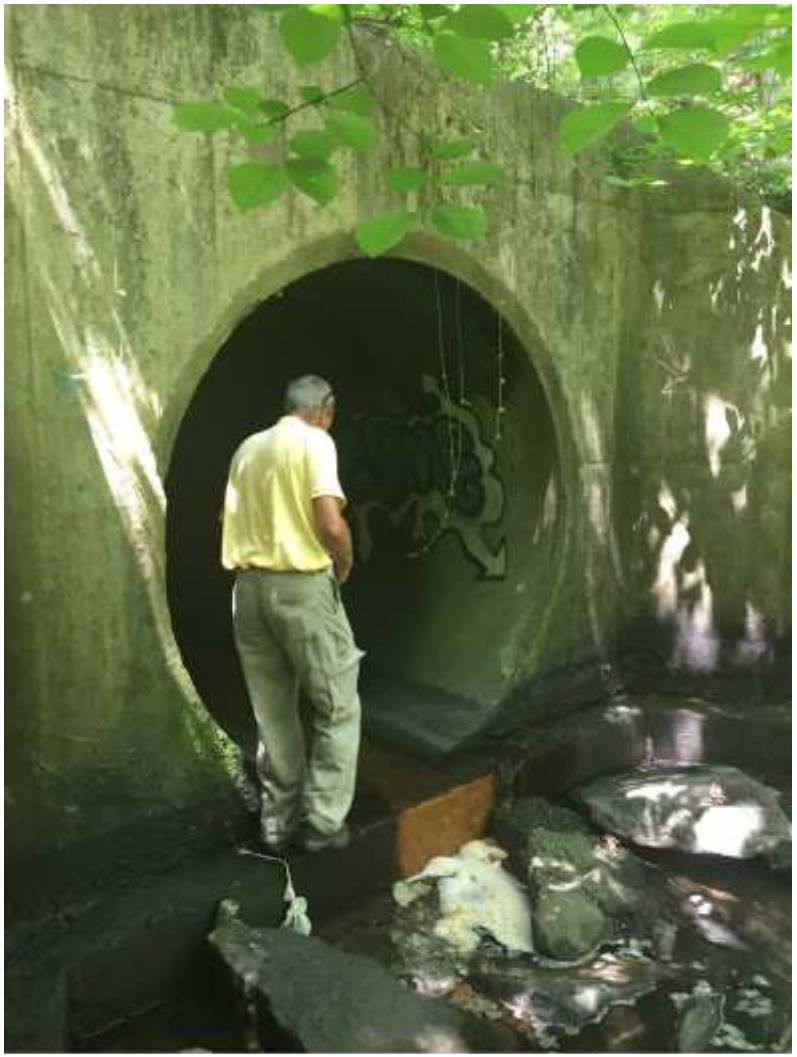
- **54” concrete pipe**
- **Signs of recent repair**
- **¼” water, level with spillway**
- **Debris in spillway**

Access: Easy

#3471: Woodbridge, Potomac Mills



- **84” concrete pipe**
- **< ¼” flow**
- **Signs of human presence, uncertain frequency**



Access: Easy

#4684: Dale City

- **54” concrete pipe**
- **Low flow draining to scour pool**
- **Steep banks surrounding outfall**

Access: Moderate

Additional Slides: Bull Run

Additional Slides: Bull Run

Additional Slides: Pr. Wm. Pkwy

Additional Slides: Pr. Wm. Pkwy

Additional Slides: Pr. Wm. Pkwy

Additional Slides: Potomac Mills

Additional Slides: Potomac Mills

Additional Slides: Potomac Mills

Additional Slides: Dale City

Additional Slides: Dale City

Additional Slides: Dale City

Additional Slides: Dale City

Prince William County

Wet Weather Screening Program

Permit No.
VA0088595

Prince William County Department of Public Works
Watershed Management Branch
5 County Complex Court, Suite 170
Prince William, Virginia 22192

12/1/2015

Table of Contents

I. Introduction

Prince William County is dedicated to providing its citizens with the healthiest environment possible. It is with this goal the County establishes programs aimed at reducing pollutant impacts from heavily urbanized and industrialized areas. Non-point source pollution from urban and industrial areas within the County is a great concern due to its potential to impact water quality. Pollutants are transported from these areas during rain events and often deposited untreated into nearby streams and rivers. To mitigate this issue, the Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VA-DEQ) have instituted programs aimed at reducing the potential impact of pollutants from urban areas.

Under the Virginia Pollutant Discharge Elimination System Permit Program (VPDS) and Virginia Stormwater Management Program (VSMP) permits are issued aimed at reducing pollution runoff from industrial and urban areas containing Municipal Separate Storm Sewers Systems or MS-4s. These systems transport water from urbanized areas to streams and rivers and are a major concern of point and non-point source pollution. Discharges from MS4s are regulated under the Virginia Stormwater Management Act and Clean Water Act (CWA) through permits issued by DEQ and the EPA. Through this program, Prince William County maintains a Phase 1 VSMP MS-4 permit (Permit No. VA0088595).

Through its VSMP permit, the County is required to monitor pollutants from areas suspected to be contributing excess levels of pollutants to its MS-4 by implementing a Wet Weather Screening Program. Unlike the Dry Weather Monitoring Program, the Wet Weather Screening Program is aimed at assessing pollutant load and composition during rain events. Using information obtained through this program, the County is to then develop strategies to reduce this pollutant load from these areas. The County's MS-4 permit, issued on December 17th, 2014, outlines requirements for the Wet Weather Screening Program as follows:

> ***I.B.l).2) Wet Weather Screening Program****:* In addition to the monitoring required in Part I.C., the permittee shall continue to investigate, and address areas within their jurisdiction that are suspected to be contributing excessive levels of pollutants to the MS4. No later than 12 months after the effective date of this permit, the permittee shall develop written procedures for a wet weather screening program which shall include standard operating procedures to be used for initial screening and follow-up purposes. The written procedures shall be incorporated as part of the MS4 Program Plan.

The County has identified potential high risk discharge sites through its hotspot analysis GIS model. This model will be used to guide site location through the identification of areas designated for further research during the field screening stage of the program. A qualified laboratory or contractor will be chosen to perform field sampling, and to present results to the County

This program manual describes the methods and procedures for Prince William County's Wet Weather Screening Program. All procedures are subject to modification as program feasibility and applicability are assessed during program implementation. All program modifications will be noted as part of the County's Program Plan.

II. Wet Weather Monitoring Site Selection

Using the IDDE hotspot Identification and Analysis Model as a basis, locations for Wet Weather monitoring are to be assessed and selected by County personnel. Initial screening locations will be selected using the Hotspot Identification tool and additional GIS desktop analysis. Sites selected in initial screening will be investigated further through field screening activities. Final sites for Wet Weather Screening will be identified using results from the field screening process.

i. Initial Site Screening

The IDDE Hotspot Identification and Analysis model is a tool used by the County to determine where to focus Dry Weather Monitoring Activities. The tool uses several metrics to determine where the highest probability of illicit discharges and discharge of pollutants are to occur. The tool breaks down the County into ADC zones and prioritizes those ADC zones with the highest probability for pollutant discharge to occur. These zones are then used to schedule which outfalls to screen during Dry Weather Monitoring activities. The Hotspot Identification and Analysis Modeling process can be viewed in the document located in Appendix A, but is explained in lesser detail in the following section.

a) Hotspot ADC Zone selection

The Hotspot ID model uses various GIS data layers to determine pollutant discharge potential. Layers depicting Land Use, Residential development, VPDES permitted facilities, High Risk Land Use, Sanitary Sewer Cross Points, Impervious Area, Outfall Locations, Waterways, and 303(d) listed Impaired waterways are incorporated in the analysis. Each feature within a layer is assigned a probability of discharge, pollutant discharge, or component score according to a perceived ability to pollute (potential of discharge to occur, and potential for that discharge to cause harm to the environment, or in the case of an outfall, the number of potential pollution discharge locations). These probabilities of discharge are then summed within a defined area, in this case ADC zones, in order to determine where in the County illicit or other pollutant discharges are likely to occur.

Land uses are analyzed according to use code. High risk use codes were determined from parcels throughout Prince William County and assigned a relative probability of discharge from 1-5 according to their perceived discharge potential (1 being low, 5 being high).

Table 1 - Probability of Discharge According to Use Code

Use code	Use description	Use Probability
191	Technology Services	1
229	Other Utilities	1
349	Food Stores	1
140	Research and Testing	2
156	Wholesale Warehousing (Condo)	2
224	Sewage	2

343	Convenience Store	2
831	Golf Course	2
832	Golf Course	2
112	Industrial Conglomeration	3
151	Mini Warehousing	3
216	Auto Parking	3
311	Small Shopping Center	3
312	Shopping Center	3
313	Shopping Center	3
314	Large Mall	3
315	Large Mall	3
317	Shopping Center	3
318	Shopping Center	3
320	Building Materials	3
351	Restaurant	3
352	Restaurant	3
353	Restaurant	3
354	Restaurant	3
361	Motor Vehicle Sales	3
520	Barber/laundry/cleaners/etc	3
590	Barber/laundry/cleaners/etc	3
841	Swimming Pool	3
851	Marina	3
910	Agricultural Resources	3
911	Agricultural Resources	3
930	Agricultural Resources	3
121	Durable Manufacturing	4
126	Durable Manufacturing (Condo)	4
131	NonDurable Manufacturing	4
150	Wholesale Warehousing	4
160	Industrial Service Garage	4
190	Other Industrial	4
211	Railroad	4
212	Rail Rapid Transit	4
213	Bus	4
214	Motor Freight Transportation	4
219	Other Transportation	4
225	Solid Waste Disposal	4
344	Convenience Store with Gas	4
362	Gas and Service Station	4
363	Gas Station	4
369	Other Automotive	4
540	Other Repair	4

973	Storage Yard	4
366	Service Station	5
530	Motor Vehicle Repair	5

Also included in the analysis are parcels for which VPDES permits are associated. Permitted sites were screened for those which discharge into Prince William County's MS-4 and assigned a probability of discharge in the same manner as high risk parcels above. The results of this analysis are displayed below.

Table 2 - Probability of Discharge Scores for VPDES Permitted facilities

NAME	Permit No.	Score
PWCBOCS	VAR051078	0
CHASE DAVID D	VAG830458	1
GENERAL DYNAMICS LAND SYSTEMS INC	VAR051293	1
OVERNITE TRANSPORTATION CO	VAR051030	1
US FOODSERVICE INC	VAR051117	1
OLD DOMINION FREIGHT LINE INC	VAR051476	1
REMODELERS CREDIT CORP	VAR051996	2
PWC	VAR051477	2
FURR FLOYD H AND BARBARA J	VAG750237	2
SUPPORT TERMINALS OPERATING PTNSHP	VAR051039	2
7905 LC	VAR052008	2
W M TINDER INC	VAR052074	2
EVERED INC	VAR052190	3
POTOMAC & RAPPAHANNOCK TRANSPORTATION E	VAR051886	3
LAND VENTURE ONE L C	VAR051295	3
DALRYMPLE REALTY CORPORATION	VAG110100	3
THIRD GENERATION L P	VAR051085	3
KRAUSS RICHARD L TR	VAR050983	3
NEWBILL HOLDINGS LLC	VAR051639	3
ARCHIE HENRY E SR & ANNIE WILLIAMS	VAR052115	3
BURBAGE J E JR E M BURBAGE	VAR051939	3
VENABLE JEAN S	VAR052243	3
HOFFMASTERS MARINA INC	VAR051183	3
SLURRY PAVERS INC	VAR051911	3
DAVIS TEDDY R JR HELEN M ETAL	VAR052014	3
ENNSTONE INC	VAG110111	4
COSNER MEDFORD R	VAR051009	4
VIRGINIA CONCRETE CO INC	VAG110083	4
DALRYMPLE REALTY CORP	VAR051949	4
JULIUS BRANSCOME INC	VAR050908	4
JONES SAMUEL M ESTATE	VAR051298	4
CONCRETE PIPE AND PRODUCTS CO INC OF	VAG110313	4

ARBAN CAROSI INC	VAG110068	4
HARD ROCK CONCRETE LLC	VAG110067	4
SUPERIOR PROPERTIES INC	VAR051992	4
SUPERIOR PAVING CORP	VAR050901	4
POTOMAC LANDFILL INC	VAR051073	5

Additional values scored in the analysis include outfalls, cross connection points, residential development, impervious area, streams, and impaired waterways. These features are scored as described in the table below.

Table 3 - Discharge Probability Scores for other Features

NAME	Score
Outfalls - Standard	10
- **VPDES Outfalls**	30
- **High Risk Outfalls**	30
Cross Connection Points	20
Residential Areas	1
Impervious Area	1
Streams and Waterways	1
Impaired Streams and waterways	2

As stated above, scores where then summed within an ADC index area. The ADC index is a mapping tool used by the County for navigation. The ADC index's break the County into equal area blocks which are assigned alpha-numeric values that help identify their location within the County for mapping. These equal area blocks are ideal for use in segmenting the County for stormwater analysis and Dry Weather Monitoring activities. The top 20 ADC indexes are to be selected for further analysis as described below.

b) Field Screening Site Selection

Once the initial 20 ADC zones are selected for potential field screening they will be narrowed down to a final 5 for field screening. The 20 ADC zones selected in the first screening are sufficient for Dry Weather Monitoring activities, but need to be further analyzed for use in the Wet Weather Monitoring program due to different constraints on the program. ADC zones will be scored according to the worksheet in Appendix B. The Desktop analysis worksheet analyzes the following aspects of each ADC zone:

- **Ms-4 service area** – The focus of the Wet Weather Monitoring Program is to assess pollutant discharges within areas covered under its VSMP MS-4 Permit. For this reason ADC zones with drainage areas discharging to the County's MS-4 will be required.

- **Size of drainage system** – Drainage systems in Prince William County can span many acres. It is important to select candidate sites with drainage systems that allow the County to focus on a particular type of land use category. Monitoring larger drainage systems is also complicated due

to the increased probability of MS-4 interconnectivity. Monitoring drainage catchments that include VDOT or other MS-4s can reduce the value of results by convoluting the identification of pollutant sources. Although such data may be valuable in some circumstances, it is not the County's goal for this program.

- **Location of drainage system** – Identifying which land uses drain into candidate sites allows for a better characterization of the pollutant-land use relationship. Selecting candidate sites that involve succinct, identifiable drainage locations is a priority.

- **Land use, VPDES permits** – Areas with a high density of high risk land use and/or VPDES permits will be preferred. These areas have a higher probability of pollutant discharge, and therefore are of particular interest to the County. A more homogeneous mixture of land use is preferred. This gives the County a better understanding of the types of pollutants discharged from a particular land use, and helps develop better strategies for reducing pollutant loadings. For example, a site which drains mostly from commercial land uses will give the County a better understanding of the discharges coming from these areas, as opposed to a mixture of many different land uses (Commercial/industrial/residential), where the pollutants identified during monitoring cannot be as easily attributed to their sources.

- **County Easements** – In order to be able to run the monitoring station, the County must have legal authority to place it within the stormsewer system. Candidate sites must have access through County maintenance and repair easements. Proper permissions must be given by any stakeholders that may be attached to the site. Sites are preferred to be easily and safely accessible to staff and lab officials collecting samples.

- **Potential Monitoring sites** – Due to time constraints to County staff, sites which have more potential monitoring sites will be preferred. A site which contains more potential monitoring sites reduces the amount of travel and assessment time as opposed to visiting ADC zones with only one potential monitoring site. This also gives the County more choices to find an acceptable Wet Weather Monitoring location.

ii. Final Site Selection

The final sites selected will be evaluated further through a field assessment. Potential sites will be evaluated using the scoring matrix provided in Appendix C. This form incorporates all aspects of final site selection protocol in order to quantifiably compare potential monitoring locations. Factors that influence final site selection are as follows:

Evaluate environmental impact of site – Identify and locate areas where aggregate materials are stored, vehicles are permanently parked, the location of dumpsters and grease traps, locations where spills may occur. Identify potential pollutants that could enter the environment for the sampling site.

Evaluate outfall locations for potential sampling – Locate outfalls and further evaluate ability to facilitate sampling equipment. It is difficult for a desktop analysis to full convey outfall conditions including ease of access and its ability to house sampling equipment. Assess whether the outfall is in good condition, headwalls are intact, and if the outfall is submerged or blocked by sediment. Assess potential security issues for sampling equipment. Identify all potential monitoring sites.

Evaluate Drainage Systems for overall sampling impact – more specifically identify areas from which the monitoring site drains. Confirm land use for businesses/industry contributing to runoff.

The top two scoring sites will be selected for Wet Weather Monitoring. Sites selected will be gauged to determine flow rates, and measured for the retrofit of sampling equipment.

III. Wet Weather Monitoring Field Procedures

i. Sampling Methods

Sampling will be accomplished using an automated sampler. The sampler is an electronic sampling device which collects discrete samples of stormwater runoff at intervals throughout a storm event. Flow rates will be recorded in order to compute flow weighted composite samples. This should provide the County with an idea of how pollutant concentrations change during the length of a storm event.

Samplers will be attached to outfalls of sampling sites as selected in the above protocol. When applicable, grab samples may be utilized in order to gather analyte data such as TPH. The specific model of sampler will be determined by the contractor or contracted laboratory when selected to perform modeling activities.

ii. Analytes

The Wet Weather Monitoring Program will test for a host of analytes commonly found in stormwater runoff. These include various nutrients, metals, hydrocarbons, and sediments. Many of these analytes are also measured as part of the County's Dry Weather and In-Stream Monitoring programs. A list of these analytes can be seen below.

Table 4 - Wet Weather Program Monitoring Analytes

Analyte
pH
COD
Zinc
Copper
Led
Nickel
Total Phosphorous
Total Kjeldahl Nitrogen
Nitrate and Nitrite
TSS
Ammonia as Nitrogen

This list will be modified during the life of the program. Analytes may be added/removed according to results obtained during monitoring according to the effectiveness of monitoring efforts. Analytes will also be added or removed as recommended by assigned contractor or laboratory responsible for monitoring efforts.

iii. Sampling Schedule

There is no specific sampling schedule or threshold presented in the County's MS-4 Permit. The County would like to assess two Wet Weather Monitoring sites on a biennial basis. This allows the County to assess the concentration of pollutants during the first yearly cycle, install appropriate BMP's designed to reduce pollutants, and finally use the second yearly monitoring cycle to assess the installed BMPs effectiveness. Samples will be taken at the two sites on a quarterly basis. Once the two year monitoring cycle is complete, two additional sites will be selected for Wet Weather Monitoring activities using the protocols described in the preceding sections. During this time, program procedures will be re-evaluated and updated as needed.

IV. Documentation and Reporting

This section will describe the documentation and reporting processes for the County's Wet Weather Monitoring Program.

i. Site Selection

Results of site selection will be presented in the County's Annual Report once complete. This includes procedures for the desktop and field analysis protocols presented in this document. All applicable forms, site plans, photos, diagrams, and calculations will be included in this analysis. All procedures dealing with site selection should be completed by the County's next annual reporting period (June 30TH, 2016). Information detailing the sites location (latitude and longitude), internal ID number,

ii. Monitoring Station Construction

Processes detailing monitoring site installation and construction will be included in the County's Annual Report when completed. Details on the type of automatic sampling hardware, including in depth procedures dealing with the sampling and transportation of samples, as well as analyte processing procedures will be included in the updated manual once determined by contractor or certified laboratory. All maintenance activities on monitoring hardware will be reported as completed.

iii. Annual Reporting

As required by the County's MS-4 permit, each annual report will include a list of locations Wet Weather Screening has occurred and the results of monitoring samples. In addition, the County will include as part of each annual report the weather conditions, date and time, and time of most recent storm event for each discrete sample taken. Meteorological data associated with the most recent storm event to the time of sample taken will be gathered from weatherunderground.com.

iv. Trends and Long Term Analysis and Program Follow-up

As the County is proposing to monitor sites on a biennial basis, each annual report will present monitoring trends. This will include a trends analysis as samples are processed quarterly for the year, as well as an assessment of effectiveness of BMP's installed as part of the biennial monitoring process. Results from year 1 of monitoring efforts will be used to implement BMP's in the monitoring site drainage area aimed at reducing critical pollutants. The effectiveness of those BMP's will be evaluated in year 2 of the Wet Weather Monitoring Program. All results of this analysis will be presented in the County's Annual Report.

Appendix A – Hotspot Identification and Analysis Model

Prince William County

Wet Weather Screening Program

12/1/2015

Introduction

As a requirement for meeting guidelines mandated by the USEPA (Part 1.B.2.I)1) of Permit No VA0088595), Prince William County must identify and inventory "areas of concern" or areas predisposed to illicit discharges within its Municipal Separate Storm Sewer system (MS4). These "areas of concern" include: areas such as car washes, car dealerships, pet kennels, and restaurants; sites with previously occurring illicit discharges; areas of older development; areas representing the general land use of the county; sites with a history of citizen complaint; and areas located near environmentally sensitive features. Previously the County identified areas for dry weather monitoring by using a schedule of grids and a subjective assessment of areas of interest. In an attempt to generate a more quantitative assessment of illicit discharge "hot spots" around the County, a GIS based risk assessment was developed.

Variables

GIS layers

- County Municipal boundaries and ADC Index
- Land Use
- Residential Development
- VPDES Permitted Facilities
- High Risk Land Use Facilities
- Sanitary Sewer Cross Points
- Impervious Area
- County Outfall locations (outfalls >15in)
- County Streams
- 303(d) listed Impaired Virginia Waterways
- Raster based County imagery

Data

- Previous discharges according to land use
- History of citizen complaint according to land use

Procedures

Data Collection

Data layers were collected from the County GIS system via database linkage within version 10.3 of ArcGIS, with the exception of the 303(d) listed impaired streams data, which was acquired through the DEQ website.

Initial Layer Synthesis and Input

In order to complete the hotspot analysis, data layers must be modified to yield the information needed. First, use codes were assessed for various land uses of interest and used to select a subset of parcels which could be determined as "high risk" land uses. A "use probability" was applied to each land use, which characterizes a land use's probability for a discharge to occur, and potential severity of that discharge should it occur. This "use probability" is initially applied subjectively, but will be further defined as more data from the IDDE program is gathered and can be re-input into the model. Figure 1 displays the location of various land uses of interest of Prince William County.

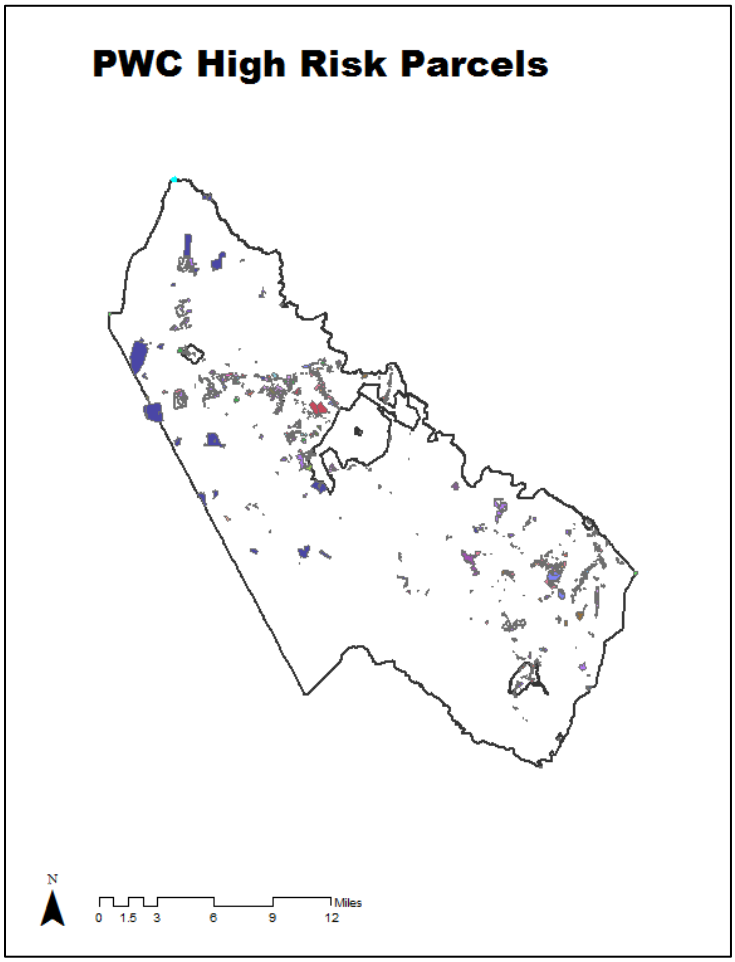


Figure 1: High Risk Parcels hotspot identification map

The impact value is a number from 1 to 5 characterizing each land use according to the potential of illicit discharge occurrence (determined from historical discharge data, low probability denotes low risk) and potential discharge severity (an assumption of the possible damage that may occur from a discharge). A list of land uses, use codes, and the initial scores given to the land uses can be seen below in Table 1.

Table 5: Impact values for Land Use hotspot identification

Use code	Use description	Use Probability
191	Technology Services	1
229	Other Utilities	1
349	Food Stores	1
140	Research and Testing	2
156	Wholesale Warehousing (Condo)	2
224	Sewage	2
343	Convienience Store	2
831	Golf Course	2
832	Golf Course	2
112	Industrial Conglomeration	3
151	Mini Warehousing	3
216	Auto Parking	3
311	Small Shopping Center	3
312	Shopping Center	3
313	Shopping Center	3
314	Large Mall	3
315	Large Mall	3
317	Shopping Center	3
318	Shopping Center	3
320	Building Materials	3
351	Restaurant	3
352	Restaurant	3
353	Restaurant	3
354	Restaurant	3
361	Motor Vehicle Sales	3
520	Barber/laundry/cleaners/etc	3
590	Barber/laundry/cleaners/etc	3
841	Swimming Pool	3
851	Marina	3
910	Agricultural Resources	3
911	Agricultural Resources	3
930	Agricultural Resources	3
121	Durable Manufacturing	4
126	Durable Manufacturing (Condo)	4
131	NonDurable Manufacturing	4
150	Wholesale Warehousing	4
160	Industrial Service Garage	4
190	Other Industrial	4
211	Railroad	4
212	Rail Rapid Transit	4

213	Bus	4
214	Motor Freight Transportation	4
219	Other Transportation	4
225	Solid Waste Disposal	4
344	Convienience Store with Gas	4
362	Gas and Service Station	4
363	Gas Station	4
369	Other Automotive	4
540	Other Repair	4
973	Storage Yard	4
366	Service Station	5
530	Motor Vehicle Repair	5

The same process was used for VPDES general stormwater discharge permit holders within the County. VPDES permitted facilities were identified using data obtained from DEQ. A determination on which VPDES permittees discharged into the County's MS-4 system was made, and a score (discharge probability) was assigned to each facility according to its assumed probability to discharge pollutants.

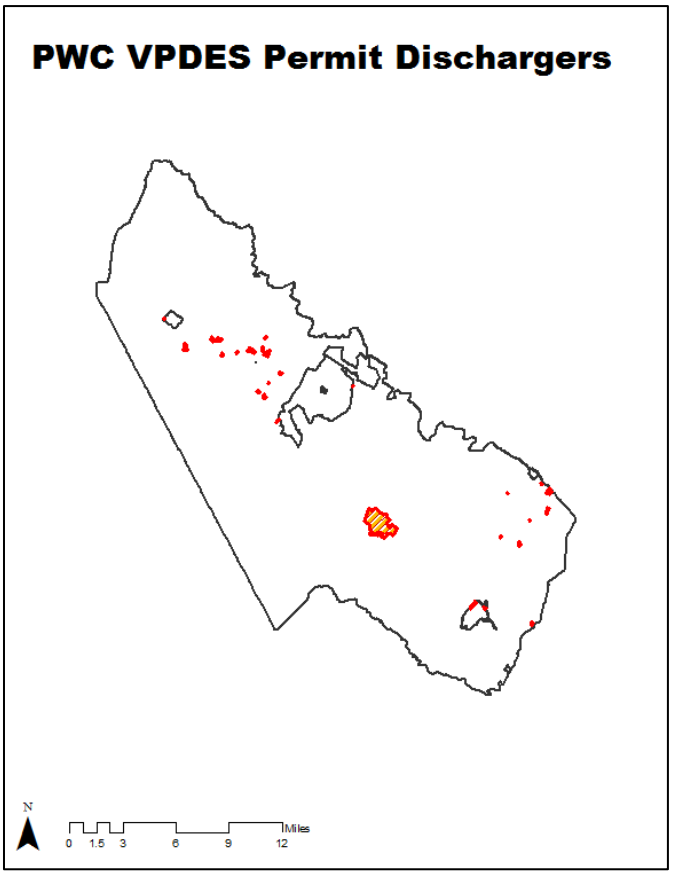


Figure 22: VPDES permitted facilities hotspot identification map

Table 2: Impact values for VPDES hotspot identification

NAME	Permit_No	Score
PWCBOCS	VAR051078	0
CHASE DAVID D	VAG830458	1
GENERAL DYNAMICS LAND SYSTEMS INC	VAR051293	1
OVERNITE TRANSPORTATION CO	VAR051030	1
US FOODSERVICE INC	VAR051117	1
OLD DOMINION FREIGHT LINE INC	VAR051476	1
REMODELERS CREDIT CORP	VAR051996	2
PWC	VAR051477	2
FURR FLOYD H AND BARBARA J	VAG750237	2
SUPPORT TERMINALS OPERATING PTNSHP	VAR051039	2
7905 LC	VAR052008	2
W M TINDER INC	VAR052074	2
EVERED INC	VAR052190	3
POTOMAC & RAPPAHANNOCK TRANSPORTATION E	VAR051886	3
LAND VENTURE ONE L C	VAR051295	3
DALRYMPLE REALTY CORPORATION	VAG110100	3
THIRD GENERATION L P	VAR051085	3
KRAUSS RICHARD L TR	VAR050983	3
NEWBILL HOLDINGS LLC	VAR051639	3
ARCHIE HENRY E SR & ANNIE WILLIAMS	VAR052115	3
BURBAGE J E JR E M BURBAGE	VAR051939	3
VENABLE JEAN S	VAR052243	3
HOFFMASTERS MARINA INC	VAR051183	3
SLURRY PAVERS INC	VAR051911	3
DAVIS TEDDY R JR HELEN M ETAL	VAR052014	3
ENNSTONE INC	VAG110111	4
COSNER MEDFORD R	VAR051009	4
VIRGINIA CONCRETE CO INC	VAG110083	4
DALRYMPLE REALTY CORP	VAR051949	4
JULIUS BRANSCOME INC	VAR050908	4
JONES SAMUEL M ESTATE	VAR051298	4
CONCRETE PIPE AND PRODUCTS CO INC OF	VAG110313	4
ARBAN CAROSI INC	VAG110068	4
HARD ROCK CONCRETE LLC	VAG110067	4
SUPERIOR PROPERTIES INC	VAR051992	4
SUPERIOR PAVING CORP	VAR050901	4
POTOMAC LANDFILL INC	VAR051073	5

Since the point of discharge is the ultimate target of the analysis, outfalls greater than 15 inches were identified through Prince William County. Applicable outfalls were identified and isolated using the feature selection tool and processed into an individual layer. The greater the density of outfalls within

an area the larger the chance of a discharge occurring. Outfalls associated with VPDES and High Risk facilities were also determined by creating a buffer around VPDES and High Risk parcels, and capturing all outfalls within the buffer. Outfalls were given a uniform impact value and factor in during the overall hotspot analysis (Standard outfall = 10, VPDES outfall = 30, High Risk Outfall = 30). Figure 3 displays the location of outfalls within the county.

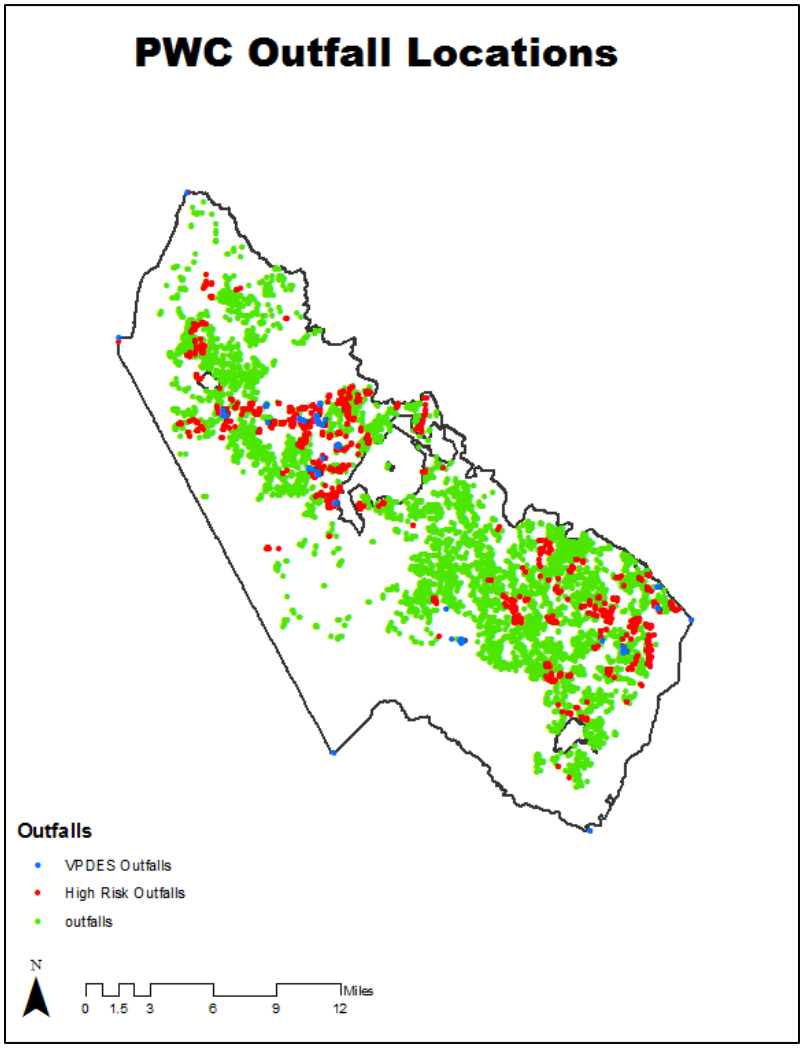
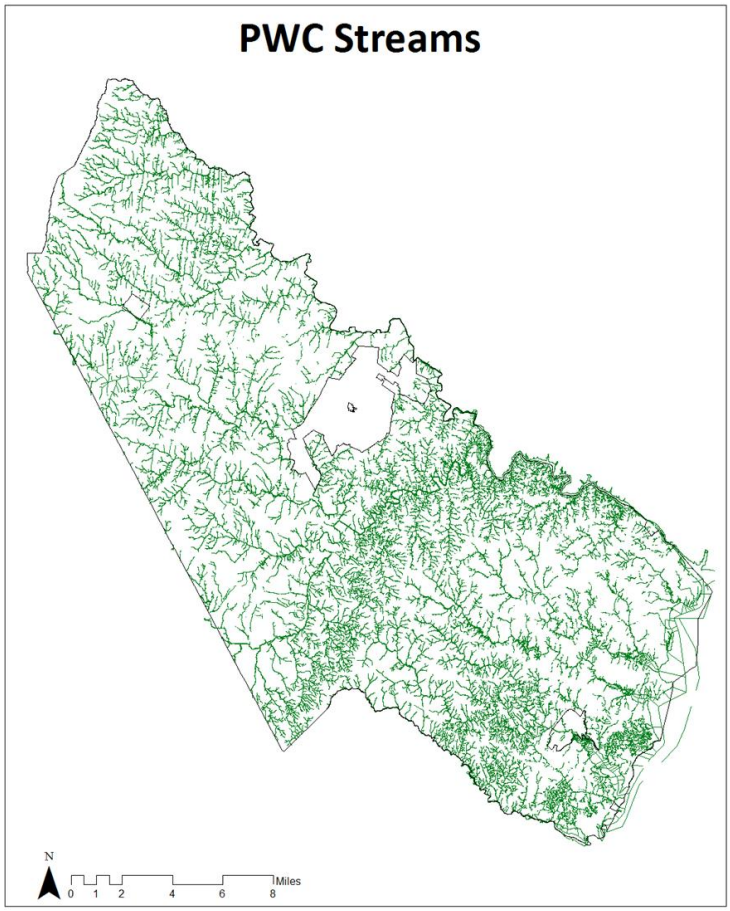


Figure 3: Location of outfalls within Prince William County

To address the potential impact of illicit discharge on environmentally sensitive areas, a streams and water body layer was included in the analysis (Figure 3). Major streams and rivers were isolated from man-made ditches and conveyances within the layer. These streams were given a uniform impact value. The area of stream within a region influences the potential discharge probability score by quantifying the amount of environmentally sensitive features in an area. Streams listed on the EPA 303(d) list of impaired water bodies have a greater potential of impact from illicit discharges and are therefore given an additional weight in model outputs.



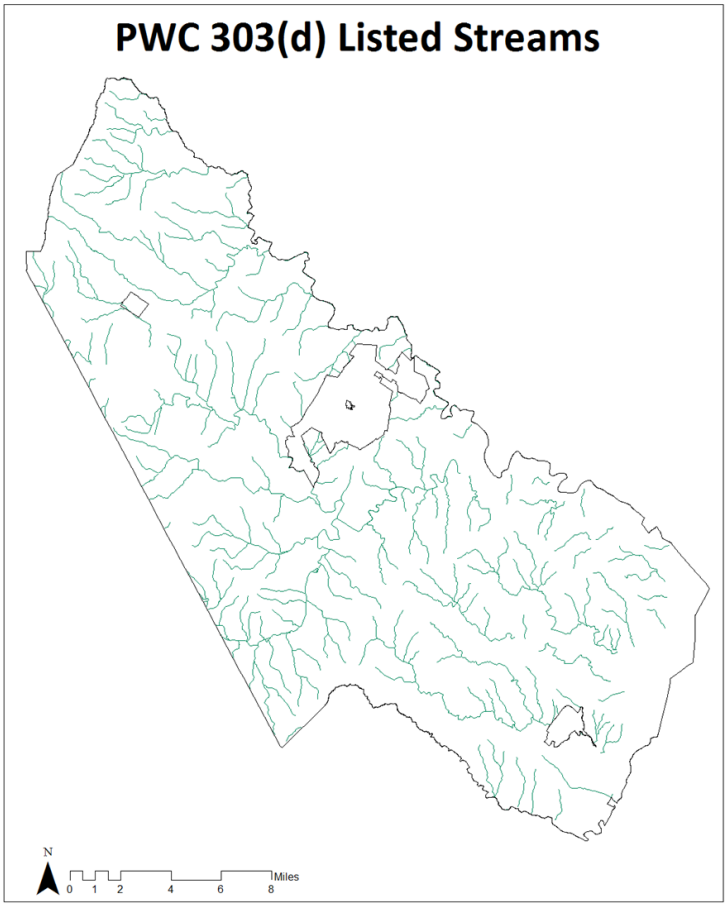


Figure 4: Streams and impaired streams within Prince William County's jurisdictional area

Next an assessment of potential areas for cross connections between the storm sewer and sanitary sewer system was performed. Areas where the storm and sanitary sewer system overlap create potential for cross contamination due to leaking sanitary sewer infrastructure. This analysis was accomplished by overlaying the storm and sanitary sewer layers using GIS, and isolating the locations where they overlap. These locations were turned into point features and assigned a uniform potential discharge probability score (20). This analysis is displayed below in Figure 5.

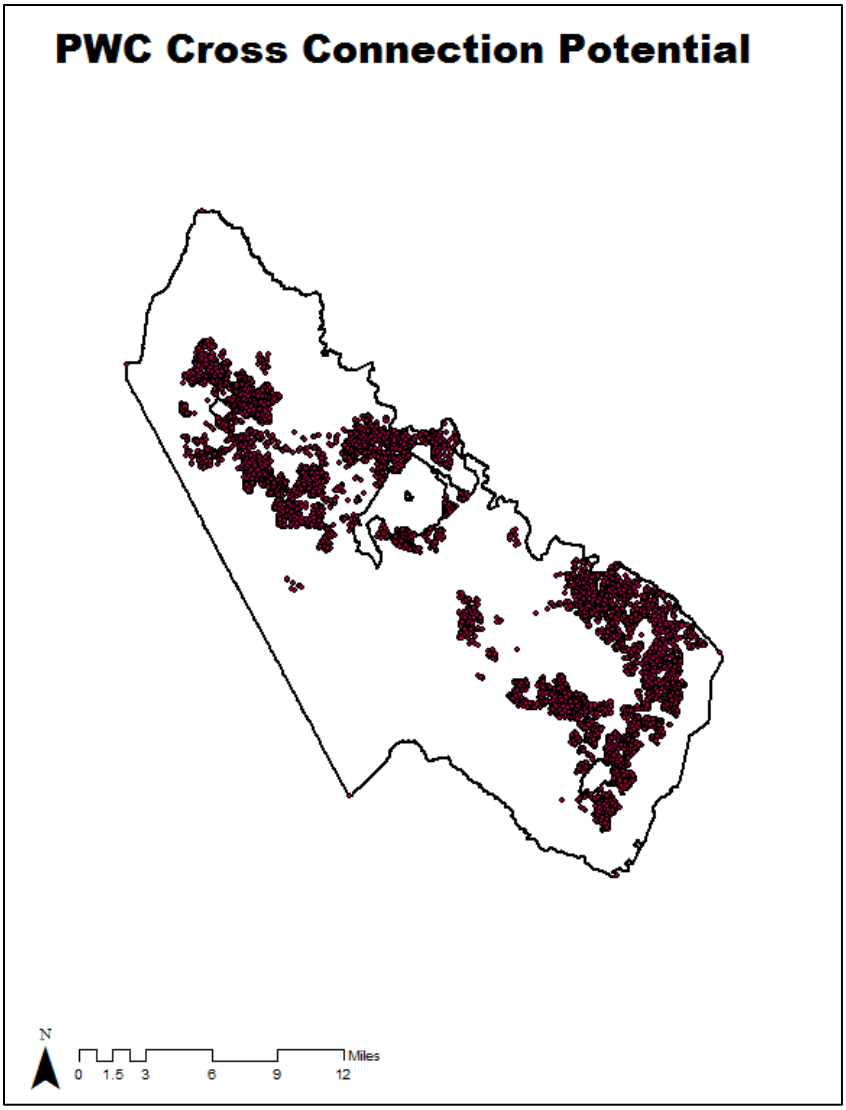


Figure 5: Location of potential cross connection sites within Prince William County

Often, areas with a higher percentage of impervious surfaces tend to contribute greater to pollutant loads. To account for this, a layer depicting impervious surface within the County was incorporated in the model. Impervious surface area is assigned a discharge score of 1. A low score was selected because the large areas covered by impervious surface can cause large impacts to model outputs. A score which balances the impact of impervious surface on pollutant output without weighing too much into model outcomes was desired. Figure 6 below shows impervious area within the County.

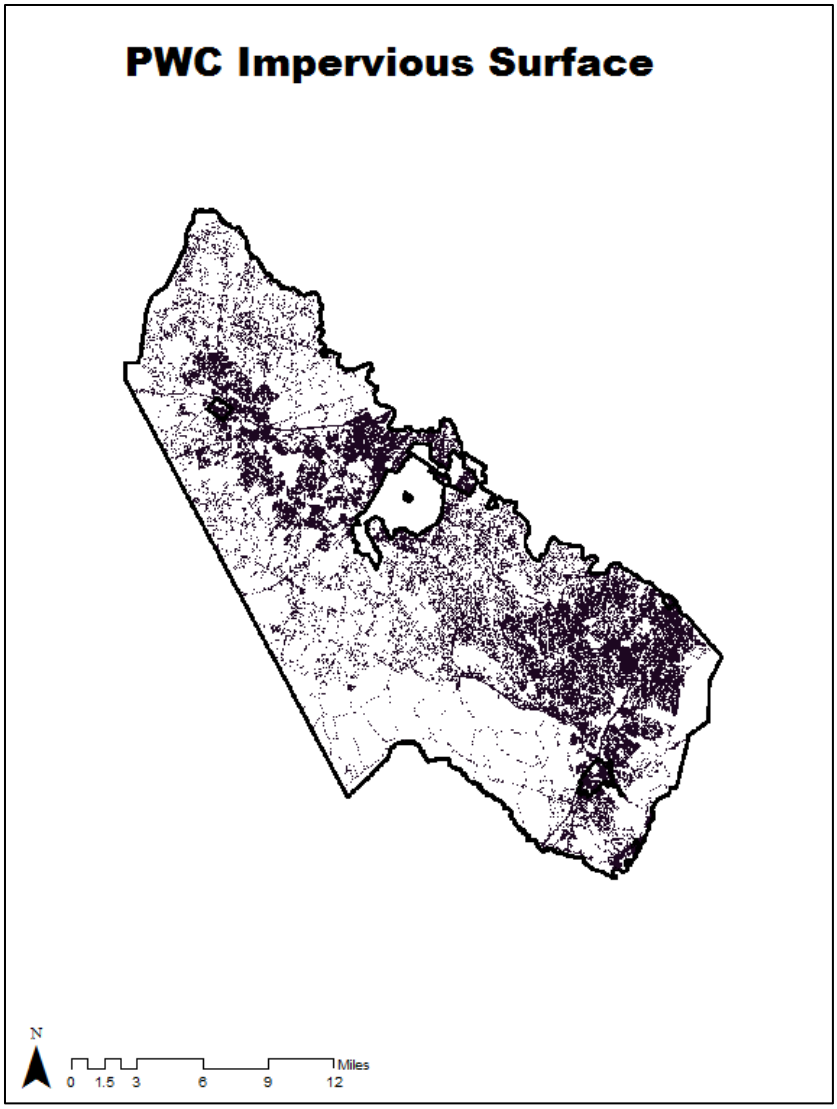


Figure 6: Impervious surface in Prince William County

Lastly, discharges from residential areas had to be accounted for. Although commercial and industrial areas were well represented in the hotspot analysis, residential areas within the County were lacking sufficient input into the model. Using a layer depicting the residential development in the County, these areas were isolated and assigned a discharge score of 1. This gives residential areas a proportioned impact on hotspot scores.

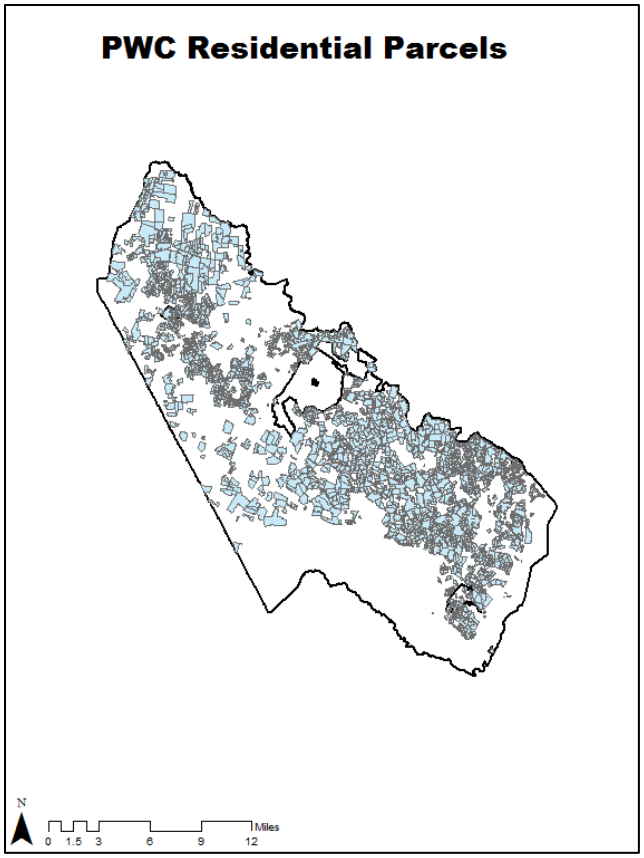


Figure 7: Impervious surface in Prince William County

Hotspot Analysis

Once the layers were manipulated to yield the desired data they had to be combined to produce the final hotspot analysis. Layers were converted from a polygon, line, or point to a raster format to allow for easier compatibility of the various data layers. The Raster format represents data in small cells, allowing for a point by point analysis of each location on the map. It facilitates the ability for data with different layer types (i.e. polygon, line, point) to be combined simply, since they are not compatible otherwise due to differences in shape, size, and location. Areas within a layer where empty space exists cause discontinuity when trying to combine them into the overall analysis. To remedy this, the Reclassify Raster tool was used. This tool removes the "Nodata" classification automatically applied to empty spots in the layer during the raster conversion, allowing a numerical value to be assigned in its place (0). Without this step, only the overlapping areas of data in each layer would be included in the analysis and an incomplete assessment of discharge probability would result.

Each layer was combined for hotspot analysis using the Raster Calculator tool. This tool preforms simple mathematical operations at the cellular level, to combine the data into an overall assessment of County hotspots. The tool essentially adds together each included layer combining the discharge probability scores from each cell. Figure 8 below shows a simple representation of this process.

Data is then transposed to the ADC index and watershed maps of the County through simple Spatial Statistics tool. The Spatial Statistics tool performs a basic statistical analysis on raster cells within a specified polygon. For the purpose of this study the mean and sum of probabilities within both the

ADC index areas and sub-watersheds of the County were assessed.

Analysis using Mean vs. Area (Average) Score

There are various ways to interoperate the data output from the model. A score had to be generated for each ADC Index number and watershed in order to effectively assess and utilize model outputs; however, this presented a problem as to what mathematical method of assessment should be

used. The ArcGIS model is generated to output values for the mean, median, minimum, maximum, and sum of each individual ADC index area and watershed. As stated before, for the purpose of this analysis, only the sum and mean probability of discharge are of interest. The sum is the result of all cells within the identified area added together, while the mean is the average cell value within the area. For a watershed scale analysis, the mean probability of discharge must be used. This is because the area of each watershed differs, leaving the sum of the probabilities of each watershed highly dependent on its size. Larger watersheds will accommodate more cells leading to a larger overall probability of discharge. The ADC index, on the other hand has a uniform area removing the effect of size on the output. This allows for the sum of probabilities to be used, which gives a better overall assessment of the characteristics within that area.

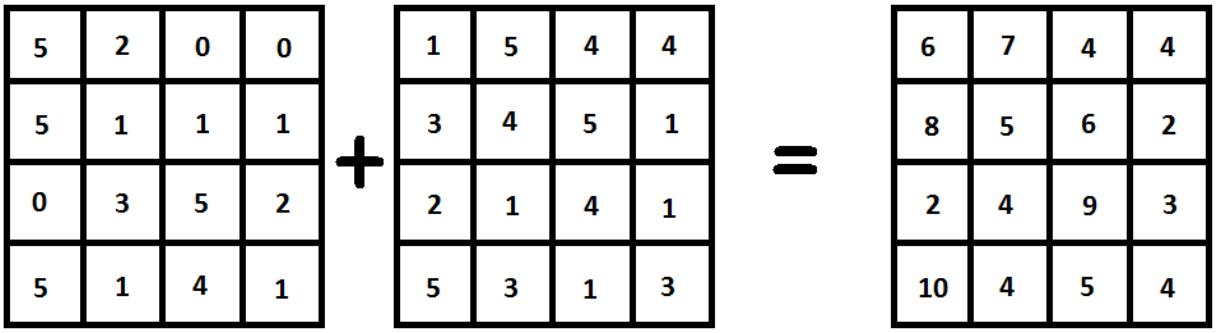


Figure 8: Raster Calculator Example

Isolation of Hotspots and Identification of Outfalls of interest

The first step in using hotspot analysis to identify outfalls for field inspection is to select the ADC index number with the highest probability of discharge is selected from the generated list. The ADC index was chosen as a basis for field analysis for a few reasons: it is easy to navigate to, being the basis for street map navigation; it encompasses a relatively small area, typically containing 8-10 outfalls per Index which is a good size for a day's field assessment; and, it can be combined easily to into a larger area allowing for an broader perspective on illicit discharge trends. Assessing discharges on a watershed scale would incorporate too large of an area and would not be suitable for a quality comparison

between areas of the County. Once an index number is selected, then an index area map is generated showing all outfalls, storm sewer system, roads, and land uses of interest. Each map is created using ArcGIS tools to zoom to the applicable map location (ADC Index number), and to highlight all applicable features. From this map, a list of all outfalls and their size can be created. This map, with outfall information, can then be used as a field guide for the outfall monitoring.

Model Calibration

Model calibration is an important step in model development. Model outputs must be adjusted to more closely portray actual conditions. Since the raster layers used to sum severities in the model skew the data by giving more weight to larger polygons, point-sized items like outfalls must be given a larger value to compensate and allow ADC areas to more closely reflect the desired weight proportion between inputs. The value given to outfalls was adjusted so that their impact on model outputs was more representative of actual conditions.

Originally, some areas of the map contained a high probability of discharge, despite being located in more rural areas. This was found to be due to an increased proportion of streams meandering throughout the grid. In order to correct this, a balance was struck between the impact value given to streams, and their actual impact on real-world conditions. Similarly, rural areas were triggering high probabilities of discharge due to the age of parcel development despite not having substantial storm sewer systems. To remedy this, the residential and commercial layers were given a larger score to better reflect in-situ conditions.

The model will continue to be adjusted as more data becomes available pertaining to discharges within the County. Data will be used to validate and or adjust assumptions made in this version of the model.

Results and Conclusions

The results of the analysis showed areas with the greatest probability of discharge within Prince William County were consistent with previous field observations and expectations. The Route 1 corridor, Bull Run commercial area, and Potomac Mills Mall all generated high probabilities of discharge. Residential areas had a fairly constant probability of discharge. The highest probability of discharge was located around the specified land uses of interest including shopping centers and auto-related industrial areas. Rural areas with little to no storm sewer system recorded the lowest probability if discharge, as would be expected. A detailed map displaying parcel-based discharge probability was created using the methods described above (see figure 9). The land uses of interest are distinctly represented in red describing the highest discharge potential. Residential areas shown primarily in yellow present a moderate discharge potential. Rural areas are mostly indicated in blue, describing a low discharge potential which are most likely out of the scope for dry weather discharge monitoring. Outfall locations and numbers are not factored in this analysis.

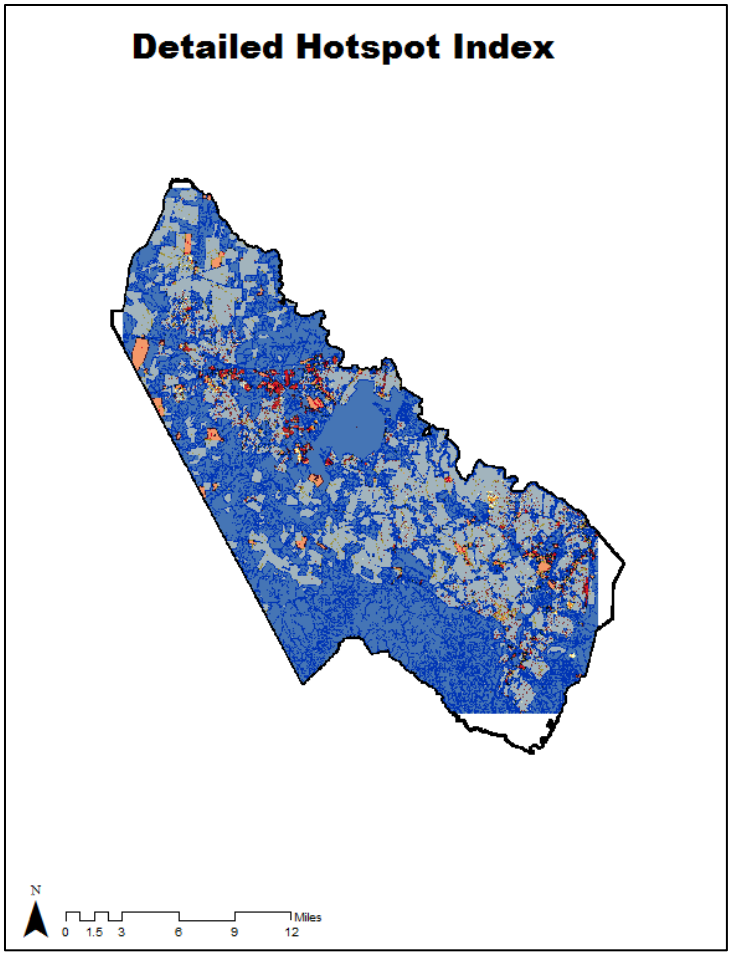


Figure 9: Detailed Discharge Probability

Previously a hotspot analysis was performed on a watershed scale. However, a watershed approach to discharge monitoring tends to skew the data, since discharge probabilities are averaged over the entire watershed making smaller pockets with high discharge; therefore, the ADC index method was determined to be the best.

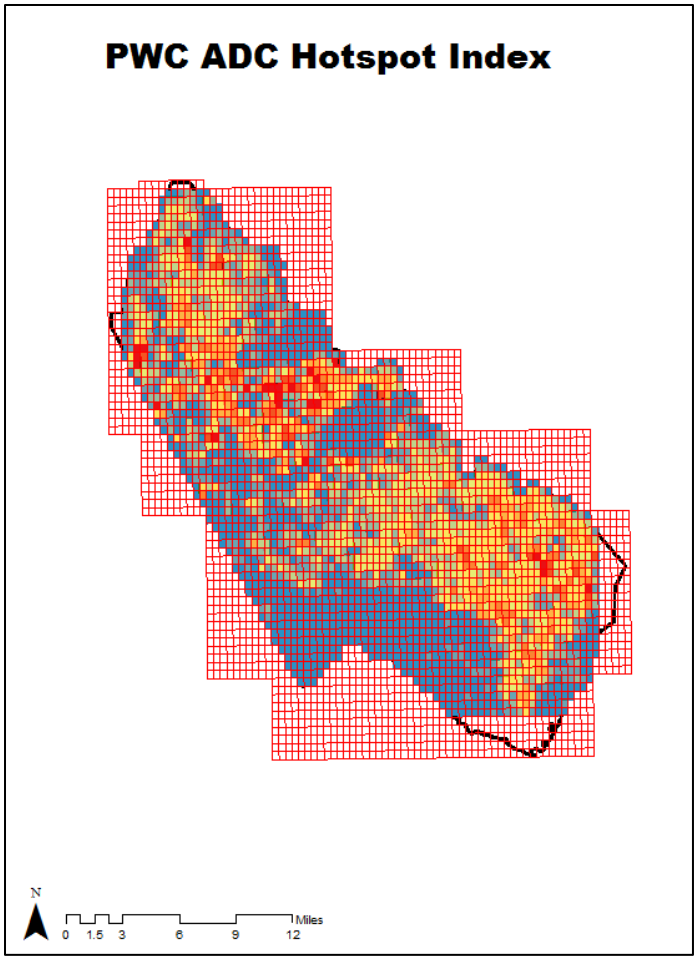


Figure 10: ADC index probability of discharge

The ADC index hotspot map, shown above (figure 10), is used for the inspection scheduling and field analysis of outfalls. As indicated in the parcel and watershed level assessments, County hotspots exist along the Route 1 corridor, Bull Run commercial area, and Town of Haymarket. Unlike the parcel and watershed level assessments, the ADC hotspot map provides a more thorough analysis of where the most probable locations for illicit discharge might actually be present. Table 3, shown below, displays the 50 ADC index areas with the highest probability of discharge. Sorted from highest to lowest, the table serves as the basis for the scheduling of dry weather outfall monitoring in the County.

Table6: Sum and mean probability of discharge scores by ADC index number

ADC_ID	MEAN	SUM
5992-C8	34916	56459172
5990-K5	34175	54919225
5756-G7	31523	51130306
5756-H7	30976	50243072
5991-A6	28771	46896730
5756-G3	27086	43879320
5992-C7	25886	42427154

5992-D7	24576	39641088
6110-G2	24456	39349704
5756-J7	24228	39322044
5757-A2	24170	39227910
5992-A6	23838	39189672
5991-A7	23096	37461712
5992-B6	22846	36782060
5991-A5	22637	36694577
5756-H4	22435	36322265
5992-G9	21579	35605350
5992-H8	21376	35270400
5756-K7	20886	33918864
5874-H7	20478	33542964
5638-G10	20215	33132385
5756-H5	20055	32609430
5756-K6	19838	32097884
5755-C4	19460	31914400
5872-C1	18951	30814326
5992-D8	18811	30624308
5874-J7	18896	30592624
5992-H7	18536	29842960
5756-H8	18295	29839145
5991-G7	18524	29675448
5756-J5	18332	29624512
5992-K10	17877	29211018
5990-C9	17834	29087254
5991-F7	17543	29033665
5992-E10	17820	28921860
5872-H10	17359	28746504
5756-G10	17724	28624260
5756-J6	17357	28222482
5991-B7	17339	28193214
5754-F5	17186	28167854
5756-C10	17250	28031250
5638-H10	17069	27839539
5756-G8	17085	27677700
5992-K6	16869	27597684
5755-E4	16728	27233184
5872-D1	16318	26777838
6110-E3	16210	26762710
5757-H6	16567	26623169
5991-K1	16215	26527740

Future Development of Model

The model will be updated as more detailed discharge information is gathered through the county monitoring program. In addition, updated data layers pertaining to the storm sewer system, outfalls, impaired stream listings, age of development, county land use, and parcel location will continually be introduced to the model. If more specific data on the age of storm sewer infrastructure becomes available, this will also be included in the model. Also, when the extent of the County's MS4 system is identified, model data will be adjusted accordingly. Finally, methods to incorporate the history of complaints and poorly maintained commercial areas will be evaluated and incorporated, if possible, into the assessment. All steps to increase the accuracy of the hotspot analysis will be evaluated for the model on an annual basis, and the model outputs will be re-assessed. An evaluation of the accuracy of the hotspot analysis, as well as verification of model outputs will be conducted on an annual basis.

Appendix B – Desktop Analysis Scoring Worksheet

Appendix C – Field Assessment Scoring Worksheet

Wet Weather Monitoring Report

Third Quarter, Fall 2016

Prepared for:

Prince William County Department of Public Works
5 County Complex Court, Suite 170
Prince William, Virginia 22192

Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
11424 Albemarle Point Place, Suite 115
Chantilly, VA 20151
(703) 488-3700

October 24, 2016
Project No. 151270004

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is pleased to provide this report of wet weather monitoring for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Municipal Separate Storm Sewer System (MS4) Permit (Number VA0088595), issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. This report discusses the results of the Q3 sampling event completed during September of 2016, as well as the findings from the water quality analysis results of that sampling event.

2.0 METHODS

Flow rate data were collected at the outfalls by an ISCO 6712 automated sampler coupled with an ISCO 730 bubbler flow module. Flow level over the course of the sampling event was electronically calculated using ISCO Flowlink 5.1 software, and then converted to discharge using the Manning Equation.

SITE #941; MANASSAS, VA
Site #941 is located near 11850 Livingston Road. The site receives a total of 52 acres of upstream drainage area from a land surface that is 34% impervious. Further evaluation of County data revealed that the pipe is 54 inches in diameter with a slope of -0.106.

SITE #4684; DALE CITY, VA
Site #4684 is located near the corner of Potomac Center Blvd. and Sheffield Way, at 2425 Brookmor Lane. It drains into a BMP for the Potomac Club residential development. Upstream drainage totaled 51 acres, 21% of which is from impervious surfaces. The pipe is 54 inches in diameter with a slope of 1.582.

The automated samplers were deployed when a qualifying storm event (>0.3 inches precipitation) was forecast for the two monitoring sites. On September 16th, Amec Foster Wheeler staff deployed the samplers at both field sites and programmed the samplers' automated, discrete sampling sequence to initiate upon flow levels exceeding 0.25 inches. The samplers were programmed to collect 24 discrete 1L samples to be collected every 30 minutes over a 12 hour duration. Rain gage data were compiled for monitoring stations in the Weather Underground monitoring network. The data were easily accessible online, and provided hourly precipitation totals over the monitoring period. Gages were prioritized based on the makeup of the data record (reporting interval) and then the proximity to monitoring locations.

Following the storm event, staff retrieved the samples and prepared them for shipment to Pace Environmental for water quality analysis. In order to compile the 24 discrete samples into a single flow-weighted composite, discharge was calculated using the Manning Equation:

$$Q = VA = \left(\frac{1.49}{n}\right) A R^{\frac{2}{3}} \sqrt{S} \text{ [US]}$$

Q = Flow rate
A = Flow area
V = Avg. velocity
S = Water surface slope
R = Hydraulic Radius
n = Roughness coefficient
1.49 = English units conversion factor

Channel slopes were determined using invert elevations reported in the stormwater infrastructure geospatial data provided by Prince William County. Using flow levels reported by the ISCO samplers, the area and hydraulic radius inside the sampled outfalls could be computed for a given time interval. A Manning's n of 0.013 was assumed for the concrete pipes. Once the discharge rate was calculated, the trapezoidal method was used to compute the total volume of flow between each time interval. Discrete samples collected over the duration of the storm event were them based on their representative weight within the cumulative flow curve for each storm event. This flow weighted composite sample was provided to the laboratory for analysis. The resulting analysis is considered the event mean concentration (EMC) of the individual analyte.

3.0 RESULTS

SITE #941

Sampling occurred from 08:30 – 20:30 on Monday, September 19. Precipitation data recorded at Dulles International Airport (KIAD) totaled 0.4 inches over the 12 hour sampling period. Temperatures ranged from 69-73 degrees F. All 24 of the discrete samples were successfully retrieved the following day.

SITE #4684

Sampling occurred from 08:40 – 20:40 on Monday, September 19. Precipitation data recorded at Ft. Belvoir, VA (KVAALEXA115) totaled 0.94 inches over the 12 hour sampling period. Temperatures ranged from 71-75 degrees F. The previously measured rain event at this gauge occurred 12 days prior, totaling 0.4 inches of accumulation. Due to an unexpectedly large storm flow, the sampling setup was dislodged from the outfall. Thus, only three of the anticipated 24 samples were successfully collected by the ISCO sampler, covering the first 1.5 hours of the storm event.

3.1 FLOW DATA

SITE #941

Flow ranged from 0.468 to 10.130 cfs. The storm event hydrograph compared with cumulative volume can be seen in Figure 1 below. Table 1 lists the proportion of each sample mixed with the flow-weighted composite.

Figure 1: Flow data over time for the storm event at Site #941 on September 19, 2016.

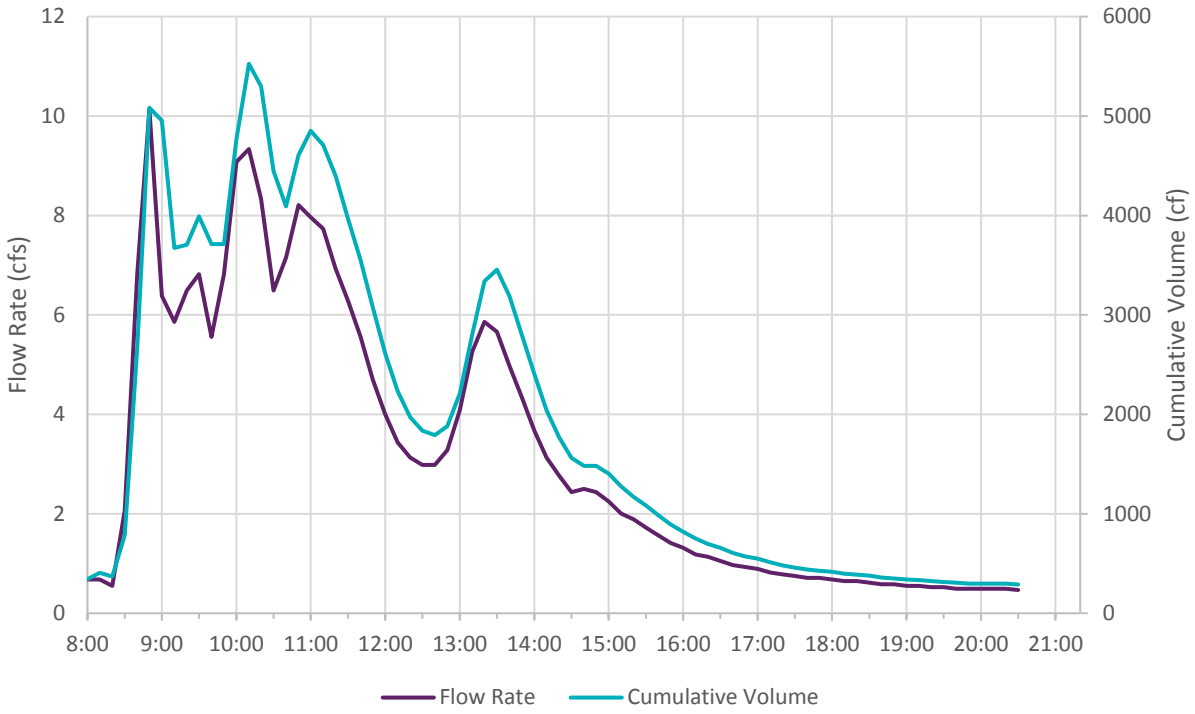


Table 1: Summary of Flow Weighted Composite – Site #941

Bottle #	Time of Sample	Volume (CF)	% of Flow	Flow Weighted Volume*
1	8:30:00	1561.982278	1.07%	0.10
2	9:00:00	12703.0171	8.73%	0.79
3	9:30:00	11371.68983	7.82%	0.70
4	10:00:00	12195.22131	8.38%	0.75
5	10:30:00	15270.90419	10.50%	0.94
6	11:00:00	13554.09684	9.32%	0.84
7	11:30:00	13068.62786	8.98%	0.81
8	12:00:00	9239.100372	6.35%	0.57
9	12:30:00	6035.936685	4.15%	0.37
10	13:00:00	5881.623278	4.04%	0.36
11	13:30:00	9598.590274	6.60%	0.59
12	14:00:00	8392.293395	5.77%	0.52
13	14:30:00	5376.155244	3.70%	0.33
14	15:00:00	4370.078104	3.00%	0.27
15	15:30:00	3528.771051	2.43%	0.22
16	16:00:00	2701.147924	1.86%	0.17
17	16:30:00	2103.707092	1.45%	0.13
18	17:00:00	1725.199276	1.19%	0.11
19	17:30:00	1451.655386	1.00%	0.09
20	18:00:00	1282.168982	0.88%	0.08
21	18:30:00	1162.975198	0.80%	0.07
22	19:00:00	1049.925973	0.72%	0.06

Bottle #	Time of Sample	Volume (CF)	% of Flow	Flow Weighted Volume*
23	19:30:00	969.0882669	0.67%	0.06
24	20:00:00	900.0791651	0.62%	0.06

**9 L Composite Sample*

SITE #4684

Due to the inability of the sampler to continue collecting samples, the three samples that were successfully retrieved were composited to prepare a single grab sample for water quality analysis. Flow data collected by the ISCO sampler does not accurately portray flow during the measured storm event, and thus has not been included in this analysis.

3.2 LABORATORY ANALYTICAL RESULTS

Samples were sent to Pace Analytical Services, Inc. lab in Huntersville, NC for analysis. Samples were analyzed for the following analytes:

Table 2: Analytical Parameters

Analyte	Analysis Method
Copper	EPA 200.7
Lead	EPA 200.7
Nickel	EPA 200.7
Zinc	EPA 200.7
Total Suspended Solids	SM 2540D
pH	EPA 9040
Ammonia	EPA 350.1 1993 Rev 2.0
Total Kjeldahl Nitrogen	EPA 351.2
Nitrate + Nitrite Nitrogen	EPA 353.2
Total Phosphorus	EPA 365.1
Chemical Oxygen Demand	SM 5220D

Table 3: Analytical results for each monitoring site.

	Analyte	Analyte Value[e]	Analyte Unit	Detection Limit	Exceedance Criterion
Manassas (#941)	Copper	0.5	µg/L	5.0	13[a]
	Lead	6.7	µg/L	5.0	120[a]
	Nickel	5.5	µg/L	5.0	180[a]
	Zinc	156.0	µg/L	10.0	120[a]
	Total Suspended Solids	35.3	mg/L	10.0	100[b]
	Nitrogen, Ammonia	ND	mg/L	0.10	
	Nitrogen, Kjeldahl, Total	0.94	mg/L	0.50	
	Nitrogen, NO^2 plus NO^3	0.67	mg/L	0.020	
	Total Nitrogen	1.61	mg/L	-	2.2[c]
	Phosphorus, Total	0.14	mg/L	0.050	2[b]
	Chemical Oxygen Demand	85.0	mg/L	25.0	120[b]
	pH	6.9	Std. Units	0.10	6.0-9.0[d]
Dale City (#4684)	Copper	19.2	µg/L	5.0	13[a]
	Lead	ND	µg/L	5.0	120[a]
	Nickel	26.4	µg/L	5.0	180[a]
	Zinc	111.0	µg/L	10.0	120[a]
	Total Suspended Solids	90.0	mg/L	10.0	100[b]
	Nitrogen, Ammonia	0.29	mg/L	0.10	
	Nitrogen, Kjeldahl, Total	1.8	mg/L	0.50	
	Nitrogen, NO^2 plus NO^3	0.26	mg/L	0.020	
	Total Nitrogen	2.35	mg/L	-	2.2[c]
	Phosphorus, Total	0.70	mg/L	0.050	2.0[b]
	Chemical Oxygen Demand	100	mg/L	25.0	120[b]
	pH	6.0	Std. Units	0.10	6.0-9.0[d]

[a]State Water Quality Control Board Acute Standards for Surface Water Quality. Value is based on an assumed hardness of 100mg/L.
[b]Based on benchmark criteria for the VPDES Industrial Stormwater General Permit.
[c]The sum of Nitrogen as Ammonia, NO^2, NO^3, and Total Kjeldahl Nitrogen.
[d]Based on numeric effluent limitations noted in the VPDES Permit for Discharge of Stormwater Associated with Industrial Activity.
[e]Values highlighted in red were found to be in exceedance of their respective criterion.

4.0 SUMMARY

A review of the data indicates that the discharge from both sites exceeded water quality criteria for one or more analytes. Zinc concentrations were reported to be 156 mg/L at Site #941, which is above the exceedance criterion of 120mg/L. Analysis of the discharge at Site #4684 indicated exceedances for Copper, and Total Nitrogen. It should be noted that the sample collected from Site #4684 was limited to a composite of the first three interval samples and the results do not represent a true EMC.

APPENDIX A

SITE CONDITIONS

Manassas (#941)

Site #941 is located within the Bull Run watershed. The outfall exhibited signs of recent repair, although there was some debris found in the pipe. There was less than 0.5 inch of water in the pipe when the ISCO sampler was deployed, but sampling was not initiated until the water exceeded 0.25 feet.

Following the storm event, the sampler was firmly in place with little disturbance to the rocks weighing down the sampling hose.

Dale City (#4684)

Site #4684 receives flow from Neabsco Mills Road and the Stonebridge at Potomac Town Center development. It is a 54" concrete pipe that drains to a deep scour pool before draining to a large BMP that collects drainage for the Potomac Club development.

Storm flow through the pipe dislodged the gravel bags holding the sample collection equipment in place. Future applications will rely on a mesh gravel bag to secure the equipment in place, as was used at Site #941. The first three samples were successfully collected by the ISCO sampler, spanning the first 1.5 hours of the storm event.

APPENDIX B

WATER QUALITY LABORATORY RESULTS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

September 30, 2016

Scott Hershberger
Amec Foster Wheeler
14424 Albemarle Point Place
Suite 115
Chantilly, VA 20151

RE: Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Dear Scott Hershberger:
Enclosed are the analytical results for sample(s) received by the laboratory on September 22, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92313314001	**DAL-091916**	Water	09/19/16 20:03	09/22/16 09:35
92313314002	**MAN-091916**	Water	09/19/16 19:56	09/22/16 09:35

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92313314001	**DAL-091916**	EPA 200.7	SH1	4	PASI-A
		SM 2540D	MJS	1	PASI-A
		EPA 9040	KDF1	1	PASI-A
		EPA 350.1 1993 Rev 2.0	AES2	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	MDW	1	PASI-A
		SM 5220D	MDW	1	PASI-A
92313314002	**MAN-091916**	EPA 200.7	SH1	4	PASI-A
		SM 2540D	MJS	1	PASI-A
		EPA 9040	KDF1	1	PASI-A
		EPA 350.1 1993 Rev 2.0	AES2	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	MDW	1	PASI-A
		SM 5220D	MDW	1	PASI-A

Pace Analytical Services, Inc.
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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Sample: DAL-091916 **Lab ID: 92313314001** Collected: 09/19/16 20:03 Received: 09/22/16 09:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper	**19.2**	ug/L	5.0	1	09/23/16 21:45	09/24/16 11:19	7440-50-8	
Lead	ND	ug/L	5.0	1	09/23/16 21:45	09/24/16 11:19	7439-92-1	
Nickel	**26.4**	ug/L	5.0	1	09/23/16 21:45	09/24/16 11:19	7440-02-0	
Zinc	**111**	ug/L	10.0	1	09/23/16 21:45	09/24/16 11:19	7440-66-6	
2540D TSS, Low-Level	Analytical Method: SM 2540D							
Total Suspended Solids	**90.0**	mg/L	10.0	1		09/23/16 10:55		
9040 pH	Analytical Method: EPA 9040							
pH	**6.0**	Std. Units	0.10	1		09/26/16 15:44		H6
350.1 Ammonia	Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	**0.29**	mg/L	0.10	1		09/29/16 13:03	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**1.8**	mg/L	0.50	1		09/24/16 02:34	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.26**	mg/L	0.020	1		09/29/16 19:23		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.70**	mg/L	0.050	1		09/28/16 20:38	7723-14-0	
5220D COD	Analytical Method: SM 5220D							
Chemical Oxygen Demand	**100**	mg/L	25.0	1		09/25/16 19:30		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Sample: MAN-091916 **Lab ID: 92313314002** Collected: 09/19/16 19:56 Received: 09/22/16 09:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper	**49.8**	ug/L	5.0	1	09/23/16 21:45	09/24/16 11:22	7440-50-8	
Lead	**6.7**	ug/L	5.0	1	09/23/16 21:45	09/24/16 11:22	7439-92-1	
Nickel	**5.5**	ug/L	5.0	1	09/23/16 21:45	09/24/16 11:22	7440-02-0	
Zinc	**156**	ug/L	10.0	1	09/23/16 21:45	09/24/16 11:22	7440-66-6	
2540D TSS, Low-Level	Analytical Method: SM 2540D							
Total Suspended Solids	**35.3**	mg/L	3.3	1		09/23/16 10:56		
9040 pH	Analytical Method: EPA 9040							
pH	**6.9**	Std. Units	0.10	1		09/26/16 15:44		H6
350.1 Ammonia	Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	ND	mg/L	0.10	1		09/29/16 13:05	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.94**	mg/L	0.50	1		09/27/16 22:54	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.67**	mg/L	0.020	1		09/29/16 19:24		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.14**	mg/L	0.050	1		09/28/16 20:39	7723-14-0	
5220D COD	Analytical Method: SM 5220D							
Chemical Oxygen Demand	**85.0**	mg/L	25.0	1		09/25/16 19:30		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 329967 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 92313314001, 92313314002

METHOD BLANK: 1828340 Matrix: Water
Associated Lab Samples: 92313314001, 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	5.0	09/24/16 12:44	
Lead	ug/L	ND	5.0	09/24/16 12:44	
Nickel	ug/L	ND	5.0	09/24/16 12:44	
Zinc	ug/L	ND	10.0	09/24/16 12:44	

LABORATORY CONTROL SAMPLE: 1828341

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	500	523	105	85-115	
Lead	ug/L	500	507	101	85-115	
Nickel	ug/L	500	502	100	85-115	
Zinc	ug/L	500	518	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828342 1828343

Parameter	Units	92313014001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	0.12 mg/L	500	500	623	624	101	101	70-130	0	20	
Lead	ug/L	ND	500	500	500	502	99	100	70-130	0	20	
Nickel	ug/L	0.0054 mg/L	500	500	494	496	98	98	70-130	0	20	
Zinc	ug/L	0.20 mg/L	500	500	702	703	100	100	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828344 1828345

Parameter	Units	92313051001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	0.036 mg/L	500	500	550	558	103	104	70-130	1	20	
Lead	ug/L	ND	500	500	484	484	97	97	70-130	0	20	
Nickel	ug/L	0.0067 mg/L	500	500	490	492	97	97	70-130	0	20	
Zinc	ug/L	2.0 mg/L	500	500	2430	2430	89	88	70-130	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330037 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 92313314001, 92313314002

METHOD BLANK: 1828565 Matrix: Water
Associated Lab Samples: 92313314001, 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	1.0	09/23/16 10:49	

LABORATORY CONTROL SAMPLE: 1828566

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	250	248	99	90-110	

SAMPLE DUPLICATE: 1828567

Parameter	Units	92312866002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 1828568

Parameter	Units	92313057001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	630	682	8	5	D6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330298 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 92313314001, 92313314002

SAMPLE DUPLICATE: 1830070

Parameter	Units	92311967001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.0	6.0	2	9	H6

SAMPLE DUPLICATE: 1830071

Parameter	Units	92313159001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	12.0	12.0	0	9	E,H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330706
QC Batch Method: EPA 350.1 1993 Rev 2.0
Analysis Method: EPA 350.1 1993 Rev 2.0
Analysis Description: 350.1 Ammonia
Associated Lab Samples: 92313314001, 92313314002

METHOD BLANK: 1832167 Matrix: Water
Associated Lab Samples: 92313314001, 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	09/29/16 12:53	

LABORATORY CONTROL SAMPLE: 1832168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1832169 1832170

Parameter	Units	92313274001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	5.0	5.0	99	100	90-110	1	7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1832171 1832172

Parameter	Units	92312086001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	5.1	5.1	102	101	90-110	0	7	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330093
QC Batch Method: EPA 351.2
Analysis Method: EPA 351.2
Analysis Description: 351.2 TKN
Associated Lab Samples: 92313314001

METHOD BLANK: 1828908
Matrix: Water
Associated Lab Samples: 92313314001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	09/24/16 02:20	

LABORATORY CONTROL SAMPLE: 1828909

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.1	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828910 1828911

Parameter	Units	92313253006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	1.2	10	10	11.3	11.3	102	101	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330230 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92313314002

METHOD BLANK: 1829762 Matrix: Water
Associated Lab Samples: 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	09/27/16 22:52	

LABORATORY CONTROL SAMPLE: 1829763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.6	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1829764 1829765

Parameter	Units	92313314002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.94	10	10	11.0	10.8	100	98	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1829766 1829767

Parameter	Units	92313536003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	2.3	10	10	12.2	9.4	98	71	90-110	26	10	M1,R1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330905
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92313314001, 92313314002

METHOD BLANK: 1833435 Matrix: Water
Associated Lab Samples: 92313314001, 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	09/29/16 18:59	

LABORATORY CONTROL SAMPLE: 1833436

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1833437 1833438

Parameter	Units	92313298011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.2	2.5	2.5	3.5	3.5	91	91	75-125	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1833439 1833440

Parameter	Units	92313298021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.098	2.5	2.5	2.7	2.7	105	105	75-125	0	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330409 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92313314001, 92313314002

METHOD BLANK: 1830682 Matrix: Water
Associated Lab Samples: 92313314001, 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/28/16 20:31	

LABORATORY CONTROL SAMPLE: 1830683

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1830684 1830685

Parameter	Units	92313207001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	36.9	2.5	2.5	40.0	39.8	124	115	90-110	1	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1830686 1830687

Parameter	Units	92312899001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	2.4	2.5	2.5	5.0	5.0	102	102	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

QC Batch: 330146 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD
Associated Lab Samples: 92313314001, 92313314002

METHOD BLANK: 1829518 Matrix: Water
Associated Lab Samples: 92313314001, 92313314002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	25.0	09/25/16 19:30	

LABORATORY CONTROL SAMPLE: 1829519

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	750	752	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1829520 1829521

Parameter	Units	92313314001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	100	750	750	850	852	100	100	90-110	0	3	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1829522 1829523

Parameter	Units	92312993002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	1320	750	750	2180	2180	113	113	90-110	0	3	M6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92313314

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92313314001	**DAL-091916**	EPA 200.7	329967	EPA 200.7	330194
92313314002	**MAN-091916**	EPA 200.7	329967	EPA 200.7	330194
92313314001	**DAL-091916**	SM 2540D	330037		
92313314002	**MAN-091916**	SM 2540D	330037		
92313314001	**DAL-091916**	EPA 9040	330298		
92313314002	**MAN-091916**	EPA 9040	330298		
92313314001	**DAL-091916**	EPA 350.1 1993 Rev 2.0	330706		
92313314002	**MAN-091916**	EPA 350.1 1993 Rev 2.0	330706		
92313314001	**DAL-091916**	EPA 351.2	330093		
92313314002	**MAN-091916**	EPA 351.2	330230		
92313314001	**DAL-091916**	EPA 353.2	330905		
92313314002	**MAN-091916**	EPA 353.2	330905		
92313314001	**DAL-091916**	EPA 365.1	330409		
92313314002	**MAN-091916**	EPA 365.1	330409		
92313314001	**DAL-091916**	SM 5220D	330146		
92313314002	**MAN-091916**	SM 5220D	330146		

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised:April 25, 2016 Page 1 of 2
	Document No.: F-CHR-CS-003-rev.19	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: AMEC **Project #**

WO# : 92313314

92313314

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____

Thermometer: T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on Ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 2.1 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Date/Initials Person Examining Contents: DM 9/22

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNO3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12 NaOH/ZnOAc pH>9
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	
Samples checked for dechlorination?	☐ Yes	☑ No	☐ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	12.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	13.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ **Date/Time:** _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: JD **Date:** 9/23/16

Project Manager SRF Review: JD **Date:** 9/23/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Amec Foster Wheeler, Va	Report To:	Green, Ben	Attention:	Jen Furey
Address:	14424 Albemarle Point Place	Copy To:	jen.furey@amecfw.com	Company Name:	Amec Foster Wheeler
	Suite 115, Chantilly, VA 20151			Address:	SAME
Email:	Benjamin.green@amecfw.com	Purchase Order #:	60122085 18	Pace Quote:	
Phone:	703-488-3795 Fax	Project Name:	Prince William Co Stormwater	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:	Standard TAT	Project #:	15127c004.0002	Pace Profile #:	8125-1

Regulatory Agency	
State / Location	VA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	pH	200.7 Metals (Zn,Cu,Pb,Ni)	TSS	Ammonia,COD,Phosphorus	TKN+nitrate+nitrite	Residual Chlorine (Y/N)	9.23.13 SM
1	DAL-091916	WT	G	9/19	08:33	9/19	20:03		5	2	2	1							X	X	X	X	X			001
2	MAN-091916	WT	G	9/19	08:26	9/19	19:56		5	2	2	1							X	X	X	X	X			002
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ben Green/AmecFW	9/19	6pm	FedEx	9/19	6pm
				Omaha/PaceHK	9.22.16	935

SAMPLE CONDITIONS			
2.1	4	Y	Y

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	Benjamin Green
SIGNATURE of SAMPLER:	DATE Signed: 9/21/2016

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Wet Weather Monitoring Report

Fourth Quarter, Winter 2016

Prepared for:

Prince William County Department of Public Works
5 County Complex Court, Suite 170
Prince William, Virginia 22192

Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
11424 Albemarle Point Place, Suite 115
Chantilly, VA 20151
(703) 488-3700

March 9, 2017
Project No. 151270004

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is pleased to provide this report of wet weather monitoring for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Municipal Separate Storm Sewer System (MS4) Permit (Number VA0088595), issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. This report discusses the results of the Q4 sampling event completed during December of 2016, as well as the findings from the water quality analysis results of that sampling event.

2.0 METHODS

Flow rate data were collected at the outfalls by an ISCO 6712 automated sampler coupled with an ISCO 730 bubbler flow module. Flow rate over the course of the sampling event was electronically calculated using ISCO Flowlink 5.1 software, which utilizes the Manning Equation to convert flow level and velocity to flow rate.

SITE #941; MANASSAS, VA

Site #941 is located near 11850 Livingston Road. The site receives a total of 52 acres of upstream drainage area from a land surface that is 34% impervious. Further evaluation of County data revealed that the pipe is 54 inches in diameter with a slope of 0.002593. There has consistently been a low level of water in the pipe, as it at the same elevation of an adjacent stormwater pond.

SITE #4684; DALE CITY, VA

Site #4684 is located near the corner of Potomac Center Blvd. and Sheffield Way, at 2425 Brookmore Lane. It drains into a BMP for the Potomac Club residential development. Upstream drainage totaled 51 acres, 21% of which is from impervious surfaces. The pipe is 54 inches in diameter with a slope of 1.582.

The automated samplers were deployed when a qualifying storm event (>0.3 inches precipitation) was forecast for the two monitoring sites. On December 9, Amec Foster Wheeler staff deployed the samplers at both field sites and programmed the samplers' automated, discrete sampling sequence to initiate upon flow levels exceeding two inches. The samplers were programmed to collect 24 discrete 1L samples to be collected every 30 minutes over a 12 hour duration. Rain gage data were compiled for monitoring stations in the Weather Underground monitoring network. The data were easily accessible online, and provided hourly precipitation totals over the monitoring period. Gages were prioritized based on the makeup of the data record (reporting interval) and proximity to monitoring locations. Due to technical difficulties encountered with the sampler, a follow up collection was completed on December 17 at Site #941.

Following the storm event, staff retrieved the samples and prepared them for shipment to Pace Environmental for water quality analysis. In order to compile the 24 discrete samples into a single flow-weighted composite, discharge was calculated within the Flowlink software using the Manning Equation:

$$Q = VA = \left(\frac{1.49}{n}\right) A R^{\frac{2}{3}} \sqrt{S} \text{ [US]}$$

Q = Flow rate
A = Flow area
V = Avg. velocity
S = Water surface slope
R = Hydraulic Radius
n = Roughness coefficient
1.49 = English units conversion factor

Channel slopes were determined using invert elevations reported in the stormwater infrastructure geospatial data provided by Prince William County. Using flow levels reported by the ISCO samplers, the area and hydraulic radius inside the sampled outfalls could be computed for a given time interval. A Manning's *n value* of 0.013 was assumed for the concrete pipes. Discrete samples collected over the duration of the storm event were then mixed based on their representative weight within the cumulative flow curve for each storm event. This flow weighted composite sample was provided to the laboratory for analysis. The resulting analysis is considered the event mean concentration (EMC) of the individual analyte.

3.0 RESULTS

SITE #941

Sampling occurred from 11:30am to 11:00pm on December 17, 2016. The samples were collected during a different storm event than the samples at Site #4684 due to technical difficulties encountered with the sampler battery. Precipitation data recorded at Dulles International Airport (KIAD) totaled 0.26 inches from 04:00am – 10:00am, with no precipitation recorded during the corresponding sampling period. The precipitation consisted of light freezing rain. Temperatures ranged from 27.0 – 28.0 degrees F during the Dulles precipitation event, and 30.9 – 51.1 degrees F during the time of sample collection at the site. The previously recorded event at this gage occurred on December 12. All 24 of the discrete samples were subsequently retrieved.

SITE #4684

Sampling occurred from 6:00am to 11:00am on December 12, 2016. Precipitation data recorded at Ft. Belvoir, VA (KVAALEXA115) measured 0.2 inches of total accumulation over the recorded storm event, with accumulation occurring from 05:00am – 06:30am. Temperatures ranged from 42.1 – 46.6 degrees F over the sample collection period. The previously measured rain event at this gage occurred on December 6. Due to technical difficulties encountered with the sampler battery, the full storm even was not captured. Thus, only 11 of the anticipated 24 samples were successfully collected by the ISCO sampler, covering the first 5.5 hours of the storm event.

3.1 FLOW DATA

SITE #941

Flow ranged from 0.28 to 1.77 cfs. The storm event hydrograph compared with cumulative volume can be seen in **Figure 1**. **Table 1** lists the proportion of each sample mixed with the flow-weighted composite.

Figure 1: Flow data over time for the storm event at Site #941 on December 17, 2016.

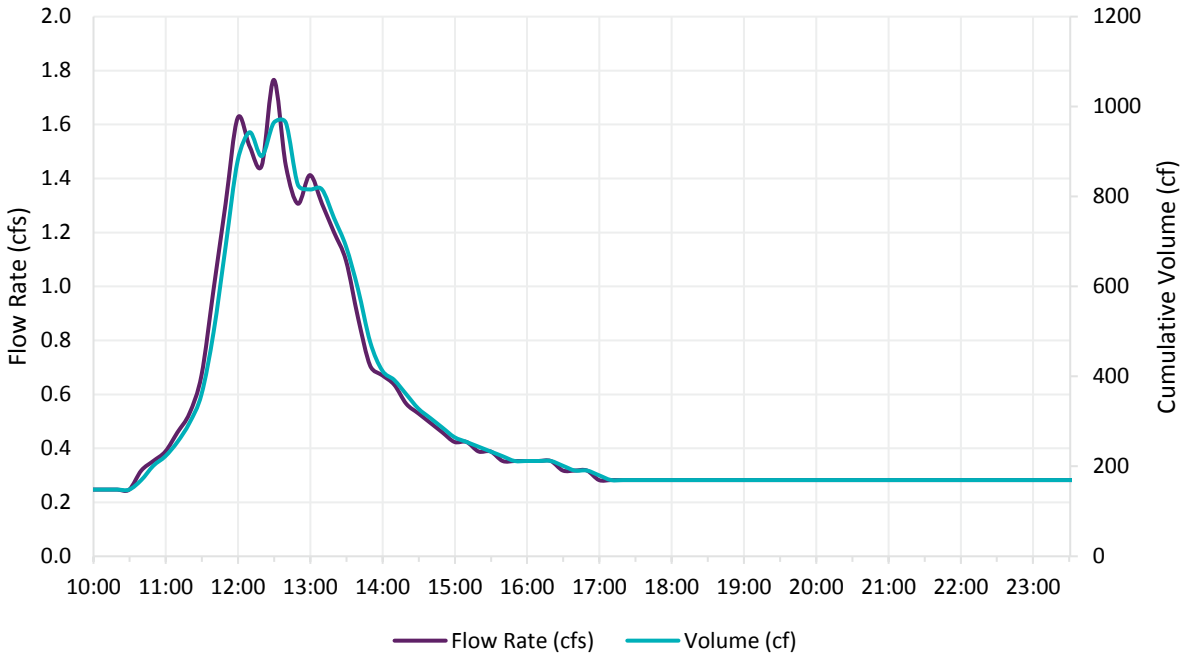


Table 1: Summary of Flow Weighted Composite – Site #941

Bottle #	Time of Sample	Volume (cf)	% of Flow	Flow Weighted Volume (L)*
1	11:35	0.9888	7.98	0.48
2	12:04	1.5185	12.25	0.74
3	12:34	1.4479	11.68	0.70
4	13:04	1.3066	10.54	0.63
5	13:34	0.8829	7.12	0.43
6	14:04	0.6357	5.13	0.31
7	14:34	0.4944	3.99	0.24
8	15:04	0.4238	3.42	0.21
9	15:34	0.3531	2.85	0.17
10	16:04	0.3531	2.85	0.17
11	16:34	0.3178	2.56	0.15
12	17:04	0.2825	2.28	0.14
13	17:34	0.2825	2.28	0.14
14	18:04	0.2825	2.28	0.14
15	18:34	0.2825	2.28	0.14
16	19:04	0.2825	2.28	0.14
17	19:34	0.2825	2.28	0.14
18	20:04	0.2825	2.28	0.14
19	20:34	0.2825	2.28	0.14
20	21:04	0.2825	2.28	0.14
21	21:34	0.2825	2.28	0.14
22	22:04	0.2825	2.28	0.14
23	22:34	0.2825	2.28	0.14
24	23:04	0.2825	2.28	0.14

**6.0 L Sample*

SITE #4684

Flow ranged from 1.06 to 10.3 cfs. The storm event hydrograph compared with cumulative volume can be seen in **Figure 2**. **Table 2** lists the proportion of each sample mixed with the flow-weighted composite.

Figure 2: Flow data over time for the storm event at Site #4684 on December 12, 2016.

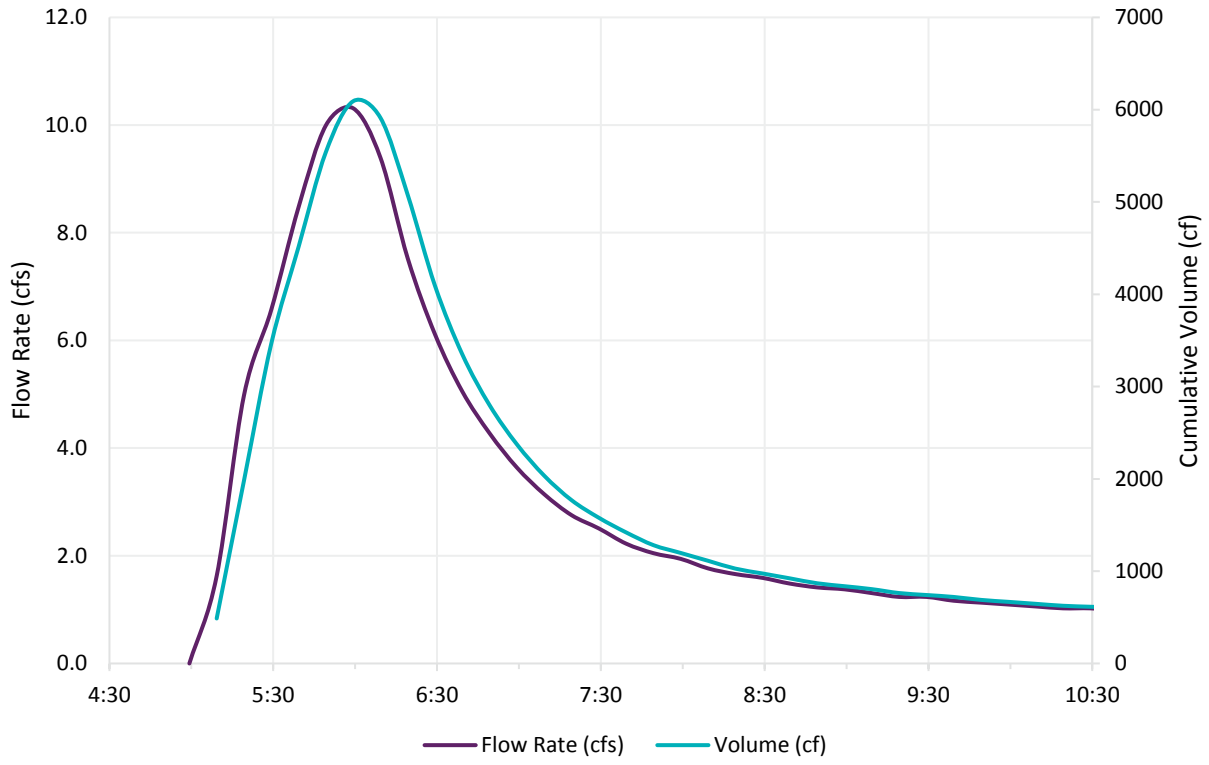


Table 2: Summary of Flow Weighted Composite – Site #4684

Bottle #	Time of Sample	Volume (cf)	% of Flow	Flow Weighted Volume (L)*
1	5:04	487.3429	2.22	0.08
2	5:33	4513.219	20.59	0.72
3	6:03	5911.681	26.97	0.94
4	6:33	3347.834	15.27	0.53
5	7:03	2034.127	9.28	0.32
6	7:33	1419.651	6.48	0.23
7	8:03	1112.413	5.07	0.18
8	8:33	921.7137	4.20	0.15
9	9:03	805.1752	3.67	0.13
10	9:33	720.4199	3.29	0.12
11	10:03	646.259	2.95	0.10

**3.5 L Sample*

3.2 LABORATORY ANALYTICAL RESULTS

Samples were sent to Pace Analytical Services, Inc. lab in Huntersville, NC for analysis, with Analytical Parameters tested listed in **Table 3**.

Table 3: Analytical Parameters

Analyte	Analysis Method
Copper	EPA 200.7
Lead	EPA 200.7
Nickel	EPA 200.7
Zinc	EPA 200.7
Total Suspended Solids	SM 2540D
pH	EPA 9040
Ammonia	EPA 350.1 1993 Rev 2.0
Total Kjeldahl Nitrogen	EPA 351.2
Nitrate + Nitrite Nitrogen	EPA 353.2
Total Phosphorus	EPA 365.1
Chemical Oxygen Demand	SM 5220D

Table 4: Analytical results for both monitoring sites

	Analyte	Analyte Value	Analyte Unit	Detection Limit	Exceedance Criterion	Criterion Basis
Manassas (#941)	Copper	36.30	µg/L	5	13	a
	Lead	5.80	µg/L	5	120	a
	Nickel	5.30	µg/L	5	180	a
	Zinc	109.00	µg/L	10	120	a
	Total Suspended Solids	38.80	mg/L	10	100	b
	Nitrogen, Ammonia	0.40	mg/L	0.1		-
	Nitrogen, Kjeldahl, Total	1.30	mg/L	0.5		-
	Nitrogen, NO2 plus NO3	0.77	mg/L	0.02		-
	Total Nitrogen	2.07	mg/L	-	2.2	c
	Phosphorus, Total	0.210	mg/L	0.05	2	b
	Chemical Oxygen Demand	145.0	mg/L	25	120	b
	pH	7.1	Std. Units	0.1	6.0-9.0	d
Dale City (#4684)	Copper	8.30	µg/L	5	13	a
	Lead	ND	µg/L	5	120	a
	Nickel	ND	µg/L	5	180	a
	Zinc	67.70	µg/L	10	120	a
	Total Suspended Solids	9.50	mg/L	10	100	b
	Nitrogen, Ammonia	0.25	mg/L	0.1		-
	Nitrogen, Kjeldahl, Total	0.59	mg/L	0.5		-
	Nitrogen, NO2 plus NO3	2.50	mg/L	0.02		-
	Total Nitrogen	3.09	mg/L	-	2.2	c
	Phosphorus, Total	0.057	mg/L	0.05	2	b
	Chemical Oxygen Demand	26.0	mg/L	25	120	b
	pH	2.8	Std. Units	0.1	6.0-9.0	d

Values highlighted in red were found to be in exceedance of their respective criterion.

[a]State Water Quality Control Board Acute Standards for Surface Water Quality. Value is based on an assumed hardness of 100mg/L.
[b]Based on benchmark criteria for the VPDES Industrial Stormwater General Permit.
[c]The sum of Nitrogen as Ammonia, NO^2, NO^3, and Total Kjeldahl Nitrogen.
[d]Based on numeric effluent limitations noted in the VPDES Permit for Discharge of Stormwater Associated with Industrial Activity.

4.0 SUMMARY

A review of the data indicates that the discharge from both sites exceeded water quality criteria for one or more analytes. As indicated in **Table 4**, noted exceedances occurred at Site #941 for Chemical Oxygen Demand (145.0 mg/L) and Copper (36.30 µg/L), and at Site #4684 for Total Nitrogen (3.09 mg/L) and pH (2.8). This was the second consecutive sampling where Site #4684 was in exceedance for Total Nitrogen. The pH value was confirmed with Pace after review of their internal records. For water quality sample analysis, pH does not have a hold time established due to its ease of influence from temperature and other environmental conditions. As an extra QC measure, Amec Foster Wheeler will conduct spot testing of pH values for samples at the time of collection.

APPENDIX A

SITE CONDITIONS

Manassas (#941)

Site #941 is located within the Bull Run watershed. The outfall exhibited signs of recent repair, although there was some debris found in the pipe. There was less than 0.5 inch of water in the pipe when the ISCO sampler was deployed, but sampling was not initiated until the water exceeded two inches.

Following the storm event, the sampler was firmly in place with little disturbance to the rocks weighing down the sampling hose.

Dale City (#4684)

Site #4684 receives flow from Neabsco Mills Road and the Stonebridge at Potomac Town Center development. It is a 54" concrete pipe that drains to a deep scour pool before draining to a large BMP that collects drainage for the Potomac Club development. Amec Foster Wheeler staff noted that some areas surrounding the headwall/curtain were eroding away, likely requiring future maintenance.

Adjustments were made in the amount of weight used on the sampling installation. The sampling probe remained in place throughout the event. Storm flow through the pipe dislodged the gravel bags holding the sample collection equipment in place. Future applications will rely on a mesh gravel bag to secure the equipment in place, as was used at Site #941. The first three samples were successfully collected by the ISCO sampler, spanning the first 1.5 hours of the storm event.

APPENDIX B

WATER QUALITY LABORATORY RESULTS

Wet Weather Monitoring Report

First Quarter 2017 (January 1 – March 31, 2017)
Event Date: February 9, 2017

Prepared for:

Prince William County Department of Public Works
5 County Complex Court, Suite 170
Prince William, Virginia 22192

Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
11424 Albemarle Point Place, Suite 115
Chantilly, VA 20151
(703) 488-3700

February 23, 2017
Project No. 151270004

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is pleased to provide this report of wet weather monitoring for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Municipal Separate Storm Sewer System (MS4) Permit (Number VA0088595), issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. This report discusses the results of the Q1 sampling event conducted during February 9, 2017, as well as the findings from the water quality analysis results of that sampling event.

2.0 METHODS

Flow rate data were collected at the outfalls by an ISCO 6712 automated sampler coupled with an ISCO 730 bubbler flow module. Flow rate over the course of the sampling event was electronically calculated using ISCO Flowlink 5.1 software, which utilizes the Manning Equation to convert flow level and velocity to flow rate.

SITE #941; MANASSAS, VA

Site #941 is located near 11850 Livingston Road. The site receives a total of 52 acres of upstream drainage area from a land surface that is 34% impervious. Further evaluation of County data revealed that the pipe is 54 inches in diameter with a slope of 0.002593. There has consistently been a low level of water in the pipe, as it at the same elevation of an adjacent stormwater pond.

SITE #4684; DALE CITY, VA

Site #4684 is located near the corner of Potomac Center Blvd. and Sheffield Way, at 2425 Brookmore Lane. It drains into a BMP for the Potomac Club residential development. Upstream drainage totaled 51 acres, 21% of which is from impervious surfaces. The pipe is 54 inches in diameter with a slope of 1.582.

The automated samplers were deployed when a qualifying storm event (>0.3 inches precipitation) was forecast for the two monitoring sites. On February 8, Amec Foster Wheeler staff deployed the samplers at both field sites and programmed the samplers' automated, discrete sampling sequence to initiate upon flow levels exceeding two inches. The samplers were programmed to collect 24 discrete 1L samples to be collected every 30 minutes over a 12 hour duration. Rain gage data were compiled for monitoring stations in the Weather Underground monitoring network. The data were easily accessible online, and provided hourly precipitation totals over the monitoring period. Gages were prioritized based on the makeup of the data record (reporting interval) and proximity to monitoring locations.

Following the storm event, staff retrieved the samples and prepared them for shipment to Pace Environmental for water quality analysis. In order to compile the 24 discrete samples into a single flow-weighted composite, discharge was calculated within the Flowlink software using the Manning Equation:

$$Q = VA = \left(\frac{1.49}{n}\right) A R^{\frac{2}{3}} \sqrt{S} \text{ [US]}$$

Q = Flow rate
A = Flow area
V = Avg. velocity
S = Water surface slope
R = Hydraulic Radius
n = Roughness coefficient
1.49 = English units conversion factor

Channel slopes were determined using invert elevations reported in the stormwater infrastructure geospatial data provided by Prince William County. Using flow levels reported by the ISCO samplers, the area and hydraulic radius inside the sampled outfalls could be computed for a given time interval. A Manning's *n* value of 0.013 was assumed for the concrete pipes. Discrete samples collected over the duration of the storm event were then mixed based on their representative weight within the cumulative flow curve for each storm event. This flow weighted composite sample was provided to the laboratory for analysis. The resulting analysis is considered the event mean concentration (EMC) of the individual analyte.

3.0 RESULTS

SITE #941

Sampling occurred from 03:00am to 10:00am on February 9, 2016. Precipitation data recorded at Dulles International Airport (KIAD) totaled 0.36 inches from 02:00am – 06:00am. The precipitation consisted of rain and light snow. Temperatures ranged from 34.0 – 51.1 degrees F during the Dulles precipitation event. The previously recorded event at this gage occurred from 02:00am – 08:00am on February 7, which totaled than 0.01 inches of precipitation. Due to technical difficulties encountered with the sampler battery, the full storm event was not fully captured. Thus, only 15 of the anticipated 24 samples were successfully collected by the ISCO sampler, covering the first seven hours of the storm event.

SITE #4684

Sampling occurred from 03:30am to 07:30am on February 9, 2017. Precipitation data recorded at Ft. Belvoir, VA (KDAA) totaled 0.16 inches from 01:00am – 08:00am. The precipitation consisted primarily of rain. Temperatures ranged from 37.4 – 52 degrees F over the sample collection period. The previously measured rain event at this gage occurred during a light snow event on January 30. Due to technical difficulties encountered with the sampler battery, the full storm event was not fully captured. Thus, only nine of the anticipated 24 samples were successfully collected by the ISCO sampler, covering the first four hours of the storm event.

3.1 FLOW DATA

SITE #941

Flow ranged from 1.23 – 10.52 cfs. The storm event hydrograph compared with cumulative volume can be seen in **Figure 1**. **Table 1** lists the proportion of each sample mixed with the flow-weighted composite.

Figure 1: Flow data over time for the storm event at Site #941 on February 9, 2017.

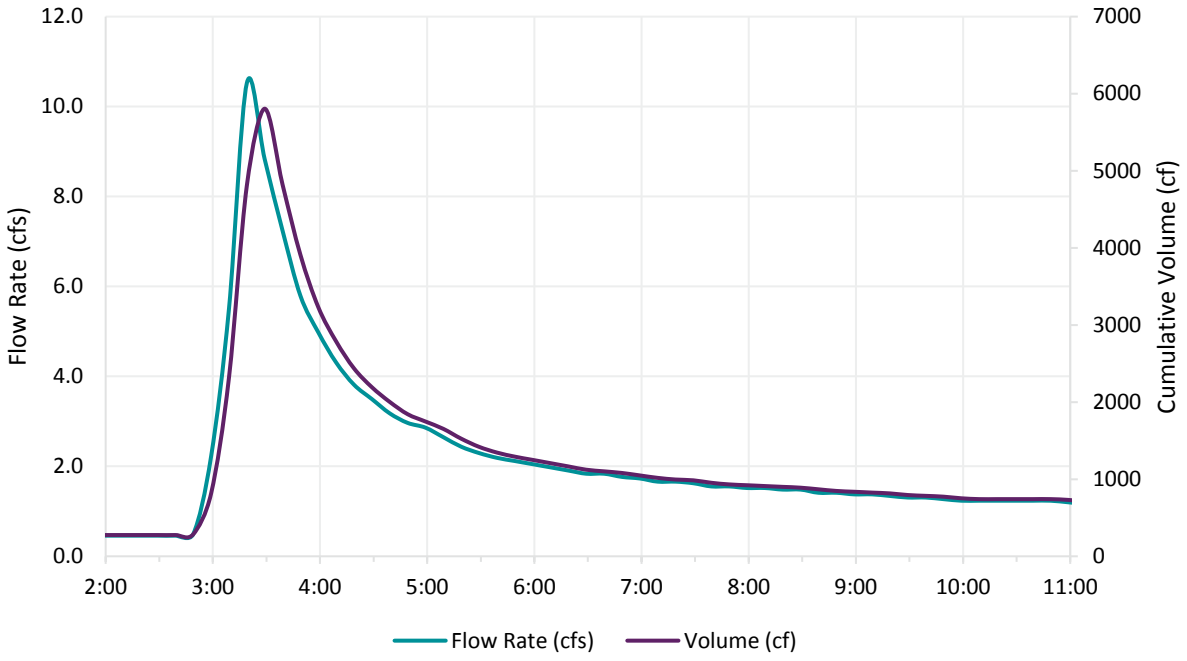


Table 1: Summary of Flow Weighted Composite – Site #941

Bottle #	Time of Sample	Volume (cf)	% of Flow	Flow Weighted Volume (L)*
1	3:00	815.76957	3.43	0.14
2	3:30	5805.73668	24.38	0.98
3	4:00	3231.29505	13.57	0.54
4	4:30	2193.04287	9.21	0.37
5	5:00	1748.07765	7.34	0.29
6	5:30	1419.65094	5.96	0.24
7	6:00	1250.14038	5.25	0.21
8	6:30	1123.00746	4.72	0.19
9	7:00	1048.84659	4.40	0.18
10	7:30	985.28013	4.14	0.17
11	8:00	921.71367	3.87	0.15
12	8:30	889.93044	3.74	0.15
13	9:00	836.95839	3.51	0.14
14	9:30	794.58075	3.34	0.13
15	10:00	752.20311	3.16	0.13

**4.0 L Sample*

SITE #4684

Flow ranged from 0.84 – 6.14 cfs. The storm event hydrograph compared with cumulative volume can be seen in **Figure 2**. **Table 2** lists the proportion of each sample mixed with the flow-weighted composite.

Figure 2: Flow data over time for the storm event at Site #4684 on February 9, 2017.

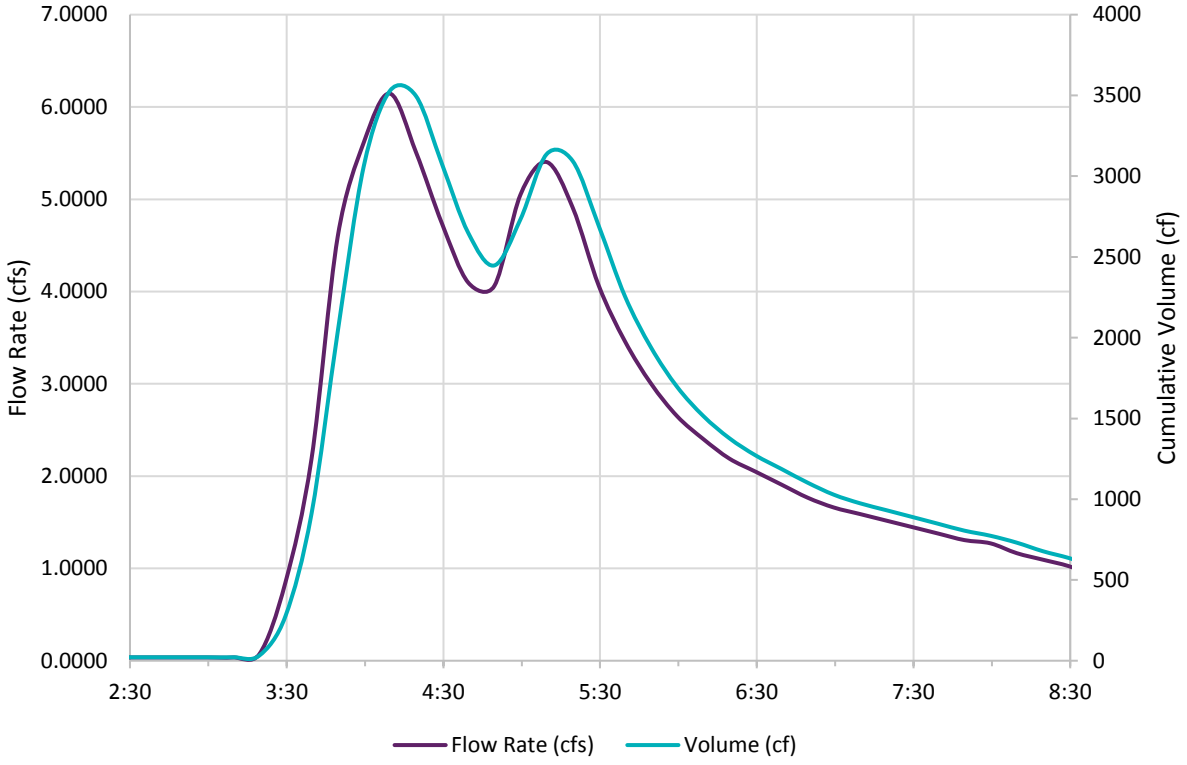


Table 2: Summary of Flow Weighted Composite – Site #4684

Bottle #	Time of Sample	Volume (cf)	% of Flow	Flow Weighted Volume (L)*
1	3:30	275.4547	1.65	0.09
2	4:00	3061.784	18.31	0.96
3	4:30	3072.379	18.38	0.96
4	5:00	2733.358	16.35	0.86
5	5:30	2690.98	16.10	0.85
6	6:00	1695.106	10.14	0.53
7	6:30	1271.329	7.60	0.40
8	7:00	1027.658	6.15	0.32
9	7:30	889.9304	5.32	0.28

**5.25 L Sample*

3.2 LABORATORY ANALYTICAL RESULTS

Samples were sent to Pace Analytical Services, Inc. lab in Huntersville, NC for analysis, with Analytical Parameters tested listed in **Table 3**.

Table 3: Analytical Parameters

Analyte	Analysis Method
Copper	EPA 200.7
Lead	EPA 200.7
Nickel	EPA 200.7
Zinc	EPA 200.7
Total Suspended Solids	SM 2540D
pH	EPA 9040
Ammonia	EPA 350.1 1993 Rev 2.0
Total Kjeldahl Nitrogen	EPA 351.2
Nitrate + Nitrite Nitrogen	EPA 353.2
Total Phosphorus	EPA 365.1
Chemical Oxygen Demand	SM 5220D

	Analyte	Analyte Value	Analyte Unit	Detection Limit	Exceedance Criterion	Criterion Basis
Manassas (#941)	Copper	64.00	µg/L	5	13	a
	Lead	16.90	µg/L	5	120	a
	Nickel	8.40	µg/L	5	180	a
	Zinc	423.00	µg/L	10	120	a
	Total Suspended Solids	90.00	mg/L	10	100	b
	Nitrogen, Ammonia	0.29	mg/L	0.1		-
	Nitrogen, Kjeldahl, Total	0.98	mg/L	0.5		-
	Nitrogen, NO2 plus NO3	1.00	mg/L	0.02		-
	Total Nitrogen	1.98	mg/L	-	2.2	c
	Phosphorus, Total	0.180	mg/L	0.05	2	b
	Chemical Oxygen Demand	106.0	mg/L	25	120	b
	pH	7.0	Std. Units	0.1	6.0-9.0	d
Dale City (#4684)	Copper	33.10	µg/L	5	13	a
	Lead	ND	µg/L	5	120	a
	Nickel	5.30	µg/L	5	180	a
	Zinc	299.00	µg/L	10	120	a
	Total Suspended Solids	39.00	mg/L	10	100	b
	Nitrogen, Ammonia	0.64	mg/L	0.1		-
	Nitrogen, Kjeldahl, Total	1.50	mg/L	0.5		-
	Nitrogen, NO2 plus NO3	0.76	mg/L	0.02		-
	Total Nitrogen	2.26	mg/L	-	2.2	c
	Phosphorus, Total	0.110	mg/L	0.05	2	b
	Chemical Oxygen Demand	93.0	mg/L	25	120	b
	pH	6.4	Std. Units	0.1	6.0-9.0	d

[a]State Water Quality Control Board Acute Standards for Surface Water Quality. Value is based on an assumed hardness of 100mg/L.
[b]Based on benchmark criteria for the VPDES Industrial Stormwater General Permit.
[c]The sum of Nitrogen as Ammonia, NO^2, NO^3, and Total Kjeldahl Nitrogen.
[d]Based on numeric effluent limitations noted in the VPDES Permit for Discharge of Stormwater Associated with Industrial Activity.
[e]Values highlighted in red were found to be in exceedance of their respective criterion.

4.0 SUMMARY

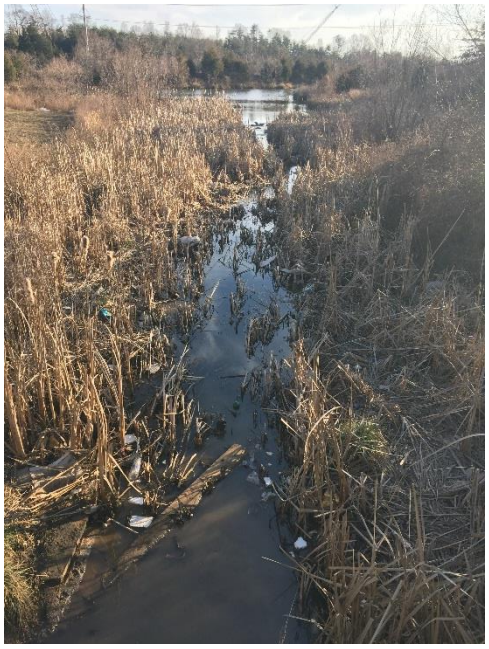
A review of the data indicates that the discharge from both sites exceeded water quality criteria for multiple analytes. As indicated in **Table 3,** noted exceedances occurred at both sites for Copper (64.0, 33.1 µg/L respectively) and Zinc (423, 290 µg/L respectively), while Site #4684 also experienced an exceedance for Total Nitrogen (2.26 mg/L) – the third consecutive sampling where this site has been in exceedance for TN.

APPENDIX A

SITE CONDITIONS

Manassas (#941)

Site #941 is located within the Bull Run watershed. It receives drainage from an industrial use area and parking lots with frequent truck traffic. The outfall exhibited signs of recent repair, but some cracks are evident. There was less than 0.5 inch of water in the pipe when the ISCO sampler was deployed, but sampling was not initiated until the water exceeded two inches. Sediment is accumulating within the channel leading from the outfall at an increasing rate, although it is uncertain how this may change in the warmer season.



Following the storm event, the sampler was firmly in place with little disturbance to the rocks weighing down the sampling hose.

Dale City (#4684)

Site #4684 receives flow from Neabsco Mills Road and the Stonebridge at Potomac Town Center development. It is a 54" concrete pipe that drains to a deep scour pool before draining to a large BMP that collects drainage for the Potomac Club development. Erosion around the outfall apron is continuing, and will likely require future maintenance. An oily sheen was noted in the scour pool prior to the storm event. There was no standing water noted in the pipe.

Following the storm event, the sampler was firmly in place with little disturbance to the rocks weighing down the sampling hose.

APPENDIX B

WATER QUALITY LABORATORY RESULTS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

February 16, 2017

Jen Furey
Amec Foster Wheeler
14424 Albemarle Point Place
Suite 115
Chantilly, VA 20151

RE: Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Dear Jen Furey:
Enclosed are the analytical results for sample(s) received by the laboratory on February 10, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92329486001	**0209 DAL**	Water	02/09/17 07:30	02/10/17 09:55
92329486002	**0209 MAN**	Water	02/09/17 07:30	02/10/17 09:55

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92329486001	**0209 DAL**	EPA 200.7	SH1	4	PASI-A
		SM 2540D	MLS	1	PASI-A
		EPA 9040	ALC	1	PASI-A
		EPA 350.1 1993 Rev 2.0	BRJ	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	WRC	1	PASI-A
		EPA 365.1	MDW	1	PASI-A
		SM 5220D	MDW	1	PASI-A
92329486002	**0209 MAN**	EPA 200.7	SH1	4	PASI-A
		SM 2540D	MLS	1	PASI-A
		EPA 9040	ALC	1	PASI-A
		EPA 350.1 1993 Rev 2.0	BRJ	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	WRC	1	PASI-A
		EPA 365.1	MDW	1	PASI-A
		SM 5220D	MDW	1	PASI-A

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Sample: 0209 DAL **Lab ID: 92329486001** Collected: 02/09/17 07:30 Received: 02/10/17 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper	**33.1**	ug/L	5.0	1	02/13/17 23:05	02/15/17 16:45	7440-50-8	
Lead	ND	ug/L	5.0	1	02/13/17 23:05	02/15/17 16:45	7439-92-1	
Nickel	**5.3**	ug/L	5.0	1	02/13/17 23:05	02/15/17 16:45	7440-02-0	
Zinc	**299**	ug/L	10.0	1	02/13/17 23:05	02/15/17 16:45	7440-66-6	
2540D TSS, Low-Level	Analytical Method: SM 2540D							
Total Suspended Solids	**39.0**	mg/L	2.0	1		02/12/17 11:45		
9040 pH	Analytical Method: EPA 9040							
pH	**6.4**	Std. Units	0.10	1		02/15/17 14:07		H6
350.1 Ammonia	Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	**0.64**	mg/L	0.10	1		02/15/17 02:43	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**1.5**	mg/L	0.50	1		02/16/17 02:34	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.76**	mg/L	0.020	1		02/15/17 18:50		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.11**	mg/L	0.050	1		02/14/17 01:10	7723-14-0	
5220D COD	Analytical Method: SM 5220D							
Chemical Oxygen Demand	**93.0**	mg/L	25.0	1		02/14/17 22:34		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Sample: 0209 MAN **Lab ID: 92329486002** Collected: 02/09/17 07:30 Received: 02/10/17 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper	**64.0**	ug/L	5.0	1	02/13/17 23:05	02/15/17 16:04	7440-50-8	
Lead	**16.9**	ug/L	5.0	1	02/13/17 23:05	02/15/17 16:04	7439-92-1	
Nickel	**8.4**	ug/L	5.0	1	02/13/17 23:05	02/15/17 16:04	7440-02-0	
Zinc	**423**	ug/L	10.0	1	02/13/17 23:05	02/15/17 16:04	7440-66-6	
2540D TSS, Low-Level	Analytical Method: SM 2540D							
Total Suspended Solids	**90.0**	mg/L	4.0	1		02/12/17 11:42		
9040 pH	Analytical Method: EPA 9040							
pH	**7.0**	Std. Units	0.10	1		02/15/17 14:07		H6
350.1 Ammonia	Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	**0.29**	mg/L	0.10	1		02/15/17 02:44	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.98**	mg/L	0.50	1		02/16/17 02:35	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.0**	mg/L	0.020	1		02/15/17 18:51		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.18**	mg/L	0.050	1		02/14/17 01:11	7723-14-0	
5220D COD	Analytical Method: SM 5220D							
Chemical Oxygen Demand	**106**	mg/L	25.0	1		02/14/17 22:34		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348016 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1930955 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	5.0	02/15/17 14:51	
Lead	ug/L	ND	5.0	02/15/17 14:51	
Nickel	ug/L	ND	5.0	02/15/17 16:57	
Zinc	ug/L	ND	10.0	02/15/17 16:57	

LABORATORY CONTROL SAMPLE: 1930956

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	500	475	95	85-115	
Lead	ug/L	500	480	96	85-115	
Nickel	ug/L	500	475	95	85-115	
Zinc	ug/L	500	519	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930957 1930958

Parameter	Units	92327203001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	30.7	500	500	513	523	96	98	70-130	2	20	
Lead	ug/L	ND	500	500	480	491	96	98	70-130	2	20	
Nickel	ug/L	ND	500	500	480	487	95	97	70-130	1	20	
Zinc	ug/L	33.8	500	500	545	558	102	105	70-130	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930959 1930960

Parameter	Units	92329486001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	33.1	500	500	500	501	93	94	70-130	0	20	
Lead	ug/L	ND	500	500	454	457	90	91	70-130	1	20	
Nickel	ug/L	5.3	500	500	452	455	89	90	70-130	1	20	
Zinc	ug/L	299	500	500	804	801	101	100	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 347927 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1930295 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	1.0	02/12/17 11:38	

LABORATORY CONTROL SAMPLE: 1930296

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	250	234	94	90-110	

SAMPLE DUPLICATE: 1930297

Parameter	Units	92328754001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 1930298

Parameter	Units	92329486002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	90.0	91.2	1	5	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348316 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 92329486001, 92329486002

SAMPLE DUPLICATE: 1932395

Parameter	Units	92329486001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.4	6.3	0	9	H6

SAMPLE DUPLICATE: 1932396

Parameter	Units	92329908001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	12.7	12.6	0	9	E,H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348042 Analysis Method: EPA 350.1 1993 Rev 2.0
QC Batch Method: EPA 350.1 1993 Rev 2.0 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1931073 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	02/15/17 02:31	

LABORATORY CONTROL SAMPLE: 1931074

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931075 1931076

Parameter	Units	92329414001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	4.7	4.7	94	94	90-110	0	7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931077 1931078

Parameter	Units	92329581001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	24.8	5	5	29.3	29.6	89	96	90-110	1	7	M1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348040 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1931063 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	02/16/17 02:24	

LABORATORY CONTROL SAMPLE: 1931064

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931065 1931066

Parameter	Units	92329407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	1.2	10	10	9.7	9.9	85	87	90-110	2	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931067 1931068

Parameter	Units	92329431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	15.0	10	10	22.4	25.9	73	108	90-110	15	10	M1,R1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348342
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1932594 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	02/15/17 18:17	

LABORATORY CONTROL SAMPLE: 1932595

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1932596 1932597

Parameter	Units	92329261010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.30	2.5	2.5	2.7	2.7	96	97	75-125	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1932598 1932599

Parameter	Units	92329407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	24.8	2.5	2.5	24.6	24.8	-5	1	75-125	1	10	M1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348026 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1930997 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	02/14/17 01:05	

LABORATORY CONTROL SAMPLE: 1930998

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930999 1931000

Parameter	Units	92329407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.35	2.5	2.5	2.9	2.9	102	102	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931001 1931002

Parameter	Units	92329421001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	2.6	2.5	2.5	5.3	5.3	108	106	90-110	1	10	

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REPORT OF LABORATORY ANALYSIS

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

QC Batch: 348193 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD
Associated Lab Samples: 92329486001, 92329486002

METHOD BLANK: 1931993 Matrix: Water
Associated Lab Samples: 92329486001, 92329486002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	25.0	02/14/17 22:34	

LABORATORY CONTROL SAMPLE: 1931994

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	750	758	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931995 1931996

Parameter	Units	92329486001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	93.0	750	750	865	873	103	104	90-110	1	3	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92329486

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92329486001	**0209 DAL**	EPA 200.7	348016	EPA 200.7	348064
92329486002	**0209 MAN**	EPA 200.7	348016	EPA 200.7	348064
92329486001	**0209 DAL**	SM 2540D	347927		
92329486002	**0209 MAN**	SM 2540D	347927		
92329486001	**0209 DAL**	EPA 9040	348316		
92329486002	**0209 MAN**	EPA 9040	348316		
92329486001	**0209 DAL**	EPA 350.1 1993 Rev 2.0	348042		
92329486002	**0209 MAN**	EPA 350.1 1993 Rev 2.0	348042		
92329486001	**0209 DAL**	EPA 351.2	348040		
92329486002	**0209 MAN**	EPA 351.2	348040		
92329486001	**0209 DAL**	EPA 353.2	348342		
92329486002	**0209 MAN**	EPA 353.2	348342		
92329486001	**0209 DAL**	EPA 365.1	348026		
92329486002	**0209 MAN**	EPA 365.1	348026		
92329486001	**0209 DAL**	SM 5220D	348193		
92329486002	**0209 MAN**	SM 5220D	348193		

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Amec

Project #:

WO# : 92329486

92329486

Courier: ☐ Commercial ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: JM 2-10-17

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____

Thermometer: ☑ IR Gun ID: T1603 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 1.1 **Biological Tissue Frozen?** ☐ Yes ☑ No ☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☑ Yes	☐ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: W +				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: JH **Date:** 2/13/17

Project Manager SRF Review: JH **Date:** 2/13/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles 1157

Project # WO#: 92329486

PM: KRG Due Date: 02/16/17

CLIENT: 92-Amec VA

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1	1			1	2	1																							
2	1			1	2	1																							
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	
Company:	Amec Foster Wheeler, Va	Report To: Green, Ben	Attention:	
Address:	14424 Albemarle Point Place	Copy To:	Company Name:	Regulatory Agency
Suite 115, Chantilly, VA 20151			Address:	
Email:		Purchase Order #:	Pace Quote:	
Phone:	Fax	Project Name: PRINCE WILLIAM CO STORMWATER	Pace Project Manager: kevin.godwin@pacelabs.com,	State / Location
Requested Due Date:		Project #:	Pace Profile #: 8125-1	VA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): pH	Metals	TSS	Ammonia/Phosphorus/COD	TKN + Nitrate+Nitrite	Residual Chlorine (Y/N)	9232 94820
1	0209 DAL	SW	C	02/09	03:50	02/09	07:30		5	2	2	1							√	√	√	√	√		001
2	0209 MAN	SW	C	02/09	03:00	02/09	10/09		5	2	2	1							√	√	√	√	√		002
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Ben Green/Amec FW	02/09	17:30	PACE HVL	2-10-17	0955	1.1	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Benjamin T. Green

SIGNATURE of SAMPLER: [signature]

DATE Signed: 02/09/2017

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Wet Weather Monitoring Report

Second Quarter 2017 (April 1 – June 30, 2017)
Event Dates: May 4; June 23, 2017

Prepared for:

Prince William County Department of Public Works
5 County Complex Court, Suite 170
Prince William, Virginia 22192

Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
11424 Albemarle Point Place, Suite 115
Chantilly, VA 20151
(703) 488-3700

July 26, 2017
Project No. 151270004

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is pleased to provide this report of wet weather monitoring for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Municipal Separate Storm Sewer System (MS4) Permit (Number VA0088595), issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. This report discusses the results of the Q2 sampling event conducted on May 4 and June 23-24, 2017, as well as the findings from the water quality analysis results of those sampling events.

2.0 METHODS

Flow rate data were collected at the outfalls by an ISCO 6712 automated sampler coupled with an ISCO 730 bubbler flow module. Flow rate over the course of the sampling events were electronically calculated using ISCO Flowlink 5.1 software, which utilizes the Manning Equation to convert flow level and velocity to flow rate.

SITE #941; MANASSAS, VA

Site #941 is located near 11850 Livingston Road. The site receives a total of 52 acres of upstream drainage area from a land surface that is 34% impervious. Further evaluation of County data revealed that the pipe is 54 inches in diameter with a slope of 0.03437. There has consistently been a low level of water in the pipe, as it is at the same elevation of an adjacent stormwater pond.

SITE #4684; DALE CITY, VA

Site #4684 is located near the corner of Potomac Center Blvd. and Sheffield Way, at 2425 Brookmore Lane. It drains into a BMP for the Potomac Club residential development. Upstream drainage totaled 51 acres, 21% of which is from impervious surfaces. The pipe is 54 inches in diameter with a slope of 0.002593.

The automated samplers were deployed when a qualifying storm event (>0.3 inches precipitation) was forecast for the two monitoring sites. On May 4, Amec Foster Wheeler staff deployed the samplers at both field sites and programmed the samplers' automated, discrete sampling sequence to initiate upon flow levels exceeding seven or 0.5 inches, at Site #941 and #4684, respectively. The samplers were programmed to collect 24 discrete 1L samples to be collected every 30 minutes over a 12-hour duration. Rain gage data were compiled for monitoring stations in the Weather Underground monitoring network. The data were easily accessible online, and provided hourly precipitation totals over the monitoring period. Gages were prioritized based on the makeup of the data record (reporting interval) and proximity to monitoring locations.

This storm event produced heavier rains than previous events sampled, resulting in a large volume of stormwater flow, which dislodged the sampling equipment and resulted in an unsuccessful sampling at Site #4684. Amec Foster Wheeler was able to successfully sample a storm event on June 23-24 at Site #4684. To better accommodate the forecasted heavy storm conditions over a short period of time, the sampling presets and equipment setup were modified. Sampling was initiated upon flow levels exceeding 0.5 inches, and samples were collected every 15 minutes over the course of 8 hours. Additionally, scissor rings were deployed to prevent the sampling equipment from being dislodged during this storm event. The sampling event was

successful and consisted of two sets of individual events occurring over 24 hours, producing 15 discrete samples.

Following the storm event, staff retrieved the samples and prepared them for shipment to Pace Environmental for water quality analysis. In order to compile the complete set of discrete samples into a single flow-weighted composite, discharge was calculated within the Flowlink software using the Manning Equation:

$$Q = VA = (\frac{1.49}{n})AR^{\frac{2}{3}}\sqrt{S}\ [\ US\ ]$$

Q = Flow rate
A = Flow area
V = Avg. velocity
S = Water surface slope
R = Hydraulic Radius
n = Roughness coefficient
1.49 = English units conversion factor

Channel slopes were determined using invert elevations reported in the stormwater infrastructure geospatial data provided by Prince William County. Using flow levels reported by the ISCO samplers, the area and hydraulic radius inside the sampled outfalls could be computed for a given time interval. A Manning's *n* value of 0.013 was assumed for the concrete pipes. Discrete samples collected over the duration of the storm event were then mixed based on their representative weight within the cumulative flow curve for each storm event. This flow weighted composite sample was provided to the laboratory for analysis. The resulting analysis is considered the event mean concentration (EMC) of the individual analyte.

3.0 RESULTS

SITE #941; MANASSAS, VA

Sampling occurred from 11:14pm May 4 to 10:44am May 5, 2017. Precipitation data recorded at Dulles International Airport (KIAD) totaled 3.91 inches during this same interval. The precipitation consisted of rain with intermittent intensities. Temperatures ranged from 51.1 – 63.0 degrees F during the Dulles precipitation event. The previously recorded event at this gage occurred from 02:00am – 08:00am on May 1, which totaled greater than 0.5 inches of precipitation. Samples were retained under refrigeration until they were composited and shipped overnight to Pace Analytical on May 6, 2017.

SITE #4684; DALE CITY, VA

Sampling occurred from 05:55am June 23 2to 06:20am June 24, 2017. Precipitation data recorded at Ft. Belvoir, VA (KDAA) totaled 0.31 inches over that same 24 hour interval. The precipitation consisted primarily of light rain. Temperatures ranged from 71.6 - 86.5 degrees F over the sample collection period. The previously measured rain event at this gage occurred June 20, with less than 0.01 inches of precipitation. The storm event was bi-modal, and sampled over the course of two separate deployments within a 24-hour period. The sampler had been adjusted to collect samples every 15 minutes. While some stormwater flow was recorded between the two peaks of the hydrograph, (Figure 2) flow was low enough that a sample was not collected by the ISCO sampler. Thus, only 15 of the anticipated 24 samples were successfully collected by the ISCO sampler, covering the first 1.5 hours and final two hours of the storm event. Samples were retained under refrigeration until they were composited and shipped overnight to Pace Analytical on June 27, 2017.

3.1 FLOW DATA

SITE #941; MANASSAS, VA

Flow ranged from 9.99 – 10.52 cfs. The storm event hydrograph compared with cumulative volume can be seen in **Figure 1**. **Table 1** lists the proportion of each sample mixed with the flow-weighted composite.

Figure 1: Flow data over time for the storm event at Site #941 on May 4-5, 2017.

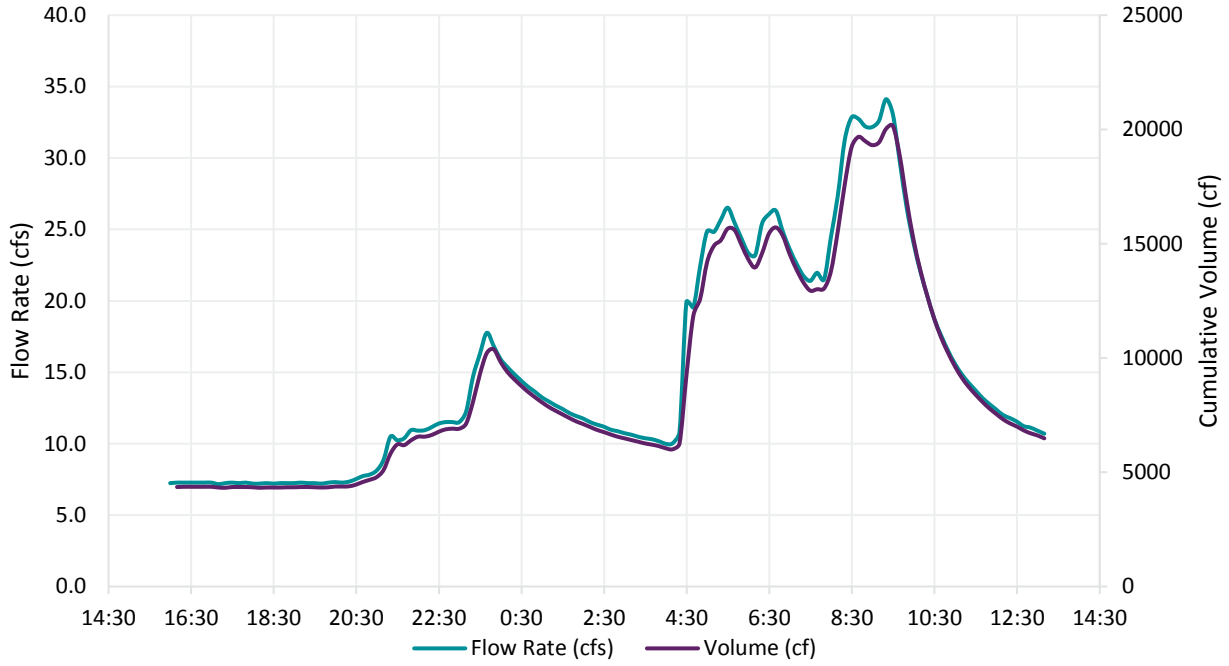


Table 1: Summary of Flow Weighted Composite – Site #941

Bottle #	Time of Sample	Volume (cf)	% of Flow	Flow Weighted Volume (L)*
1	11:14:00 PM	7130.03793	2.55	0.10
2	11:44:00 PM	10213.0112	3.65	0.15
3	12:14:00 AM	9386.64726	3.35	0.13
4	12:44:00 AM	8517.90564	3.04	0.12
5	1:14:00 AM	7861.05222	2.81	0.11
6	1:44:00 AM	7373.70936	2.63	0.11
7	2:14:00 AM	6981.71619	2.49	0.10
8	2:44:00 AM	6653.28948	2.38	0.10
9	3:14:00 AM	6409.61805	2.29	0.09
10	3:44:00 AM	6208.32426	2.22	0.09
11	4:14:00 AM	6007.03047	2.15	0.09
12	4:44:00 AM	11833.956	4.23	0.17
13	5:14:00 AM	14906.3349	5.33	0.21
14	5:44:00 AM	15594.9715	5.57	0.22
15	6:14:00 AM	13963.4324	4.99	0.20
16	6:44:00 AM	15711.51	5.61	0.22
17	7:14:00 AM	13868.0827	4.96	0.20
18	7:44:00 AM	13009.9355	4.65	0.19
19	8:14:00 AM	15552.5939	5.56	0.22
20	8:44:00 AM	19673.8194	7.03	0.28
21	9:14:00 AM	19440.7424	6.95	0.28
22	9:44:00 AM	18836.861	6.73	0.27
23	10:14:00 AM	13825.7051	4.94	0.20
24	10:44:00 AM	10901.6479	3.90	0.16

**4.0 L Sample*

SITE #4684; DALE CITY, VA

Flow ranged from 0.00 – 3.18 cfs. The storm event hydrograph compared with cumulative volume can be seen in **Figure 2**. The two peaks of the storm event hydrograph are detailed in **Figure 3**. **Table 2** lists the proportion of each sample mixed with the flow-weighted composite.

Figure 2: Flow data over time for the storm event at Site #4684 on June 23-24, 2017.

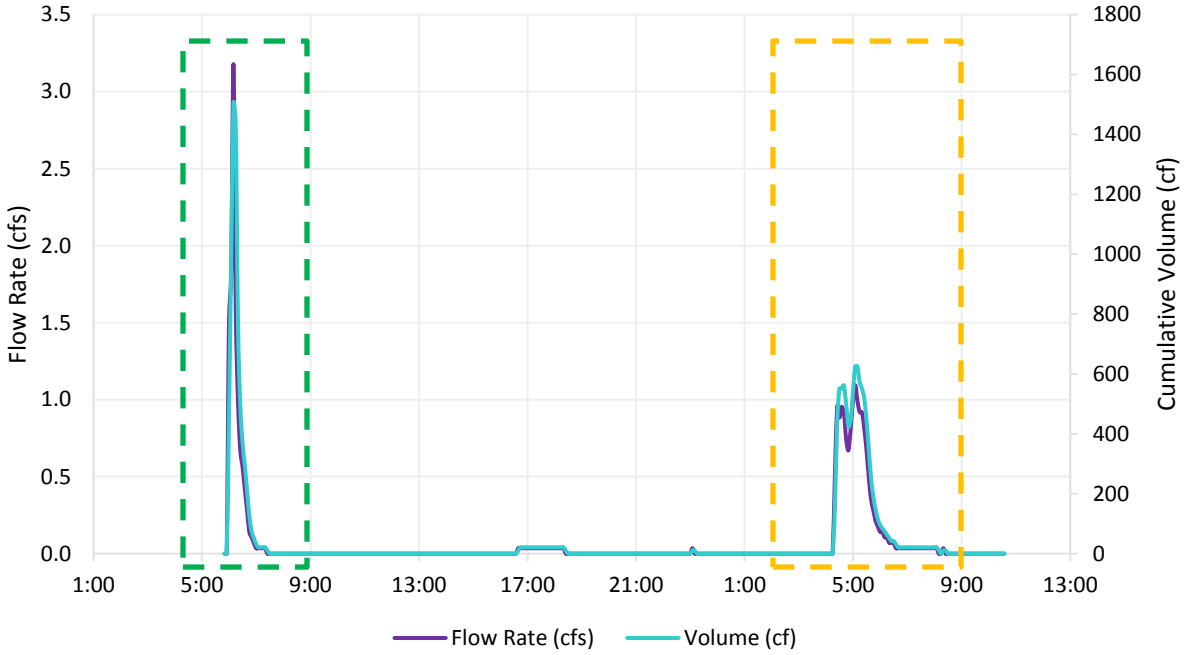
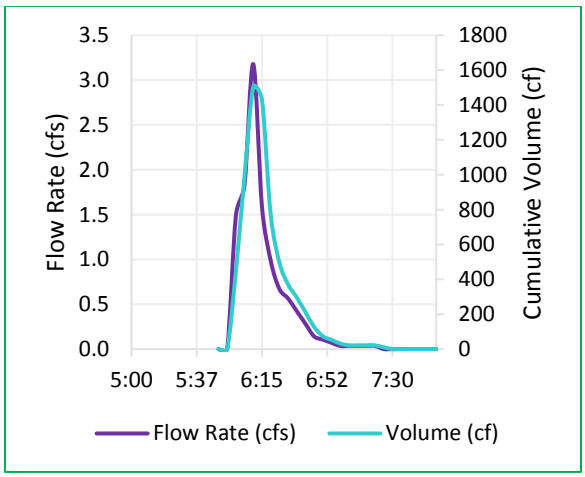


Figure 3: Modes of storm event recorded at Site #4684 June 23-24, 2017.



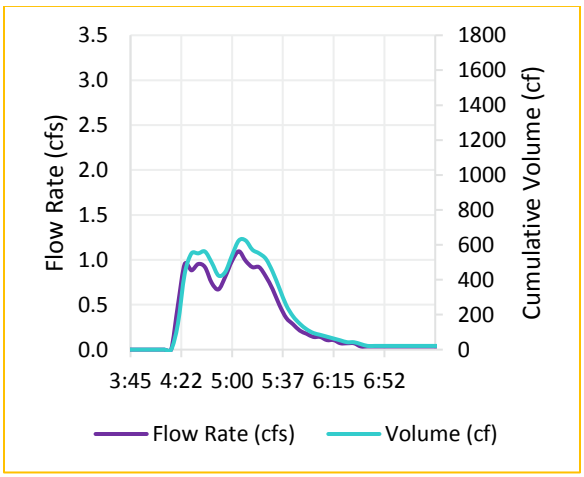


Table 2: Summary of Flow Weighted Composite – Site #4684

Bottle #	Time of Sample	Volume (cf)	% of Flow	Flow Weighted Volume (L)*
1	5:55:00 AM	444.97	8.30	0.31
2	6:10:00 AM	1430.25	26.68	1.00
3	6:25:00 AM	370.80	6.92	0.26
4	6:40:00 AM	127.13	2.37	0.09
5	6:55:00 AM	31.78	0.59	0.02
6	7:10:00 AM	21.19	0.40	0.01
7	4:20:00 AM	148.32	2.77	0.10
8	4:35:00 AM	550.91	10.28	0.39
9	4:50:00 AM	423.78	7.91	0.30
10	5:05:00 AM	625.07	11.66	0.44
11	5:20:00 AM	550.91	10.28	0.39
12	5:35:00 AM	349.62	6.52	0.24
13	5:50:00 AM	148.32	2.77	0.10
14	6:05:00 AM	84.76	1.58	0.06
15	6:20:00 AM	52.97	0.99	0.04

**3.75 L Sample*

3.2 LABORATORY ANALYTICAL RESULTS

Samples were sent to Pace Analytical Services, Inc. lab in Asheville, NC for analysis, with Analytical Parameters tested listed in **Table 3**.

Table 3: Analytical Parameters

Analyte	Analysis Method
Copper	EPA 200.7
Lead	EPA 200.7
Nickel	EPA 200.7
Zinc	EPA 200.7
Total Suspended Solids	SM 2540D
pH	EPA 9040
Ammonia	EPA 350.1 1993 Rev 2.0
Total Kjeldahl Nitrogen	EPA 351.2
Nitrate + Nitrite Nitrogen	EPA 353.2
Total Phosphorus	EPA 365.1
Chemical Oxygen Demand	SM 5220D

	Analyte	Analyte Value*	Analyte Unit	Detection Limit	Exceedance Criterion	Criterion Basis
Manassas (#941)	Copper	24.00	µg/L	5	13	a
	Lead	7.10	µg/L	5	120	a
	Nickel	6.40	µg/L	5	180	a
	Zinc	270.00	µg/L	10	120	a
	Total Suspended Solids	45.70	mg/L	10	100	b
	Nitrogen, Ammonia	0.10	mg/L	0.1		-
	Nitrogen, Kjeldahl, Total	0.73	mg/L	0.5		-
	Nitrogen, NO2 plus NO3	0.053	mg/L	0.02		-
	Total Nitrogen	0.78	mg/L	-	2.2	c
	Phosphorus, Total	0.096	mg/L	0.05	2	b
	Chemical Oxygen Demand	66.0	mg/L	25	120	b
	pH	7.4	Std. Units	0.1	6.0-9.0	d
Dale City (#4684)	Copper	25.40	µg/L	5	13	a
	Lead	ND	µg/L	5	120	a
	Nickel	ND	µg/L	5	180	a
	Zinc	98.00	µg/L	10	120	a
	Total Suspended Solids	27.00	mg/L	10	100	b
	Nitrogen, Ammonia	0.12	mg/L	0.1		-
	Nitrogen, Kjeldahl, Total	1.80	mg/L	0.5		-
	Nitrogen, NO2 plus NO3	0.32	mg/L	0.02		-
	Total Nitrogen	2.24	mg/L	-	2.2	c
	Phosphorus, Total	0.200	mg/L	0.05	2	b
	Chemical Oxygen Demand	54.0	mg/L	25	120	b
	pH	5.3	Std. Units	0.1	6.0-9.0	d

[a]State Water Quality Control Board Acute Standards for Surface Water Quality. Value is based on an assumed hardness of 100mg/L.
[b]Based on benchmark criteria for the VPDES Industrial Stormwater General Permit.
[c]The sum of Nitrogen as Ammonia, NO^2, NO^3, and Total Kjeldahl Nitrogen.
[d]Based on numeric effluent limitations noted in the VPDES Permit for Discharge of Stormwater Associated with Industrial Activity.
*Values highlighted in red were found to be in exceedance of their respective criterion.

4.0 SUMMARY

A review of the data indicates that the discharge from both sites exceeded water quality criteria for multiple analytes. As indicated in **Table 3,** noted exceedances occurred at both sites for Copper (24.0 µg/L at Site #941 and 25.4 µg/L at Site #4684), Site #941 experienced an exceedance for Zinc, while Site #4684 experienced exceedances for Total Nitrogen (2.24 mg/L) and pH (5.3). Site #941 has been in exceedance for Copper for each of the past four quarters, and Zinc for three of the past four quarters. Site #4684 has been in exceedance for Total Nitrogen for each of the past four quarters, Copper for three of the past four quarters, and pH for two of the past four quarters. Exceedance tracking for parameters of concern are illustrated in the figure below.

Figure 4: Exceedance tracking for the Wet Weather Monitoring Program.

Manassas (#941)

	2016		2017	
	Q3	Q4	Q1	Q2
Copper	x	x	x	x
Lead				
Nickel				
Zinc	x		x	x
Total Suspended Solids				
Total Nitrogen				
Phosphorus, Total				
Chemical Oxygen Demand		x		
pH				

Dale City (#4684)

	2016		2017	
	Q3	Q4	Q1	Q2
Copper	x		x	x
Lead				
Nickel				
Zinc			x	
Total Suspended Solids				
Total Nitrogen	x	x	x	x
Phosphorus, Total				
Chemical Oxygen Demand				
pH		x		x

APPENDIX A

SITE CONDITIONS

Manassas (#941)

Site #941 is located within the Bull Run watershed. It receives drainage from an industrial use area and parking lots with frequent truck traffic. The outfall exhibited signs of recent repair, but some cracks are evident. There were two inches of standing water in the pipe when the ISCO sampler was deployed, but sampling was not initiated until the water exceeded seven inches. Sediment continues to accumulate within the downstream channel, and the water level was higher than the previous quarter.

There was a slightly oily sheen apparent in the standing water within the outfall following the storm.

Dale City (#4684)

Site #4684 receives flow from Neabsco Mills Road and the Stonebridge at Potomac Town Center development. It is a 54" concrete pipe that drains to a deep scour pool before draining to a large BMP that collects drainage for the Potomac Club development. Erosion around the outfall apron is continuing, and will likely require future maintenance. Following the initial failed sampling event, Amec Foster Wheeler successfully implemented the scissor ring installation for the contingency sample. There continues to be a noticeable amount of iron oxidizing bacteria resulting from nondetectable groundwater baseflow.

There was an oily sheen present in the scour pool following the storm. Each storm event produces a small amount of trash within the scour pool and downstream riprap.

APPENDIX B

WATER QUALITY LABORATORY RESULTS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

May 16, 2017

Jen Furey
Amec Foster Wheeler
14424 Albemarle Point Place
Suite 115
Chantilly, VA 20151

RE: Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

Dear Jen Furey:
Enclosed are the analytical results for sample(s) received by the laboratory on May 06, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

cc: Benjamin Green, Amec Foster Wheeler

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92339648001	**MAN05052017**	Water	05/05/17 10:30	05/06/17 10:20

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92339648001	**MAN05052017**	EPA 200.7	SH1	4	PASI-A
		SM 2540D	MDW	1	PASI-A
		EPA 9040	ALC	1	PASI-A
		EPA 350.1 1993 Rev 2.0	AES2	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	BRJ	1	PASI-A
		SM 5220D	CJH1	1	PASI-A

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

Sample: MAN05052017 **Lab ID: 92339648001** Collected: 05/05/17 10:30 Received: 05/06/17 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper	**24.0**	ug/L	5.0	1	05/09/17 12:25	05/13/17 16:39	7440-50-8	
Lead	**7.1**	ug/L	5.0	1	05/09/17 12:25	05/13/17 16:39	7439-92-1	
Nickel	**6.4**	ug/L	5.0	1	05/09/17 12:25	05/16/17 14:17	7440-02-0	
Zinc	**270**	ug/L	10.0	1	05/09/17 12:25	05/13/17 16:39	7440-66-6	
2540D TSS, Low-Level	Analytical Method: SM 2540D							
Total Suspended Solids	**45.7**	mg/L	3.3	1		05/09/17 22:13		
9040 pH	Analytical Method: EPA 9040							
pH	**7.4**	Std. Units	0.10	1		05/08/17 14:18		H6
350.1 Ammonia	Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	**0.10**	mg/L	0.10	1		05/11/17 11:06	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.73**	mg/L	0.50	1		05/11/17 02:16	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.053**	mg/L	0.020	1		05/10/17 09:51		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.096**	mg/L	0.050	1		05/11/17 07:04	7723-14-0	
5220D COD	Analytical Method: SM 5220D							
Chemical Oxygen Demand	**66.0**	mg/L	25.0	1		05/10/17 05:00		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359677
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 MET
Associated Lab Samples: 92339648001

METHOD BLANK: 1994625 Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	5.0	05/13/17 16:08	
Lead	ug/L	ND	5.0	05/13/17 16:08	
Nickel	ug/L	ND	5.0	05/16/17 14:02	
Zinc	ug/L	ND	10.0	05/13/17 16:08	

LABORATORY CONTROL SAMPLE: 1994626

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	500	514	103	85-115	
Lead	ug/L	500	487	97	85-115	
Nickel	ug/L	500	476	95	85-115	
Zinc	ug/L	500	496	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994627 1994628

Parameter	Units	92339522001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	8.8	500	500	520	527	102	104	70-130	1	20	
Lead	ug/L	ND	500	500	465	470	93	94	70-130	1	20	
Nickel	ug/L	ND	500	500	462	468	92	93	70-130	1	20	
Zinc	ug/L	23.7	500	500	512	520	98	99	70-130	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994629 1994630

Parameter	Units	92339432001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	ND	500	500	510	487	102	97	70-130	5	20	
Lead	ug/L	ND	500	500	474	455	95	91	70-130	4	20	
Nickel	ug/L	ND	500	500	474	454	94	90	70-130	4	20	
Zinc	ug/L	0.010 mg/L	500	500	505	478	99	94	70-130	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359809
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 92339648001

METHOD BLANK: 1995442
Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	1.0	05/09/17 22:09	

LABORATORY CONTROL SAMPLE: 1995443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	250	244	98	90-110	

SAMPLE DUPLICATE: 1995444

Parameter	Units	92339647001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	5.2	10.4	66	5	D6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359568 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 92339648001

SAMPLE DUPLICATE: 1994221

Parameter	Units	92339573001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.2	6.3	2	9	H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359828 Analysis Method: EPA 350.1 1993 Rev 2.0
QC Batch Method: EPA 350.1 1993 Rev 2.0 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 92339648001

METHOD BLANK: 1995501 Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	05/11/17 10:36	

LABORATORY CONTROL SAMPLE: 1995502

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1995503 1995504

Parameter	Units	92339049003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.32	5	5	5.3	5.2	99	98	90-110	0	7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1995505 1995506

Parameter	Units	92339108007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	4.9	4.9	98	98	90-110	0	7	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359638 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92339648001

METHOD BLANK: 1994501 Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	05/11/17 01:59	

LABORATORY CONTROL SAMPLE: 1994502

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994503 1994504

Parameter	Units	92339406003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	4.3	10	10	13.9	13.9	97	96	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994505 1994506

Parameter	Units	92339559001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	451	10	10	12.2	12.5	-4380	-4380	90-110	2	10	M1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359640
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92339648001

METHOD BLANK: 1994511 Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	05/10/17 09:36	

LABORATORY CONTROL SAMPLE: 1994512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994513 1994514

Parameter	Units	92339285001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	2.2	2.5	2.5	4.6	4.6	95	94	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994515 1994516

Parameter	Units	92338909001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.14	2.5	2.5	1.3	1.3	48	48	75-125	0	10	M1

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359833
QC Batch Method: EPA 365.1
Analysis Method: EPA 365.1
Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92339648001

METHOD BLANK: 1995531 Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	05/11/17 07:00	

LABORATORY CONTROL SAMPLE: 1995532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.4	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1995533 1995534

Parameter	Units	92337541001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	2.4	2.5	2.5	4.9	4.7	100	91	90-110	5	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1995535 1995536

Parameter	Units	92339881002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	2.5	2.5	2.5	2.5	98	100	90-110	1	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

QC Batch: 359773 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD
Associated Lab Samples: 92339648001

METHOD BLANK: 1995317 Matrix: Water
Associated Lab Samples: 92339648001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	25.0	05/10/17 05:00	

LABORATORY CONTROL SAMPLE: 1995318

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	750	737	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1995319 1995320

Parameter	Units	92339099008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	1940	750	750	2390	2350	60	54	90-110	2	3	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1995321 1995322

Parameter	Units	92338940002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	172	750	750	780	782	81	81	90-110	0	3	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRINCE WILLIAM CO STORMWATER
Pace Project No.: 92339648

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92339648001	**MAN05052017**	EPA 200.7	359677	EPA 200.7	359780
92339648001	**MAN05052017**	SM 2540D	359809		
92339648001	**MAN05052017**	EPA 9040	359568		
92339648001	**MAN05052017**	EPA 350.1 1993 Rev 2.0	359828		
92339648001	**MAN05052017**	EPA 351.2	359638		
92339648001	**MAN05052017**	EPA 353.2	359640		
92339648001	**MAN05052017**	EPA 365.1	359833		
92339648001	**MAN05052017**	SM 5220D	359773		

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples: Asheville [X] Eden [ ] Greenwood [ ] Huntersville [ ] Raleigh [ ] Mechanicsville [ ]

WO# : 92339648

92339648

Sample Condition Upon Receipt

Client Name: AMEC

Project #

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other:

Custody Seal Present? [ ] Yes [X] No **Seals Intact?** [ ] Yes [X] No

Date/Initials Person Examining Contents: JM 5-6-17

Packing Material: [ ] Bubble Wrap [ ] Bubble Bags [X] None [ ] Other:

Thermometer: [ ] IR Gun ID: #5 **Type of Ice:** [X] Wet [ ] Blue [ ] None [X] Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 1.3 **Biological Tissue Frozen?** [ ] Yes [ ] No [X] N/A

Temp should be above freezing to 6°C

USDA Regulated Soil ([X] N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? [ ] Yes [X] No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? [ ] Yes [ ] No

				Comments/Discrepancy:
Chain of Custody Present?	[X] Yes	[ ] No	[ ] N/A	1.
Samples Arrived within Hold Time?	[X] Yes	[ ] No	[ ] N/A	2.
Short Hold Time Analysis (<72 hr.)?	[ ] Yes	[X] No	[ ] N/A	3.
Rush Turn Around Time Requested?	[ ] Yes	[X] No	[ ] N/A	4.
Sufficient Volume?	[X] Yes	[ ] No	[ ] N/A	5.
Correct Containers Used?	[X] Yes	[ ] No	[ ] N/A	6.
-Pace Containers Used?	[X] Yes	[ ] No	[ ] N/A	
Containers Intact?	[X] Yes	[ ] No	[ ] N/A	7.
Samples Field Filtered?	[ ] Yes	[ ] No	[X] N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	[X] Yes	[ ] No	[ ] N/A	9.
-Includes Date/Time/ID/Analysis Matrix:				
Headspace in VOA Vials (>5-6mm)?	[ ] Yes	[ ] No	[X] N/A	10.
Trip Blank Present?	[ ] Yes	[ ] No	[X] N/A	11.
Trip Blank Custody Seals Present?	[ ] Yes	[ ] No	[X] N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** [ ] Yes [ ] No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: JG **Date:** 5/9/17

Project Manager SRF Review: JG **Date:** 5/9/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project # WO#: 92339648

PM: KRG Due Date: 05/15/17

CLIENT: 92-Amec VA

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN	
1	1	1	1	1	1	1		1																					
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A – Required Client Information:	Section B – Required Project Information:	Section C – Invoice Information:
Company: Amec Foster Wheeler, Va	Report To: Green, Ben	Attention:
Address: 14424 Albemarle Point Place	Copy To:	Company Name:
Suite 115, Chantilly, VA 20151		Address:
Email:	Purchase Order #:	Pace Quote:
Phone: 703-488-3700 Fax	Project Name: PRINCE WILLIAM CO STORMWATER	Pace Project Manager: kevin.godwin@pacelabs.com
Requested Due Date:	Project #:	Pace Profile #: 8125-1

Regulatory Agency:

State / Location: VA

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	pH	Metals	TSS	Ammonia/Phosphorus/COD	TKN + Nitrate+Nitrite	Residual Chlorine (Y/N)	92339646
1	MANOSOS2017	WT	G	05/04	1302	05/05	10:30		5	2	2	1							✓	✓	✓	✓	✓	✓		OCL
2		WT	G						5	2	2	1							✓	✓	✓	✓	✓	✓		
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
				[signature]	5-6-17	1020	1.3 / Y / N / Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Benjamin Green

SIGNATURE of SAMPLER: [signature] DATE Signed: 05/05/2017

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.3	Y	N	Y

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

July 07, 2017

Jen Furey
Amec Foster Wheeler
14424 Albemarle Point Place
Suite 115
Chantilly, VA 20151

RE: Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

Dear Jen Furey:
Enclosed are the analytical results for sample(s) received by the laboratory on June 28, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

cc: Benjamin Green, Amec Foster Wheeler

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92345879001	**DAL 062417**	Water	06/24/17 06:20	06/28/17 10:25

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92345879001	**DAL 062417**	EPA 200.7	SH1	4	PASI-A
		SM 2540D	SLB	1	PASI-A
		EPA 9040	ECH	1	PASI-A
		EPA 350.1 1993 Rev 2.0	BRJ	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	BRJ	1	PASI-A
		SM 5220D	NAL	1	PASI-A

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

Sample: DAL 062417 **Lab ID: 92345879001** Collected: 06/24/17 06:20 Received: 06/28/17 10:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Copper	**25.4**	ug/L	5.0	1	06/29/17 16:15	06/30/17 21:29	7440-50-8	
Lead	ND	ug/L	5.0	1	06/29/17 16:15	06/30/17 21:29	7439-92-1	
Nickel	ND	ug/L	5.0	1	06/29/17 16:15	06/30/17 21:29	7440-02-0	
Zinc	**98.0**	ug/L	10.0	1	06/29/17 16:15	06/30/17 21:29	7440-66-6	
2540D TSS, Low-Level	Analytical Method: SM 2540D							
Total Suspended Solids	**27.0**	mg/L	4.3	1		06/28/17 15:55		
9040 pH	Analytical Method: EPA 9040							
pH	**5.3**	Std. Units	0.10	1		07/03/17 10:40		H6
350.1 Ammonia	Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	**0.12**	mg/L	0.10	1		06/29/17 19:34	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**1.8**	mg/L	0.50	1		07/06/17 22:11	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.32**	mg/L	0.020	1		07/05/17 14:46		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.20**	mg/L	0.050	1		06/30/17 14:04	7723-14-0	
5220D COD	Analytical Method: SM 5220D							
Chemical Oxygen Demand	**54.0**	mg/L	25.0	1		06/29/17 21:25		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 366977 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 92345879001

METHOD BLANK: 2034156 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	ND	5.0	06/30/17 20:27	
Lead	ug/L	ND	5.0	06/30/17 20:27	
Nickel	ug/L	ND	5.0	06/30/17 20:27	
Zinc	ug/L	ND	10.0	06/30/17 20:27	

LABORATORY CONTROL SAMPLE: 2034157

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	500	535	107	85-115	
Lead	ug/L	500	512	102	85-115	
Nickel	ug/L	500	504	101	85-115	
Zinc	ug/L	500	527	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034158 2034159

Parameter	Units	92345475001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	18.6	500	500	570	560	110	108	70-130	2	20	
Lead	ug/L	ND	500	500	19.4	ND	4	0	70-130		20	M1
Nickel	ug/L	ND	500	500	286	264	56	52	70-130	8	20	M1
Zinc	ug/L	29.2	500	500	381	363	70	67	70-130	5	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034160 2034161

Parameter	Units	92345805004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Copper	ug/L	16.6	500	500	520	522	101	101	70-130	0	20	
Lead	ug/L	ND	500	500	467	466	93	93	70-130	0	20	
Nickel	ug/L	ND	500	500	464	462	93	92	70-130	0	20	
Zinc	ug/L	40.7	500	500	535	526	99	97	70-130	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 366910 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 92345879001

METHOD BLANK: 2033785 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	1.0	06/28/17 15:52	

LABORATORY CONTROL SAMPLE: 2033786

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	250	240	96	90-110	

SAMPLE DUPLICATE: 2033787

Parameter	Units	92345526002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	7.6	9.6	23	5	D6

SAMPLE DUPLICATE: 2033788

Parameter	Units	92345701001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

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REPORT OF LABORATORY ANALYSIS

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9800 Kincey Ave. Suite 100
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(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 367504 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 92345879001

SAMPLE DUPLICATE: 2037138

Parameter	Units	92345369001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.9	6.9	1	9	H6

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REPORT OF LABORATORY ANALYSIS

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 367033 Analysis Method: EPA 350.1 1993 Rev 2.0
QC Batch Method: EPA 350.1 1993 Rev 2.0 Analysis Description: 350.1 Ammonia
Associated Lab Samples: 92345879001

METHOD BLANK: 2034488 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	06/29/17 19:19	

LABORATORY CONTROL SAMPLE: 2034489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034490 2034491

Parameter	Units	92345227014 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.45	5	5	5.4	5.4	99	98	90-110	1	7	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034492 2034493

Parameter	Units	92345985001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	5.1	5.1	100	100	90-110	0	7	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 367027 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92345879001

METHOD BLANK: 2034460 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	07/07/17 00:16	

LABORATORY CONTROL SAMPLE: 2034461

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.7	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034462 2034463

Parameter	Units	92345597001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.69	10	10	10.6	10.7	99	100	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034464 2034465

Parameter	Units	92345446003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	2.7	10	10	12.6	12.5	99	99	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 367747
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92345879001

METHOD BLANK: 2038121 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	07/05/17 14:12	

LABORATORY CONTROL SAMPLE: 2038122

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2038123 2038124

Parameter	Units	92345087001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.37	2.5	2.5	2.8	2.8	97	95	75-125	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2038125 2038126

Parameter	Units	92345087002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	4.7	2.5	2.5	7.3	7.3	105	103	75-125	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 367231
QC Batch Method: EPA 365.1
Analysis Method: EPA 365.1
Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92345879001

METHOD BLANK: 2035680 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	06/30/17 13:58	

LABORATORY CONTROL SAMPLE: 2035681

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2035682 2035683

Parameter	Units	92345894001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.10	2.5	2.5	2.6	2.6	98	98	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2035684 2035685

Parameter	Units	92345471003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.13	2.5	2.5	2.6	2.6	100	99	90-110	1	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

QC Batch: 367173 Analysis Method: SM 5220D
QC Batch Method: SM 5220D Analysis Description: 5220D COD
Associated Lab Samples: 92345879001

METHOD BLANK: 2035469 Matrix: Water
Associated Lab Samples: 92345879001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	25.0	06/29/17 21:25	

LABORATORY CONTROL SAMPLE: 2035470

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	750	762	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2035471 2035472

Parameter	Units	92345629001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	5380	750	750	5930	5890	74	67	90-110	1	3	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2035473 2035474

Parameter	Units	92345697004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	102	750	750	849	764	100	88	90-110	11	3	M1,R1

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REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALIFIERS

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRINCE WILLIAM CO SW 151270004
Pace Project No.: 92345879

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92345879001	**DAL 062417**	EPA 200.7	366977	EPA 200.7	367350
92345879001	**DAL 062417**	SM 2540D	366910		
92345879001	**DAL 062417**	EPA 9040	367504		
92345879001	**DAL 062417**	EPA 350.1 1993 Rev 2.0	367033		
92345879001	**DAL 062417**	EPA 351.2	367027		
92345879001	**DAL 062417**	EPA 353.2	367747		
92345879001	**DAL 062417**	EPA 365.1	367231		
92345879001	**DAL 062417**	SM 5220D	367173		

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples: Asheville ☒ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Angel Foster Proj

WO# : 92345879

Courier: ☐ Commercial ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ Other:

Custody Seal Present? ☐ Yes ☒ No Seals Intact? ☐ Yes ☐ No Date/Initials Person Examining Contents:

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other:

Thermometer: 5 ☐ IR Gun ID: Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: Cooler Temp Corrected (°C): 4.2 Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☒ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (Internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

		Comments/Discrepancy:
Chain of Custody Present?	☒ Yes ☐ No ☐ N/A	1.
Samples Arrived within Hold Time?	☒ Yes ☐ No ☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☒ Yes ☐ No ☐ N/A	3. Nitrate / Nitrite
Rush Turn Around Time Requested?	☐ Yes ☒ No ☐ N/A	4.
Sufficient Volume?	☒ Yes ☐ No ☐ N/A	5.
Correct Containers Used?	☒ Yes ☐ No ☐ N/A	6.
-Pace Containers Used?	☒ Yes ☐ No ☐ N/A	
Containers Intact?	☒ Yes ☐ No ☐ N/A	7.
Samples Field Filtered?	☒ Yes ☐ No ☐ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☒ Yes ☐ No ☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT		
Headspace in VOA Vials (>5-6mm)?	☐ Yes ☐ No ☒ N/A	10.
Trip Blank Present?	☐ Yes ☐ No ☒ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes ☐ No ☒ N/A	

Field Data Required? ☐ Yes ☐ No

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: Date/Time:

Comments/Sample Discrepancy:

Project Manager SCURF Review: JY Date: 6/28/17

Project Manager SRF Review: JY Date: 6/28/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project #

WO#: 92345879

PM: KRG Due Date: 07/06/17

CLIENT: 92-Amec VA

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN	
1																													
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

PaceAnalytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Amec Foster Wheeler, Va	Report To: Green, Ben	Attention:
Address: 14424 Albemarle Point Place	Copy To:	Company Name:
Suite 115, Chantilly, VA 20151		Address:
Email:	Purchase Order #:	Pace Quote:
Phone: 703-488-3709 Fax:	Project Name: PRINCE WILLIAM CO STORMWATER	Pace Project Manager: kevin.godwin@pacelabs.com
Requested Due Date:	Project #: 1512700004.0002	Pace Profile #: 8125-1

Regulatory Agency: [illegible]

State / Location: VA

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test: pH	Metals	TSS	Ammonia/Phosphorus/COD	TKN + Nitrate+Nitrite	Residual Chlorine (Y/N)	92345879
1	DAL062417	WT	C	06/23	06:55	06/24	06:20		5	2	2	1						✓	✓	✓	✓	✓		21
2		WT	C						5	2	2	1						✓	✓	✓	✓	✓		
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

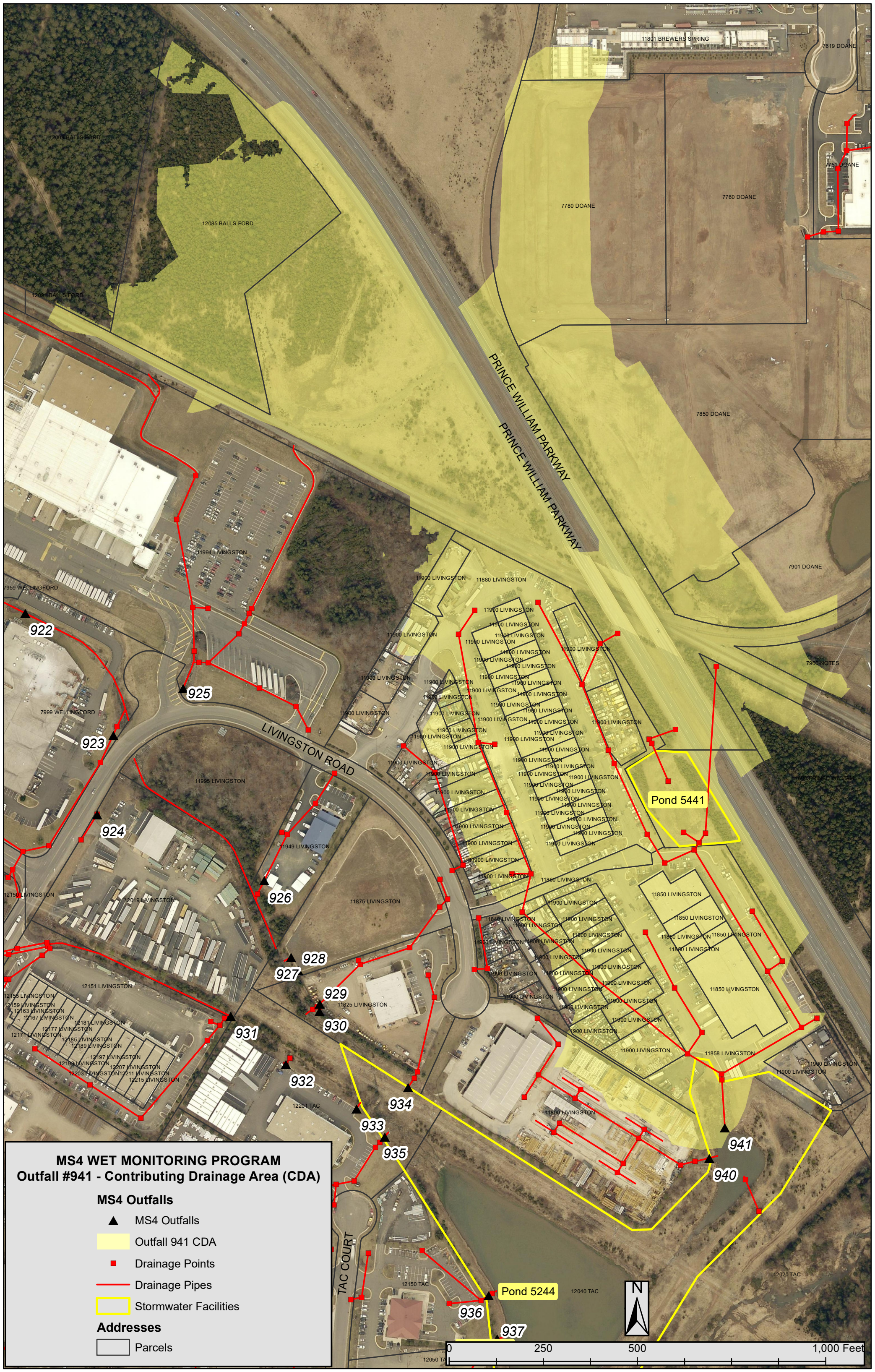
ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	B. Green / Amec	06/27	01:15	A. Wilson / Pace	6/28/17	10:25	4.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed:

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
4.2	Y	N	Y


11801 BREWERS SPRING
7619 DOANE
12003 BALLS FORD
12085 BALLS FORD
12091 BALLS FORD
7780 DOANE
7760 DOANE
7751 DOANE
PRINCE WILLIAM PARKWAY
7850 DOANE
7901 DOANE
7960 NOTES
11994 LIVINGSTON
7959 WELLINGFORD
11900 LIVINGSTON
11880 LIVINGSTON
922
925
7999 WELLINGFORD
923
LIVINGSTON ROAD
11995 LIVINGSTON
924
11949 LIVINGSTON
926
11875 LIVINGSTON
928
927
929
930
931
932
934
933
935
941
940
Pond 5441
936
937
Pond 5244
12040 TAC
12020 TAC
12150 LIVINGSTON
12019 LIVINGSTON
12151 LIVINGSTON
11825 LIVINGSTON
11860 LIVINGSTON
11850 LIVINGSTON
11840 LIVINGSTON
11858 LIVINGSTON
11800 LIVINGSTON
12201 TAC
TAC COURT
12150 TAC
12050 TAC
11600 PRINCE WILLIAM
0
250
500
1,000 Feet
N
MS4 WET MONITORING PROGRAM
Outfall #941 - Contributing Drainage Area (CDA)
MS4 Outfalls
MS4 Outfalls
Outfall 941 CDA
Drainage Points
Drainage Pipes
Stormwater Facilities
Addresses
Parcels

MS4 WET MONITORING PROGRAM
OUTFALL 4181 - Contributing Drainage Area (CDA)

MS4 Outfalls

- MS4 Outfalls
- Drainage Points
- Drainage Pipes
- Stormwater Facilities

Addresses

- Parcels

Pond 5954
Pond 5952
Pond 5953
Pond 5951
Pond 5950
Pond 810

4710
4182
4181
4180
4179
4178
4177
4174

2401 OPITZ BLVD
2401 OPITZ BLVD

I95 S EX156 OFF RAMP
I95 S HIGHWAY
I95 HOV HIGHWAY
I95 HOV HIGHWAY
I95 N HIGHWAY
I95 N EX156 ON RAMP
I95 N EX156 ON RAMP
OFF RAMP

DINING WAY
NEIGHBORHOOD WAY
BRIDGE VIEW DRIVE
GARDEN HILL TERRACE
ROCK BRIDGE COURT
RIVER ROCK WAY
POTOMAC TOWN PLACE
RIVER WALK WAY
POTOMAC CENTER BOULEVARD
POTOMAC CENTER BOULEVARD
INTERSECTION
DALE BOULEVARD
DALE BOULEVARD
SMOKE COURT

CARTHAGE DRIVE
BROOKMOOR LANE
ROBIN GLEN WAY
OBERLIN DRIVE
EASTBOURNE DRIVE
SHEFFIELD HILL WAY
LANCASHIRE DRIVE
MARGRAVE CIRCLE
LEICESTERSHIRE STREET
MERSEYSIDE DRIVE
KENTSHIRE DRIVE

N

0 250 500 1,000 Feet

Appendix M – Infrastructure Coordination

VDOT & PWC INTERAGENCY INFRASTRUCTURE COORDINATION MEETING

July 13, 2017

NAME	AGENCY	Phone / Email
MADAN MOHAN	PWC	MMOHAN@PWCGOV.ORG
Marc Aveni	PWC	maveni@pwcgov.org
David Ungar	PWC	dungar@pwcgov.org
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Tracy Herman	VDOT	tracy.herman@vdot.virginia.gov
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Chris Swanson	VDOT	chris.swanson@VDOT.Virginia.gov
Benjamin Eib	PWC	beib@pwcgov.org
Lynne Mowery	Amec Foster Wheeler	lynne.mowery@amecfw.com
Clay Morris	PWC	cmorris@pwcgov.org
Marian Carroll	VDOT	marian.carroll@vdot.virginia.gov
May Sligh	VDOT - Central	may.sligh@vdot.virginia.gov
Nasir Ahmad	PWC	nahmad@pwcgov.org

VDOT & PWC Infrastructure - Annual Coordination Meeting
July 13, 2017 - From 10 AM-Noon
Room 107 A & B –Development Services Bldg-5 County Complex Court

Meeting Notes

1. Discussion on MS-4 Service Area Mapping, with emphasis on interconnected areas with VDOT ROW. Discussion on areas of uncertainty.

    - VDOT will have new MS4 urban area layer by June 2018
    - Since VDOT's MS-4 mapping is based on year 2000 urban census, the majority of uncertain (unaccounted) areas identified in Prince William County's MS-4 service area are because of existing VDOT's right of way areas,that were not included in VDOT's mapping.

2. IDDE Programs in Interconnected Areas; Protocol for Coordination and Communication.

    - HAZMAT notifies VDOT when a response occurs on VDOT property
    - PWC will coordinate with VDOT when illicit discharges are found in interconnected areas

3. Chesapeake Bay TMDL Action Plan: Information on County's TMDL Action Plan and how it relates to VDOT's MS-4 Areas.

    - PWC and VDOT to share links/access to current TMDL Action Plans

4. County's Local TMDL Action Plan

    - PWC and VDOT to share links/access to current TMDL Action Plans
    - PWC will focus on stream restoration and outfall stabilization
    - VDOT will focus on street sweeping
    - Potential coordination for VDOT MS4 outfall stabilization should it be found their efforts will help accomplish the goal
    - County will coordinate with VDOT, if outreach signs are needed to be posted in VDOT ROW for proper handling of pet waste

5. Maps and Discussion on "**unaccounted**" areas.

6. Discuss mutual roles and responsibilities for "unaccounted" areas for IDDE, accounting for TMDL Action Plan, etc.

   - PWC will coordinate with VDOT if it is determined that joint cooperation is needed

7. VDOT's TMDL Action Plan

8. Water Quality Monitoring: Information Exchange.

   - PWC will coordinate with VDOT if determined that joint cooperation is needed

9. MS-4 Annual Reports.

   - VDOT MS4 Website (Annual report not located here, but was provided) - www.virginiadot.org/stormwater
   - PWC MS4 Website - http://www.pwcgov.org/government/dept/publicworks/environment/pages/ms-4-permit.aspx

10. Coordination with VDOT on High Risk Industrial Facilities, Illicit Discharge and Spills identified at VDOT's MS-4.

    - PWC and VDOT to share lists of high risk industrial facilities

11. Staff Contact for both agencies with their defined roles.

    A. PWC Staff
        a. David Ungar (MS4 Coordinator)
            i. Email: dungar@pwcgov.org
            ii. Phone: 703-792-7104
        b. Prem Poudel (IDDE Inspector)
            i. Email: ppoudel@pwcgov.org
            ii. Phone: 703-792-8155
        c. Clay Morris (Natural Resources Section Chief)
            i. Email: cmorris@pwcgov.org
            ii. Phone: 703-792-4615
        d. Ben Eib (Assistant Chief, Watershed Management Branch)
            i. Email: beib@pwcgov.org
            ii. Phone: 703-792-6689
        e. Madan Mohan (Chief, Watershed Management Branch)
            i. Email: mmohan@pwcgov.org
            ii. Phone: 703-792-6851
        f. Marc Aveni (Chief, Environmental Services)
            i. Email: maveni@pwcgov.org
            ii. Phone: 703-792-4064

B. VDOT Staff
    a. Marian Carroll (Northern Virginia District MS4 Coordinator)
        i. Email: marian.carroll@VDOT.Virginia.gov
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    b. Pawan Sarang (Northern Virginia District Hydraulic Engineer)
        i. Email: pawan.sarang@VDOT.Virginia.gov
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    c. Patrick Stark (Northern Virginia Asset Data Collection Manager)
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    d. Chris Swanson (MS4 Program Manager)
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    e. Chris Cowan (IDDE Manager)
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        ii. Phone: (804) 786-2480
    f. Tracey Harmon (TMDL Planner)
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        ii. Phone: (804) 371-6834
    g. May Louise Sligh (TMDL Implementation)
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        ii. Phone: (804) 225-2249
    h. Michelle Fults (MS4 Data Manager)
        i. Email: michelle.fults@VDOT.Virginia.gov
        ii. Phone: (804) 786-1294
    i. Scott Crafton (Maintenance MS4 Program Manager)
        i. Email: scott.crafton@VDOT.Virginia.gov
        ii. Phone: (804) 786-0735

Ungar, David

From: Ungar, David
Sent: Friday, August 04, 2017 2:36 PM
To: Ungar, David
Subject: RE: IDDE Contact - Prince William County

iddereports@virginia.vdot.org

From: Carroll, Marian (VDOT) [mailto:Marian.Carroll@vdot.virginia.gov]
Sent: Friday, July 14, 2017 9:07 AM
To: Cowan, Chris (VDOT) <Chris.Cowan@VDOT.Virginia.gov>
Cc: Ungar, David <DUngar@pwcgov.org>
Subject: IDDE Contact - Prince William County

Chris,

Yesterday I went to the MS4 Coordination Meeting with Prince William County and met Mr. David Ungar, the Prince William County MS4 Coordinator. Dave was asking about VDOT's IDDE program and what kind of coordination and information exchange we (VDOT) would like to have with Prince William County.

I got Dave's contact information and cc'd him to this e-mail (so now you have his e-mail address). Dave's phone number is 703-792-7104 (office) and 703-906-0230 (cell).

Dave – It was nice meeting you yesterday. Chris Cowan is in charge of VDOT's IDDE program. His e-mail address is chris.cowan@vdot.virginia.gov and his phone number is 804-786-2480.

Please feel free to contact each other when you have questions or just to make contact.

Marian

Marian Carroll | District MS4 Coordinator | VDOT | NoVA District Office | Location & Design | 4975 Alliance Drive, Fairfax, VA 22030 | 703.259.1739 (o) | 571.474.4748 (m) | marian.carroll@vdot.virginia.gov

Appendix 1 – Biological Stream Monitoring

Benthic Macroinvertebrate Population and Water Quality Monitoring Report

Fall 2016 and Spring 2017

Prepared for:

Prince William County Department of Public Works
Virginia

Prepared by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
1075 Big Shanty Road NW, Suite 100
Kennesaw, Georgia 30144
(770) 421-3400

August 2, 2017

Project No. 151270003

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TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS

Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
BI	Biotic Index
°C	Degrees Celsius
CWA	Clean Water Act
DO	Dissolved Oxygen
E. coli	*Escherichia coli*
EPT	Ephemeroptera/Plecoptera/Tricoptera
m	Meter
mg/L	Milligrams per Liter
µS/cm	Microsiemens per Centimeter
MPN/100mL	Most Probable Number of Coliform per 100 Milliliters
m/s	Meters per Second
MS4	Municipal Separate Storm Sewer System
NTU	Nephelometric Turbidity Units
PMA	Percent Model Affinity
RBP	USEPA Rapid Bioassessment Protocol
Sampling Plan	Draft Sampling Plan for Benthic Macroinvertebrate Population and Water Quality Monitoring
SU	Standard Units
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VSCI	Virginia Stream Condition Index
VSMP	Virginia Stormwater Management Program

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) has prepared this report for ongoing benthic macroinvertebrate sampling for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Permit, Municipal Separate Storm Sewer System (MS4) Permit Number VA0088595, issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. This report presents the results of the 2016 fall and 2017 spring sampling events, which were conducted in accordance with the *Sampling Plan for Benthic Macroinvertebrate Population and Water Quality Monitoring* (Sampling Plan) (Amec Foster Wheeler 2015). This report provides detailed descriptions of the sampling and analysis activities conducted, as well as the water quality analytical results and benthic macroinvertebrate results. In addition, this report provides a comparison summary with the baseline results from the 2016 spring sampling event (spring baseline).

1.1 BACKGROUND

The U.S. Environmental Protection Agency (USEPA) delegated the authority to implement Section 402 of the Clean Water Act (CWA) to the Commonwealth of Virginia on March 31, 1975. Subsequently, Section 62.1-44.15:25 of the Virginia Stormwater Management Act authorizes VDEQ to issue, deny, amend, revoke, terminate, and enforce permits for the control of stormwater discharges from MS4s. The VSMP Permit Number VA0088595 authorizes point source discharges of stormwater runoff and certain non-stormwater discharges from the MS4 operated or owned by Prince William County. Part I.C of the VSMP permit outlines the monitoring requirements guided by Section 9VAC25-870-380 C.2.c.(4) of the VSMP regulations. As stipulated in the permit, benthic macroinvertebrate and surface water monitoring is conducted at five locations in Prince William County: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch (Figures 1 through 5).

1.2 PURPOSE

The purpose of this sampling report is to provide baseline data that will be used to comply with the biological stream (Part I.C.1) and in-stream monitoring (Part I.C.2) requirements outlined in Prince William County's permit. The specific objectives are to gather sufficient data to evaluate, and subsequently demonstrate, the effectiveness of upstream best management practices. Going forward, the fall 2016 (fall baseline) sampling will represent the baseline for future fall sampling events.

2.0 METHODS

Sample collection occurred from October 4 to 6, 2016, and April 19 to 21, 2017, in accordance with the Sampling Plan (Amec Foster Wheeler 2015). Benthic macroinvertebrate and surface water samples were collected by Amec Foster Wheeler personnel from five locations in Prince William County: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch (Figures 1 through 5). The field team prepared Physical Characterization/Water Quality Field Data Sheets and Habitat Assessment Field Data Sheets for High Gradient Streams, as specified in USEPA Rapid Bioassessment Protocol (RBP) (Barbour et al. 1999; Appendix A). In-situ water quality data were collected using a YSI 556 water quality meter for dissolved oxygen (DO), pH, conductivity, and temperature. Turbidity was measured using a LaMotte 2020e meter in Nephelometric Turbidity Units (NTU).

Approximate stream width, water depth, and transparency (as measured with a Secchi disk) were measured in meters (m). Water velocity was measured with a Marsh-McBirney Flo-Mate current meter in meters per second (m/s). Upstream and downstream photographs were also taken for each site (Appendix A). Grab water samples were collected for ammonia, *Escherichia coli* (*E. coli*), nitrate/nitrite, orthophosphate, total Kjeldahl nitrogen (TKN), total nitrogen, total phosphorus, and total suspended solids (TSS) analyses.

Benthic macroinvertebrate sampling was conducted in accordance with the Sampling Plan. The multiple habitat sampling method was used for each of the sites. This method consists of a total of 20 jabs or kicks, taken from each major habitat type in the reach. Benthic macroinvertebrate samples were placed on ice in coolers and shipped overnight to Amec Foster Wheeler's benthic macroinvertebrate laboratory in Gainesville, Florida. The laboratory sorted, mounted, identified, enumerated, evaluated, and classified benthic macroinvertebrates according to Section 7.2 of the RBP (Barbour et al. 1999). Eight metrics were calculated including the Biotic Index (BI) from Hilsenhoff (1987); the Percent Model Affinity (PMA) from Novak and Bode (1992); and the Virginia Stream Condition Index (VSCI) using guidance from TetraTech (2003) and VDEQ (2008).

It should be noted that BI, PMA, and VSCI represent various ways to access stream condition; as a result, score categories will not always agree among assessments. BI estimates the overall tolerance of the community in a sampled area, weighted by the relative abundance of each taxonomic group (e.g., family), and the group's predetermined tolerance level. PMA is an index of percentage similarity, used to measure the affinity of various metrics (e.g., species richness) from the sample reach to that of the expected model community. VSCI is an index designed specifically for streams and small rivers in Virginia. The index utilizes eight scoring metrics, comparing monitored site metrics to the metrics of a designated reference condition.

3.0 RESULTS

Sampling was conducted from October 4 to 6, 2016, and from April 19 to 21, 2017 in accordance with the Sampling Plan and is summarized in the following sections.

3.1 FIELD CONDITION AND PARAMETER RESULTS

Assessing physical habitat quality is an integral component of the final evaluation of impairment. The RBP matrix used to assess habitat quality is based on 10 visual physical characteristics of the waterbody and surrounding land, particularly the catchment of the site under investigation. The habitat parameters evaluated are related to overall aquatic life use and are a potential source of limitation to the aquatic biota; the scoring of each of these characteristics is included as page 4 of the site datasheets in Appendix A, while score totals and the resulting condition categories are summarized in Table 1 for the fall 2016 event, and Table 2 for spring 2017 event. The RBP defines the following condition categories based on the physical habitat characterization scores, in an effort to determine the ability of the habitat to support an optimal biological community:

151-200	Optimal	The physical habitat present meets natural expectations, and is capable of supporting an optimal benthic community.
101-150	Suboptimal	Physical habitat is less than desirable, but satisfies expectations under most circumstances to support a benthic community.
51-100	Marginal	Physical habitat has moderate levels of degradation, with a severity at frequent intervals throughout the reach, which limit the capability of supporting a benthic community.
0-50	Poor	Physical habitat has been substantially altered with severe degradation to characteristics that would support a benthic community.

Water quality is also an integral component of stream evaluation and the ability of a stream to support biological communities. Surface waters should meet Virginia's Water Quality Standards, as outlined in Section 9VAC25-260. However, these standards represent limits not to be exceeded. For a general comparison, the following bullets summarize typical conditions for piedmont streams.

- A pH range of 6.5 to 8.0 standard units (SU) is optimal for most organisms, as a pH outside this range reduces the diversity in the stream because it stresses the physiological systems of most organisms and can reduce reproduction.
- Distilled water has conductivity in the range of 0.5 to 3 microsiemens per centimeter (µS/cm). The conductivity of streams generally range from 0 to 1500 µS/cm, while studies of inland fresh waters indicate that streams supporting mixed fisheries have a range between 50 and 500 µS/cm.

- Temperature affects feeding, reproduction and metabolism of aquatic animals. A week or two of high temperatures may make a stream unsuitable for sensitive aquatic organisms; the maximum temperature of nontidal (piedmont) streams should not exceed 32 degrees Celsius (°C).
- DO is an important measure of stream water quality, as aquatic organisms need DO to live. DO in the water varies greatly with stream characteristics, temperature, and time, but a minimal DO level of 5 milligrams per liter (mg/L) is usually required to maintain healthy growth and activity.
- Turbidity is a measure of water clarity, and though Virginia water quality standards do not include guidelines for turbidity, as a general guide, water begins to appear cloudy when the turbidity is greater than 5 NTU.

3.1.1 Fall Baseline

RBP physical habitat assessment scores ranged from 87 (Purcell Branch) to 147 (Dawkins Branch). The scores indicated that four of the five sites had suboptimal habitat for supporting benthic communities, while Purcell Branch had habitat that was marginal for supporting a benthic community.

As shown in Table 1, the physical water quality characteristics of the five sites meet the typical water quality conditions described above, with the exception of pH at Cow Branch; however, this pH meets Virginia's Water Quality Standards.

Table 1. Fall Baseline Field Condition and Parameter Results.

Parameter	Units	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Assessment/ Characterization Score	--	104	147	110	136	87
RBP Habitat Condition Category	--	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Marginal
pH	SU	6.29	7.43	7.70	7.11	6.88
Conductivity	µS/cm	0.374	0.348	0.639	0.178	0.188
Temperature	°C	17.63	20.37	16.32	18.04	15.93
DO	mg/L	9.19	7.37	8.60	10.50	9.59
Turbidity	NTU	1.55	3.89	1.16	4.18	1.26
Water Depth	m	0.13	0.15	0.17	0.15	0.13
Secchi Depth	m	0.13	0.15	0.17	0.15	0.13
Reach Length	m	100	100	100	100	100
Reach Width	m	5.5	5.2	7.7	9.1	9.2
Surface Velocity	m/s	0.24	0.40	0.49	0.20	0.33

Abbreviations:
-- = not applicable
°C = degrees Celsius
mg/L = milligrams per liter

Prepared by: KPH 7/12/17
Checked by: RRP 7/12/17

3.1.2 Spring 2017

RBP physical habitat assessment scores ranged from 94 (Little Bull Run) to 134 (Dawkins Branch). The scores indicated that three of the five sites had suboptimal habitat for supporting benthic communities, while Cow Branch and Little Bull Run habitats were marginal for supporting a benthic community.

As shown in Table 2, the physical water quality characteristics of the five sites meet the typical water quality conditions described above, with the exception of elevated pH at three sites; however, these pH values meet Virginia's Water Quality Standards.

Table 2. Spring 2017 Field Condition and Parameter Results.

Parameter	Units	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Assessment/ Characterization Score	--	98	134	94	123	108
RBP Habitat Condition Category	--	Marginal	Suboptimal	Marginal	Suboptimal	Suboptimal
pH	SU	6.68	8.44	7.65	8.05	8.03
Conductivity	µS/cm	0.781	1.031	0.942	0.205	0.383
Temperature	°C	14.78	23.63	18.27	15.89	20.07
DO	ppm	10.62	9.03	8.10	10.69	9.65
Turbidity	NTU	1.83	3.39	NA	1.78	1.07
Water Depth	m	0.13	0.076	0.18	0.23	0.11
Secchi Depth	m	0.13	0.076	0.18	0.23	0.11
Reach Length	m	100	100	100	100	100
Reach Width	m	3.0	3.5	6.1	6.2	5.3
Surface Velocity	m/s	0.12	0.30	0.34	0.35	0.19

Abbreviations:
NA = not available, value was not recorded
-- = not applicable
°C = degrees Celsius
mg/L = milligrams per liter

Prepared by: KPH 7/12/17
Checked by: RRP 7/12/17

3.2 WATER QUALITY LABORATORY RESULTS

The laboratory analytical reports are provided in Appendix B. As mentioned in the previous section, water quality is an integral component of stream evaluation and the ability of a stream to support biological communities. Surface waters should meet Virginia's Water Quality Standards, as outlined in Section 9VAC25-260. However, these standards represent limits, not to be exceeded. For a general comparison, the following bullets summarize typical conditions for piedmont streams.

- Ammonia is toxic to fish and other types of aquatic life. Ammonia's toxicity depends on both the temperature and pH of the water, but chronic levels above 3.0 mg/L exceed water quality standards.

- *E. coli* can be used as an indicator of stream impairment from sewage and animal waste. The Virginia Water Quality Standard is 126 most probable number of coliform per 100 milliliters (MPN/100mL).
- Nitrate stimulates plant growth, and excessive plant growth can impact DO levels. Streams in areas with little human impact have less than 0.6 mg/L nitrate, while the Virginia Water Quality Standard is 10 mg/L.
- Phosphates act as a nutrient for plant growth similar to nitrate. Streams in areas with little human impact have less than 0.1 mg/L. There is no Virginia Water Quality Standard for phosphate.
- TKN is the sum of organic nitrogen, ammonia, and ammonium. Though there is no Virginia Water Quality Standard for TKN, it can be used as an indicator for stream impairment.
- There are no Virginia Water Quality standards for total phosphorus or nitrogen. However, total phosphorus levels higher than 0.1 mg/L may stimulate plant growth sufficiently to surpass natural growth rates. Levels in excess of 0.1 mg/L indicate a potential human source such as industrial soaps, sewage, fertilizers, disturbance of soil, animal waste, or industrial effluent.
- TSS, similar to turbidity, is a quantitative method to measure sediment and other particles found in surface water. Though there is no Virginia Water Quality Standard for TSS, it can be used as an indicator for erosion and sedimentation.

3.2.1 Fall Baseline

As shown in Table 3, the water quality results for the five sites meet the typical water quality conditions described above, with exception of elevated *E. coli* levels, ranging from 98.8 to 727 MPN/100mL. Cow Branch, Dawkins Branch, and Purcell Branch were in excess of the Virginia Water Quality Standard of 126 MPN/100mL. Elevated *E. coli* levels are typically associated with sewage and animal waste.

Table 3. Fall Baseline Water Quality Results.

Parameter	Units	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Ammonia	mg/L	0.04	0.02	0.03	0.08	0.01
E. coli	MPN/100mL	**249**	**179**	98.8	114	**727**
Nitrate+Nitrite	mg/L	0.34	0.30	1.73	1.18	0.51
Orthophosphate	mg/L	<0.01	0.01	0.02	0.02	<0.01
TKN	mg/L	<0.50	0.50	<0.50	0.77	<0.50
Total Nitrogen	mg/L	0.59	0.80	1.98	1.95	0.76
Total Phosphorus	mg/L	0.02	0.01	<0.01	<0.01	<0.01
TSS	mg/L	<1.0	<1.0	1.2	3.7	<1.0

Abbreviations: *Prepared by: KPH 7/12/17*
< = not detected at the associated reporting limit *Checked by: RRP 7/12/17*
mg/L = milligrams per liter
***bold** indicates a result exceeding the VA water quality standards*

The laboratory analytical report for the fall 2016 sampling is provided in Appendix B.

3.2.2 Spring 2017

As shown in Table 4, the water quality results for the five sites meet the typical water quality conditions described above, with the exception of elevated *E. coli* at Little Bull Run, which had a result of 130 MPN/100mL in excess of the Virginia Water Quality Standard of 126 MPN/100mL. Elevated *E. coli* levels are typically associated with sewage and animal waste.

Table 4. Spring 2017 Water Quality Results.

Parameter	Units	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Ammonia	mg/L	0.02	0.04	0.03	<0.01	0.01
E. coli	MPN/100mL	22.8	14.6	**130**	12.1	13.2
Nitrate+Nitrite	mg/L	0.17	0.35	0.33	0.01	0.27
Orthophosphate	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
TKN	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Total Nitrogen	mg/L	0.42	0.55	0.58	0.26	0.52
Total Phosphorus	mg/L	0.01	0.05	0.01	0.02	0.01
TSS	mg/L	1.2	4.6	1.2	1.1	<1.0

Abbreviations: *Prepared by: KPH 7/12/17*
< = not detected at the associated reporting limit *Checked by: RRP 7/12/17*
mg/L = milligrams per liter
***bold** indicates a result exceeding the VA water quality standards*

The laboratory analytical report for the spring 2017 sampling is provided in Appendix B.

3.3 BENTHIC MACROINVERTEBRATE RESULTS

Terms such as “tolerant” and “intolerant” taxa are used to describe benthic communities in this document without the negative or positive lay connotations of such language. Tolerant taxa are

benthic species adapted to survive in a broad range of environmental conditions, whereas intolerant taxa are adapted to more limited range of environmental conditions. The term "impairment" has a negative connotation with its lay usage; in this document, the term is used to describe the nature and composition of a benthic community. The scientific "impairment" conditions are classified into four categories:

No Impairment	Similar to the reference conditions; the benthic community is of excellent quality.
Slight Impairment	Sustaining a diverse and abundant benthic community with some intolerant taxa; the benthic community is of good quality.
Moderate Impairment	Not having a highly diverse and abundant community, but having taxa present in several major groups, generally a few intolerant taxa and one taxa being dominant; the community has been impacted.
Severe Impairment	Few, if any, benthic invertebrate taxa are present, all tolerant taxa, low diversity, and often one taxa is very abundant; the benthic community has been severely impacted.

Amec Foster Wheeler's laboratory sorted and identified the organisms in the benthic macroinvertebrate samples and provided reports dated December 2, 2016 and June 16, 2017 for the fall 2016 and the spring 2017 sampling events, respectively (Appendix C). The results of the sampling are provided in the Tables 5 and 6 below and summarized in this section.

3.3.1 Fall Baseline

A total of 56 taxa were identified from the fall samples. Among the five sites, taxa richness ranged from 11 to 26, while abundance ranged from 165 to 220. This metric indicated slight impairment for Dawkins Branch and Neabsco Creek, and moderate impairment for Cow Branch.

EPT taxa ranged from 3 to 5 among the sites. This metric indicated slight impairment for Little Bull Run and Purcell Branch; the remaining sites indicated moderate impairment.

The percentage of the top taxa ranged from 17.96% to 55.76%. Percentage of the top two taxa combined, which is a VSCI metric, ranged from 39.55% to 65.45%, indicating no impairment for Little Bull Run and Purcell Branch, slight impairment for Cow Branch and Dawkins Branch, and moderate impairment for Neabsco Creek.

The percentage of Chironomidae showed no impairment. The biological scores for the percentage of scrapers showed no impairment for Dawkins Branch, moderate impairment to Little Bull Run and Purcell Branch, and severe impairment for Cow Branch and Neabsco Creek.

The BI ranged from 5.42 to 6.06 for the sites, with corresponding BI Category scores of "fair" for the sites, with the exception of "good" for Cow Branch. The PMA ranged from 37.38 to 63.78 for

the sites, with corresponding PMA Category scores of "moderately impacted" for Dawkins Branch and Little Bull Run, and "slightly impacted" for the remaining sites.

Results from the calculation of the VSCI for the individual sample sites ranged from 36.54 (Cow Branch) to 57.34 (Purcell Branch), with an average VSCI score of 47.86 among the sites. This corresponds to "stress" stream quality conditions under the VSCI assessment, though Cow Branch and Neabsco Creek did indicate a "severe stress" stream quality condition.

Table 5. Fall Baseline Benthic Macroinvertebrate Results.

Metric	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Taxa Richness	11	16	25	15	26
Abundance	168	220	206	165	205
EPT Index	3	4	5	4	5
EPT/EPT+ Chironomidae	0.21	0.33	0.71	0.31	0.14
Percent Dominant Taxon	39.29	39.09	17.96	55.76	25.37
Percent Chironomidae	6.55	3.64	0.97	5.45	15.61
BI	5.42	6.06	5.91	6.01	5.67
BI Category	Good	Fair	Fair	Fair	Fair
PMA	57.74	41.82	37.38	62.42	63.78
PMA Category	Slightly Impacted	Moderately Impacted	Moderately Impacted	Slightly Impacted	Slightly Impacted
VSCI	36.54	49.42	56.59	39.44	57.34
VSCI Category	Severe Stress	Stress	Stress	Severe Stress	Stress

Abbreviations:
BI = Biotic Index
EPT = Ephemeroptera, Plecoptera, and Tricoptera
PMA = percent model affinity
VSCI = Virginia Stream Condition Index

Prepared by: KPH 7/12/17
Checked by: RRP 7/12/17

3.3.2 Spring 2017

A total of 63 taxa were identified from the spring samples. Among the five sites, taxa richness ranged from 22 to 33, while abundance ranged from 161 to 193. This metric indicated no impairment for the samples.

EPT taxa ranged from 2 to 6 among the sites. This metric indicated slight impairment for Neabsco Creek, moderate impairment for Cow Branch, Dawkins Branch and Purcell Branch, severe impairment for Little Bull Run.

The percentage of the top taxa ranged from 17.39% to 47.37%. Percentage of the top two taxa combined, which is a VSCI metric, ranged from 34.16% to 61.58%, indicating slight impairment for Cow Branch and Dawkins Branch, and no impairment for the remaining sites.

The percentage of Chironomidae showed slight impairment for Cow Branch, and moderate impairment for the remaining sites. The biological scores for the percentage of scrapers showed severe impairment the sampling sites.

The BI ranged from 5.15 to 6.54 for the sites, with corresponding BI Category scores of "good" for Purcell Branch and Dawkins Branch, and "fair" for Little Bull Run and Neabsco Creek, and "fairly poor" for Cow Branch. The PMA ranged from 37.42 to 50.79 for the sites, with corresponding PMA Category scores of "moderately impacted" for the sites, with the exception of Dawkins Branch, which was "slightly impacted".

Results from the calculation of the VSCI for the individual sample sites ranged from 37.17 (Cow Branch) to 47.03 (Neabsco Creek), with an average VSCI score of 40.88 among the sites. This corresponds to "severe stress" stream quality conditions under the VSCI assessment, though Neabsco Creek did indicate a "stress" stream quality condition.

Table 6. Spring 2017 Benthic Macroinvertebrate Results.

Metric	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Taxa Richness	22	24	27	33	28
Abundance	161	190	193	161	167
EPT Index	3	5	2	6	4
EPT/EPT+ Chironomidae	0.14	0.09	0.08	0.22	0.03
Percent Dominant Taxon	42.24	47.37	28.50	17.39	26.95
Percent Chironomidae	43.48	61.05	57.51	51.55	68.26
BI	6.54	5.15	6.10	5.96	5.28
BI Category	Fairly Poor	Good	Fair	Fair	Good
PMA	37.42	50.79	49.33	48.91	39.67
PMA Category	Moderately Impacted	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted
VSCI	37.17	39.85	38.66	47.03	41.71
VSCI Category	Severe Stress	Severe Stress	Severe Stress	Stress	Severe Stress

Abbreviations:
BI = Biotic Index
EPT = Ephemeroptera, Plecoptera, and Tricoptera
PMA = percent model affinity
VSCI = Virginia Stream Condition Index

Prepared by: KPH 7/12/17
Checked by: RRP 7/12/17

4.0 SUMMARY AND CONCLUSIONS

The following sections present a summary of the fall 2016 (fall baseline) and spring 2017 sampling events, and compare the results with the baseline sampling event conducted in spring 2016 (spring baseline). This section also provides conclusions for the current report period. It should be noted that there are biological changes associated with seasonality, with taxa emerging in the spring, and transitional life stages (e.g., metamorphosis) during and between events that may account for benthic community dynamics. However, the 2016 fall and spring events represent baseline sampling, and a full year (2017) of monitoring samples for comparison has not been completed. This report completes the establishment of baseline conditions (2016 results); subsequent reports will provide data necessary for baseline comparisons to address potential seasonal changes.

4.1 SUMMARY

4.1.1 Fall Baseline

Measured field and laboratory water quality parameters are generally within the normal ranges for shallow, cool, turbulent, piedmont Virginia streams, and generally meet Virginia's Water Quality Standards, as outlined in Section 3. However, there were elevated *E. coli* levels at all of the sites, and three sites had levels above the Virginia Water Quality standard, which could be indicative of sewage or animal waste. In addition, the physical habitat assessments and biological evaluations indicated impaired habitats and stressed benthic macroinvertebrate communities.

The RBP physical habitat assessments that will be used as a baseline for subsequent monitoring indicated suboptimal habitats at all the sites, with the exception of Purcell Branch, which indicated marginal habitat. The "suboptimal" category indicates that the habitat criteria are less than desirable, but that the criteria satisfy expectations under most circumstances; the "marginal" category indicates a moderate level of degradation, with severity at frequent intervals throughout the reach that do not satisfy expectations.

Though the "suboptimal" habitat assessment rating indicated that four of the sites could support satisfactory benthic invertebrate communities under most circumstances, the benthic invertebrate community measures showed that there was moderate to severe impairment to the benthos at all five sites, closer in agreement with the "marginal" category that was received for Purcell Branch. The results specified that though habitat assessments indicated the possibility of normal benthic communities at four of the five sites, the benthic communities present were found to be under stress or severe stress for all five sites. Based on the biological scores, the

habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County.

4.1.2 Spring 2017

Measured field and laboratory water quality parameters are generally within the normal ranges for shallow, cool, turbulent, piedmont Virginia streams, and generally meet Virginia's Water Quality Standards, as outlined in Section 3. However, the *E. coli* levels at Little Bull Run were above the Virginia Water Quality standard, which could be indicative of sewage or animal waste. In addition, the physical habitat assessments and biological evaluations indicated impaired habitats and stressed benthic macroinvertebrate communities among the sites.

The RBP physical habitat assessments that will be used as a baseline for subsequent monitoring indicated suboptimal habitats for Dawkins Branch, Neabsco Creek, and Purcell Branch, while Cow Branch and Little Bull Run indicated marginal habitats.

Though the "suboptimal" habitat assessment rating indicated that three of the sites could support satisfactory benthic invertebrate communities under most circumstances, the benthic invertebrate community measures showed that there was moderate to severe impairment to the benthos at the sites, closer in agreement with the "marginal" category, with the exception of Neabsco Creek which indicated stressed or moderately impacted communities. The results specified that though habitat assessments indicated the possibility of normal benthic communities at four of the five sites, the benthic communities present were found to be under stress or severe stress for all five sites. Based on the biological scores, the habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County.

4.2 COMPARISON TO SPRING BASELINE RESULTS

In the assessment of measured field and laboratory water quality parameters, the fall 2016 (fall baseline) and spring 2017 sampling results are generally comparable to the spring baseline sampling results from 2016, are within the normal ranges, and are below Virginia's Water Quality Standards, with the exception of *E. coli* results. From spring to fall 2016, average *E. coli* results among the sites increased from 55.3 to 273.6 MPN/100mL, and went from no site exceedances to three of the five sites in excess of the Virginia Water Quality Standard of 126 MPN/100mL. From fall 2016 to spring 2017, the average results fell to 38.5 MPN/100mL, below the baseline average, but still had an exceedance at Little Bull Run.

The habitat and benthic community results among the events are summarized below in Table 7. The RBP physical habitat assessments indicated habitat at Dawkins Branch and Neabsco Creek did not change from baseline. Cow Branch and Purcell Branch also remained relatively unchanged, though variable in condition category (scores are similar, but on the line between categories). However, the habitat at Little Bull Run has shown a gradual decline. Generally, the sites are suboptimal or marginal for supporting benthic invertebrate communities.

The BI category is variable among events between "Fair" and "Good" for all of the sites, with the exception of the spring 2017 sampling at Cow Branch, which resulted in a "Fairly Poor" category score.

Table 7. Habitat and Benthic Community Comparison Summary

Parameter	Event	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Score	Baseline (Spring)	94	126	120	134	103
	Baseline (Fall)	104	147	110	136	87
	2017 (Spring)	98	134	94	123	108
RBP Habitat Category	Baseline (Spring)	Marginal	Suboptimal	Suboptimal	Suboptimal	Suboptimal
	Baseline (Fall)	Suboptimal	Suboptimal	Suboptimal	Suboptimal	Marginal
	2017 (Spring)	Marginal	Suboptimal	Marginal	Suboptimal	Suboptimal
BI Category	Baseline (Spring)	Fair	Fair	Good	Good	Good
	Baseline (Fall)	Good	Fair	Fair	Fair	Fair
	2017 (Spring)	Fairly Poor	Good	Fair	Fair	Good
PMA Category	Baseline (Spring)	Severely Impacted	Moderately Impacted	Moderately Impacted	Severely Impacted	Moderately Impacted
	Baseline (Fall)	Slightly Impacted	Moderately Impacted	Moderately Impacted	Slightly Impacted	Slightly Impacted
	2017 (Spring)	Moderately Impacted	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted
VSCI Score	Baseline (Spring)	27.85	35.67	39.29	32.96	46.40
	Baseline (Fall)	36.54	49.42	56.59	39.44	57.34
	2017 (Spring)	37.17	39.85	38.66	47.03	41.71
VSCI Category	Baseline (Spring)	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Stress
	Baseline (Fall)	Severe Stress	Stress	Stress	Severe Stress	Stress
	2017 (Spring)	Severe Stress	Severe Stress	Severe Stress	Stress	Severe Stress

Prepared by: KPH 7/14/17
Checked by: RRP 7/17/17

The PMA category has marginally improved from baseline; two of the five sites received scores of "Severely Impacted" during the baseline sampling. The remaining sites, and subsequent

sampling among events since the baseline sampling, have scored variably, but as “Moderately Impacted” or “Slightly Impacted”.

VSCI scores are variable, but with little change, among baseline and subsequent events, as the scoring category has remained as “Stress” or “Severe Stress”. However, the average VSCI score has slightly increased, from an average baseline score of 36.43, to scores of 47.86 and 40.88 for the fall 2016 and spring 2017 sampling events, respectively.

4.3 CONCLUSIONS

The measured field and laboratory water quality parameters from the fall 2016 and spring 2017 sampling results are generally comparable to the baseline sampling results, are within the normal ranges, and are below Virginia’s Water Quality Standards, with the exception of the *E. coli* results. The elevated *E. coli* results and water quality standard exceedances subsequent to the baseline sampling may indicate sewage or animal waste impacts to streams. Elevated *E. coli* results are often associated with storm events, which may explain the variability between events.

Based on the biological scores, the habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County, which is generally unchanged from baseline sampling. Though slight negative and positive changes were noted in scores, scoring categories generally did not change. Future sampling events may provide the data scale necessary to indicate changes that are occurring long-term, as well as addressing seasonal changes to the benthic community.

Based on the fall baseline and spring 2017 sampling results, stream conditions do not appear to show significant change, positive or negative, from the spring baseline sampling results. Based on Virginia’s VSCI, the five study sites remain under “Stress” or “Severe Stress”.

5.0 REFERENCES

Amec Foster Wheeler, 2015. Sampling Plan for Benthic Macroinvertebrate and Water Quality Monitoring, Prince William County, Virginia. December 29, 2015.

Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling, 1999. Rapid bioassessment protocols for use in streams and wadeable rivers: periphyton, benthic macroinvertebrates, and fish. 2nd ed. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Hilsenhoff, W. L., 1987. An improved biotic index of organic stream pollution. The Great Lakes Entomologist. 20:31-39.

Novak, M. A. and R. W. Bode. 1992. Percent model affinity: a new measure of macroinvertebrate community composition. Journal of North American Benthological Society 11 (1): 80-85.

TetraTech, 2003. A Stream Condition Index for Virginia Non-Coastal Streams. Owings Mill, MD. September 2003.

VDEQ, 2008. Biological Monitoring Program Quality Assurance Project Plan for Wadeable Streams and Rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, VA. August 2008. Available at: http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterQualityMonitoring/BiologicalMonitoring/BioMonQAPP_13Aug2008.pdf.

Virginia's Legislative Information System (LIS). 2017. 9VAC25-260-50. Numerical Criteria for Dissolved Oxygen, Ph, and Maximum Temperature. Available at: http://law.lis.virginia.gov/admincode/title9/agency25/chapter260/section50/. Accessed July 12, 2017.

FIGURES

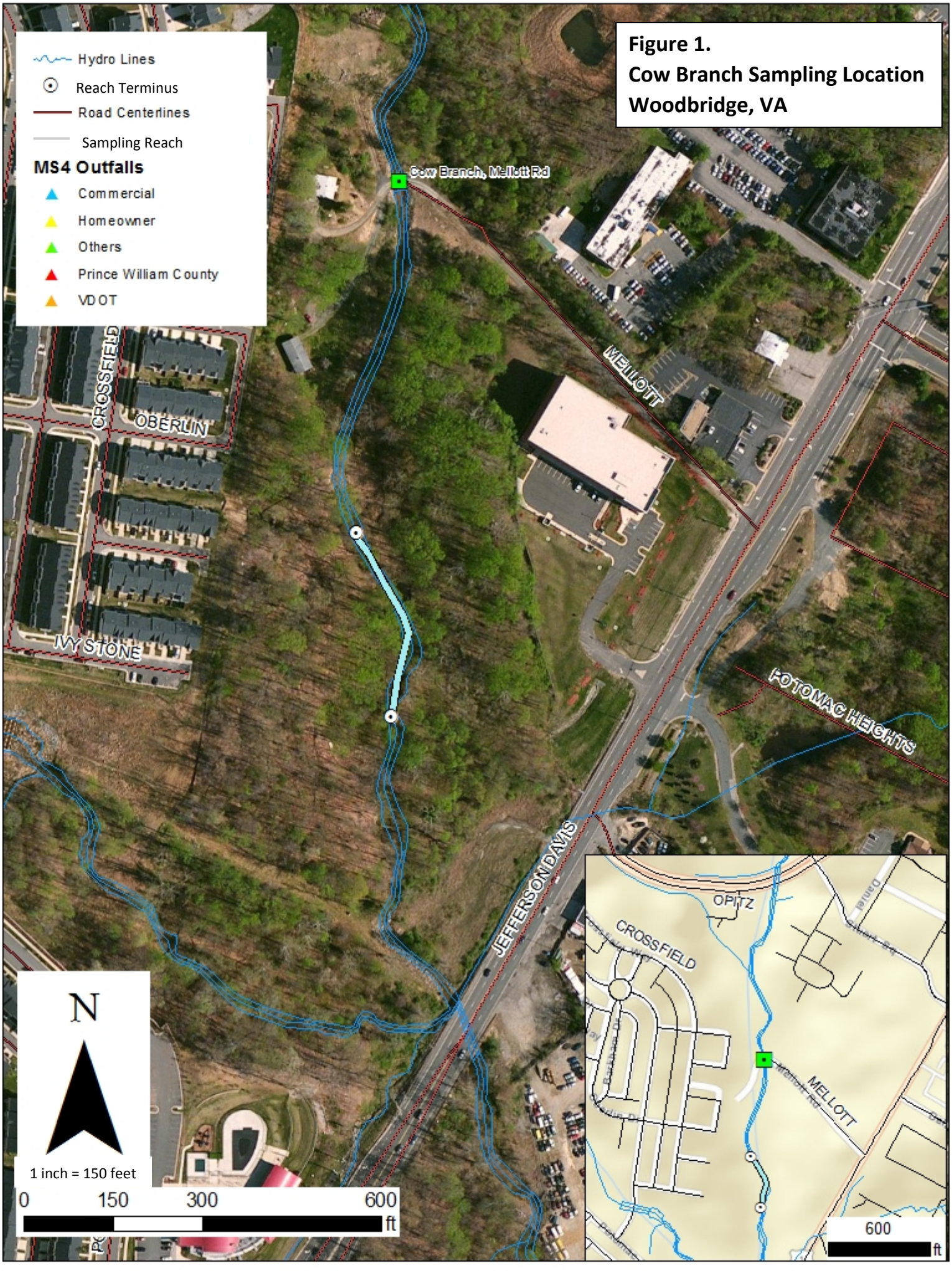


Figure 1.
Cow Branch Sampling Location
Woodbridge, VA

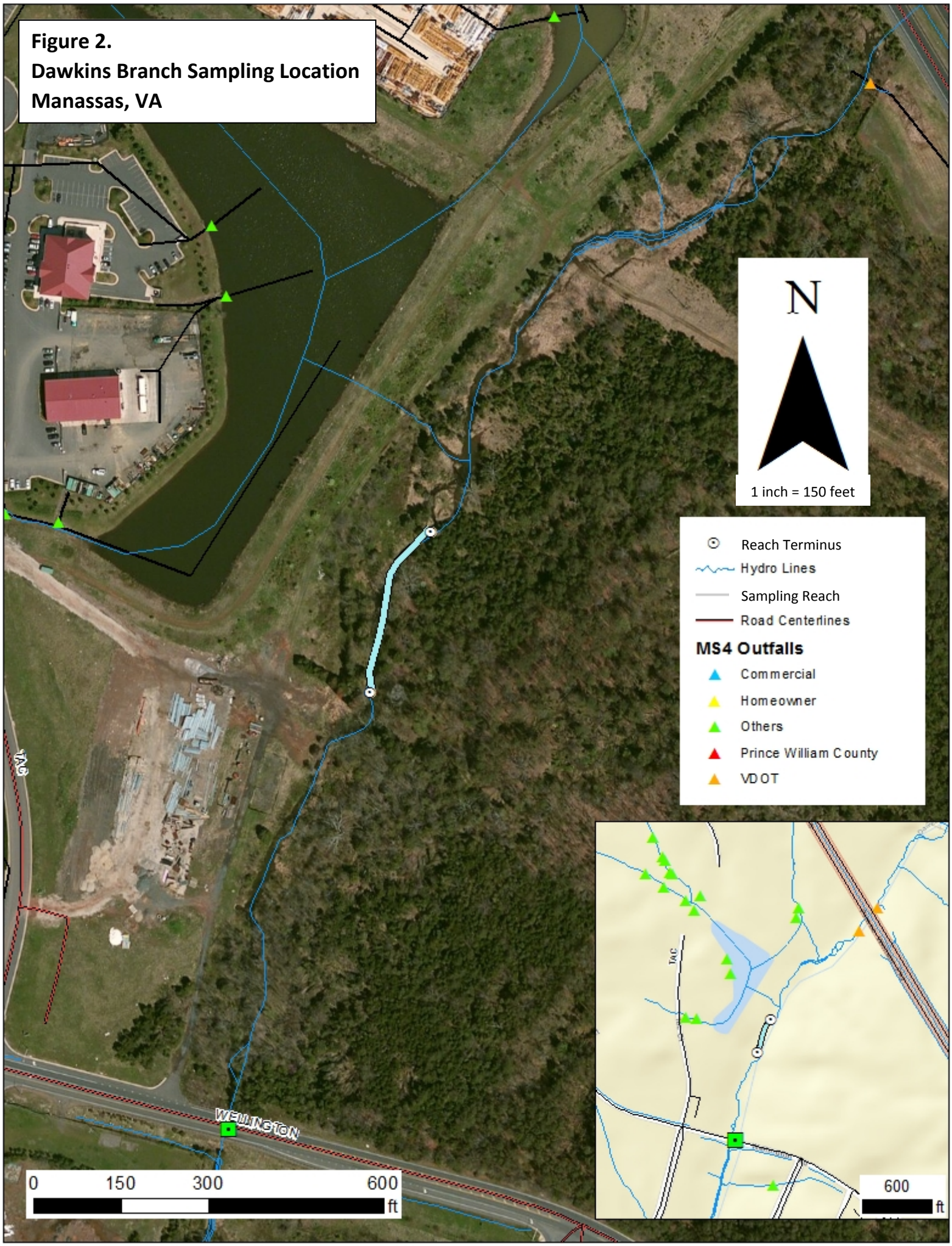


Figure 2.
Dawkins Branch Sampling Location
Manassas, VA
N
1 inch = 150 feet
Reach Terminus
Hydro Lines
Sampling Reach
Road Centerlines
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
WELLINGTON
0
150
300
600
ft
600
ft

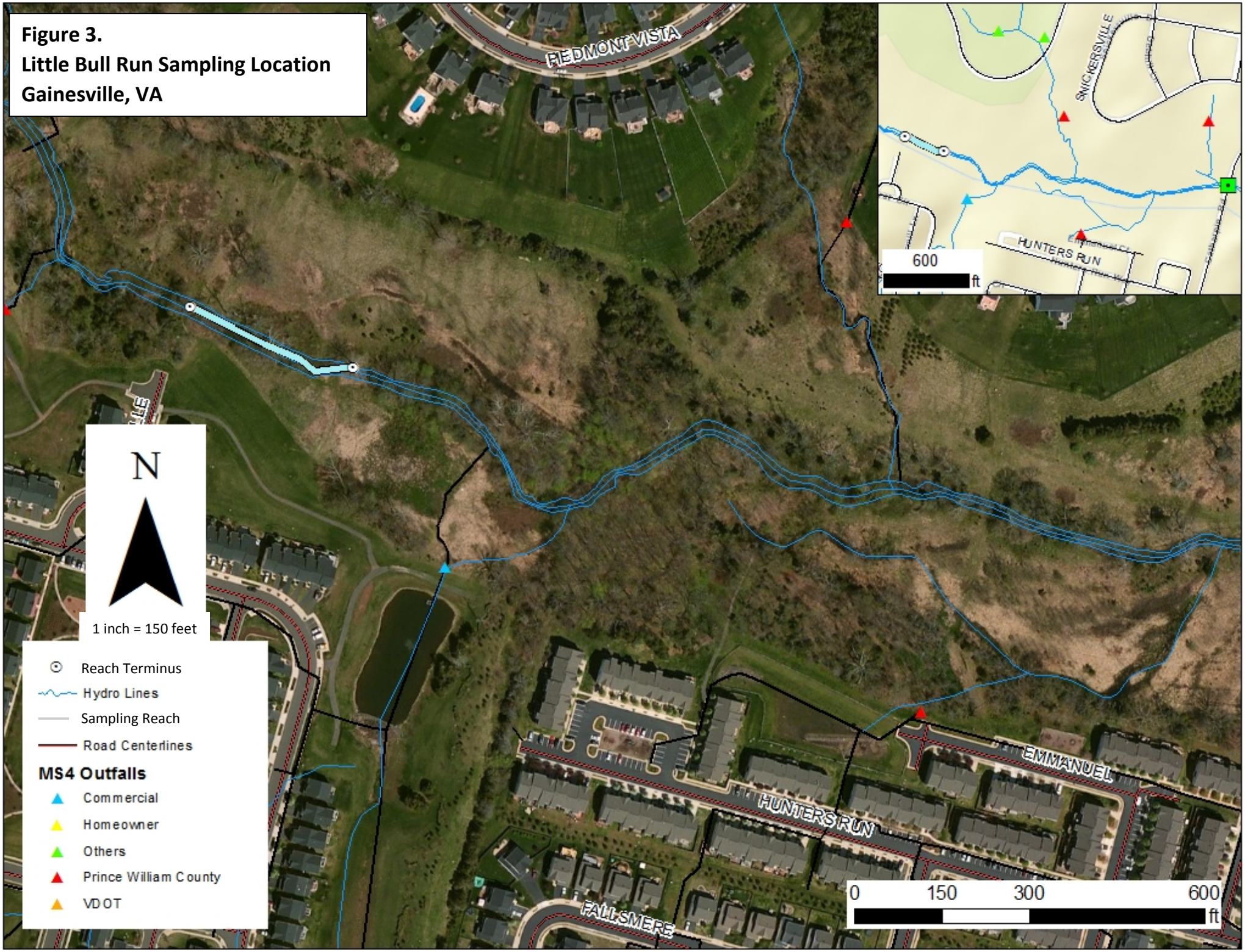
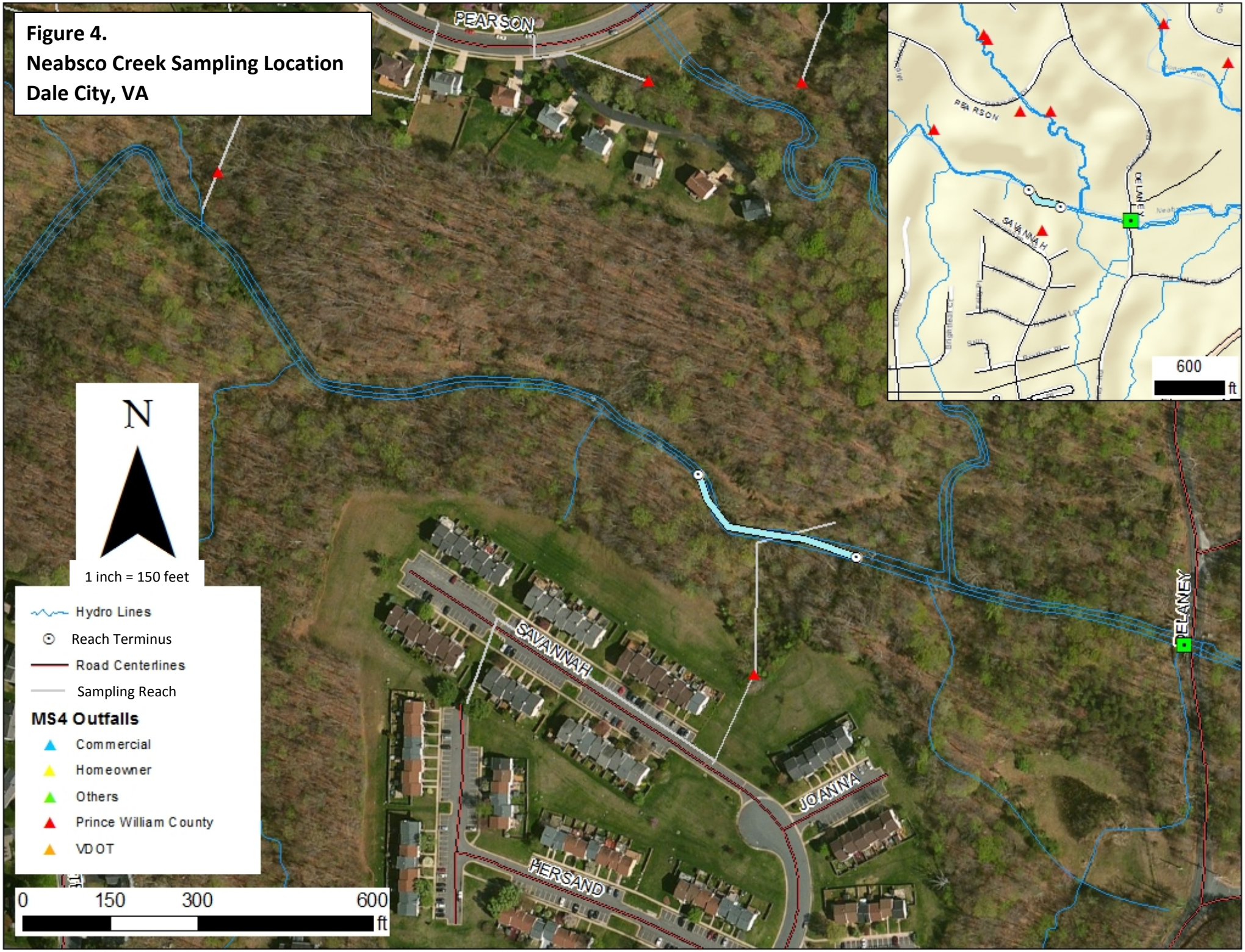


Figure 3.
Little Bull Run Sampling Location
Gainesville, VA
PIEDMONT VISTA
SNICKERSVILLE
HUNTERS RUN
600
ft
N
1 inch = 150 feet
Reach Terminus
Hydro Lines
Sampling Reach
Road Centerlines
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
HUNTERS RUN
EMMANUEL
FALLSMERE
0
150
300
600
ft

Figure 4.
Neabsco Creek Sampling Location
Dale City, VA



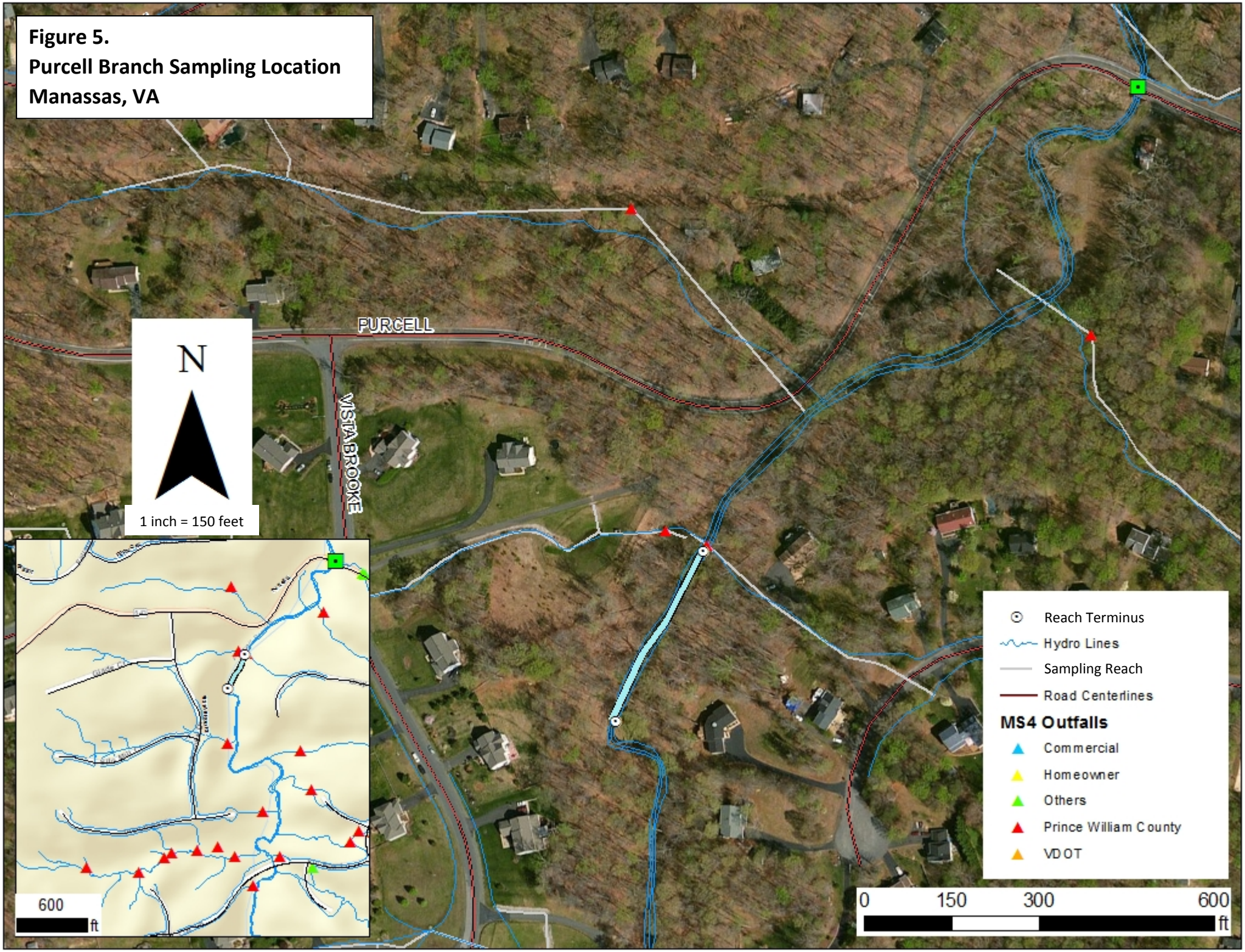


Figure 5.
Purcell Branch Sampling Location
Manassas, VA
PURCELL
VISTA BROOKE
N
1 inch = 150 feet
600
ft
Reach Terminus
Hydro Lines
Sampling Reach
Road Centerlines
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
0
150
300
600
ft

APPENDIX A

SITE DATA SHEETS

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Prince William Biological Monitoring Form

Stream Name	Neabsco Creek
Location	Dale City, VA
River Basin	Potomac
Investigators	Ben Green and John Miller
Date	10/04/2016
Time	01:43:05 PM GMT-04:00
Reason for Survey	PWC Biomonitoring
Weather Conditions	Clear / Sunny

GPS location

RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Trees

INSTREAM FEATURES

Est. Stream Width (m)	9.068
Est. Stream Depth (m)	0.1524
Surface Velocity (m/sec at thalweg)	0.2
Canopy Cover	Shaded
High Water Mark (m)	0.686
Channelized	○ Yes ◉ No
Dam Present	○ Yes ◉ No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	50
Run (%)	35
Pool (%)	15

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	5

WATER QUALITY

Temperature	18.04
Specific Conductance	0.178
Dissolved Oxygen	10.5
pH	7.11
Turbidity	4.18
WQ Instrument Used	YSI
Water Odors	☐ Normal / None ☑ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		10.0
Boulder	**>256 mm** (10")	40.0
Cobble	**64 - 256 mm** (2.5" - 10")	20.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	10.0
Sand	**0.06 - 2 mm** (gritty)	20.0
Silt	**0.004 - 0.06 mm**	
Clay	(slick)	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	18
Embeddedness	11
Velocity / Depth Regime	18
Sediment Deposition	12
Channel Flow Status	11

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	14
Frequency of Riffles (or Bends)	13
Bank Stability (LEFT BANK)	5
Bank Stability (RIGHT BANK)	6
Vegetative Protection (LEFT BANK)	6
Vegetative Protection (RIGHT BANK)	5
Riparian Vegetative Zone Width (LEFT BANK)	7
Riparian Vegetative Zone Width (RIGHT BANK)	10

Field Photography

Image 1

Caption for Image 1

Downstream of sample reach

Image 2

Caption for Image 2

Downstream marker

Image 3

Caption for Image 3

Upstream extent, orange marker on left

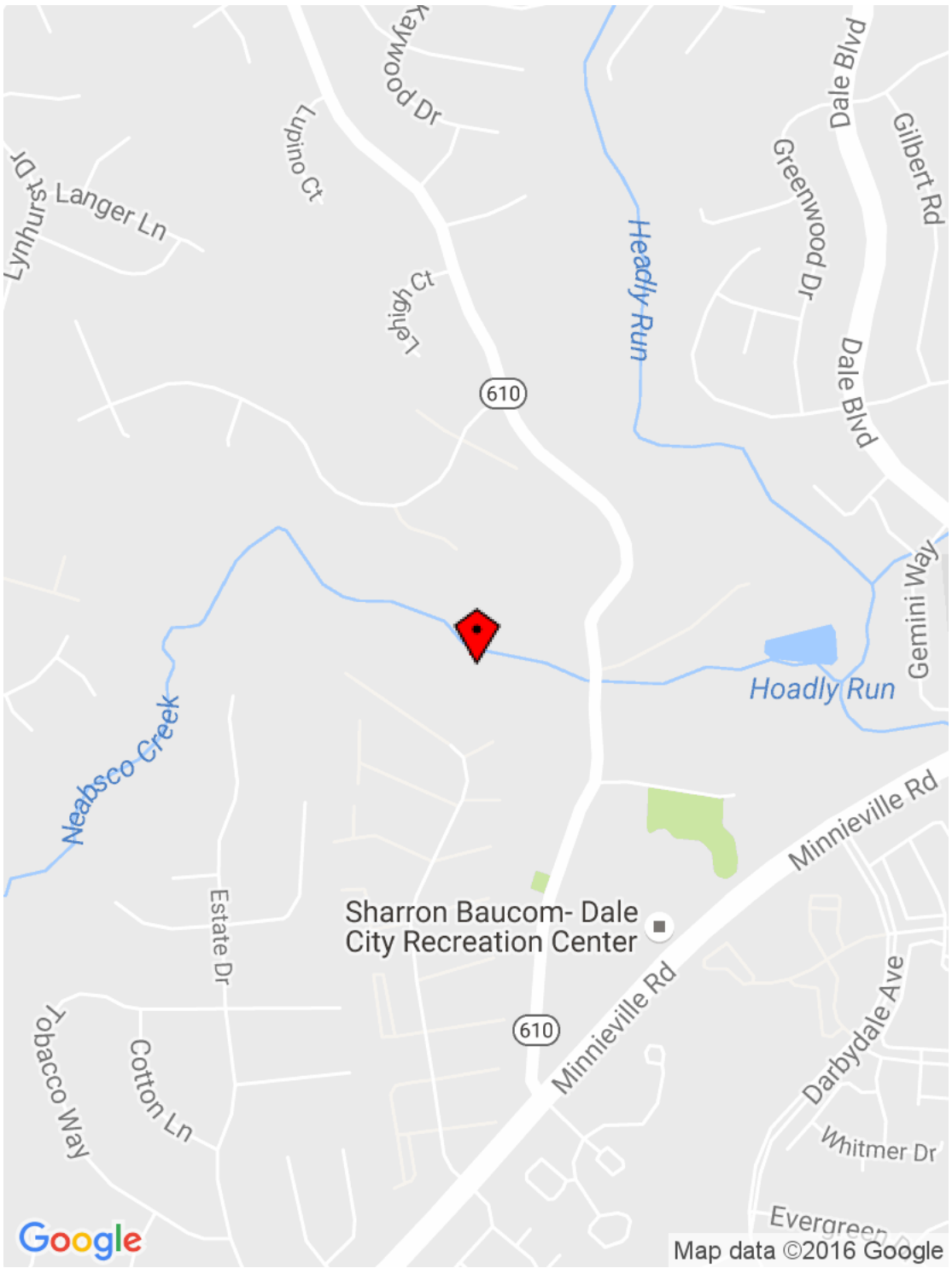
Report completed by:
John Miller

Signature


Signature Date/Time
10/04/2016 03:30:30 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map



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Prince William Biological Monitoring Form

Stream Name	Purcell Branch
Location	Manassas
River Basin	Potomac
Investigators	Ben Green and John Miller
Date	10/05/2016
Time	03:59:52 PM GMT-04:00
Reason for Survey	PWC Biological Monitoring
Weather Conditions	Clear / Sunny

GPS location

RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Trees

INSTREAM FEATURES

Est. Stream Width (m)	9.15
Est. Stream Depth (m)	0.127
Surface Velocity (m/sec at thalweg)	0.33
Canopy Cover	Shaded
High Water Mark (m)	0.737
Channelized	○ Yes ◉ No
Dam Present	○ Yes ◉ No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	65
Run (%)	30
Pool (%)	5

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	5

WATER QUALITY

Temperature	15.93
Specific Conductance	0.188
Dissolved Oxygen	9.59
pH	6.88
Turbidity	1.26
WQ Instrument Used	YSI
Water Odors	☑ Normal / None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		30.0
Boulder	**>256 mm** (10")	15.0
Cobble	**64 - 256 mm** (2.5" - 10")	25.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	10.0
Sand	**0.06 - 2 mm** (gritty)	20.0
Silt	**0.004 - 0.06 mm**	
Clay	(slick)	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	11
Embeddedness	6
Velocity / Depth Regime	10
Sediment Deposition	6
Channel Flow Status	8

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	8
Frequency of Riffles (or Bends)	7
Bank Stability (LEFT BANK)	3
Bank Stability (RIGHT BANK)	4
Vegetative Protection (LEFT BANK)	5
Vegetative Protection (RIGHT BANK)	5
Riparian Vegetative Zone Width (LEFT BANK)	8
Riparian Vegetative Zone Width (RIGHT BANK)	6

Field Photography

Image 1

Caption for Image 1

Downstream, marker on left

Image 2

Caption for Image 2

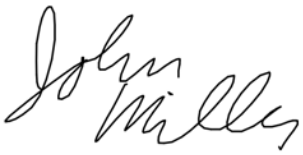
Upstream extent, marker on right at bend

Image 3

Caption for Image 3

Sampling reach

Report completed by:
John Miller

Signature


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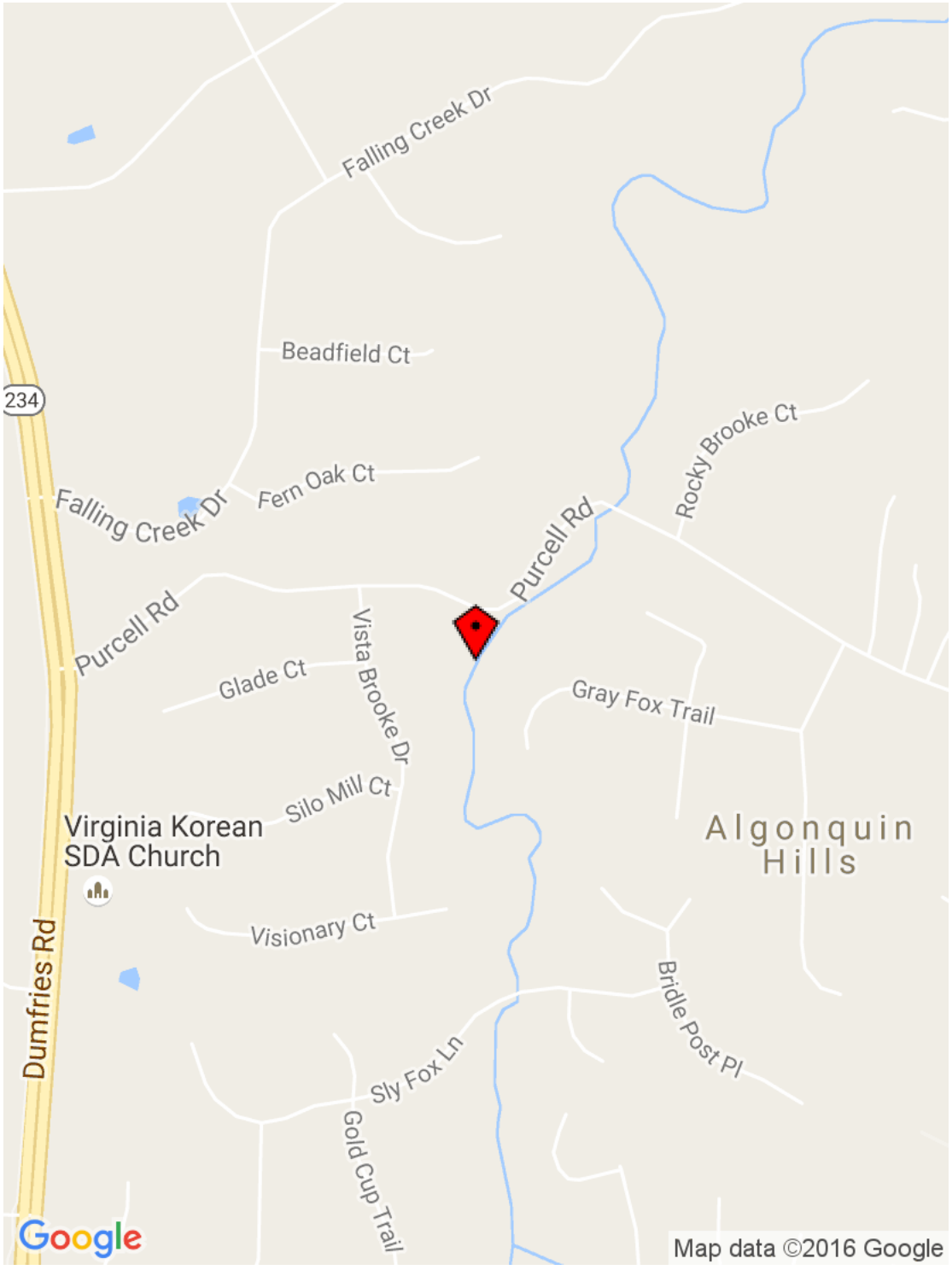
Location Map



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Prince William Biological Monitoring Form

Stream Name	Cow Branch
Location	Woodbridge, VA
River Basin	Potomac
Investigators	Ben Green and John Miller
Date	10/05/2016
Time	08:57:27 AM GMT-04:00
Reason for Survey	Biological
Weather Conditions	Clear / Sunny

GPS location

RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Grasses

INSTREAM FEATURES

Est. Stream Width (m)	5.48
Est. Stream Depth (m)	0.127
Surface Velocity (m/sec at thalweg)	0.24
Canopy Cover	Partly shaded
High Water Mark (m)	1.27
Channelized	(•) Yes ( ) No
Dam Present	( ) Yes (•) No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	35
Run (%)	55
Pool (%)	10

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	5

WATER QUALITY

Temperature	17.63
Specific Conductance	0.374
Dissolved Oxygen	9.19
pH	6.29
Turbidity	1.55
WQ Instrument Used	YSI
Water Odors	[x] Normal / None [ ] Sewage [ ] Petroleum [ ] Chemical [ ] Fishy [ ] Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		
Boulder	**>256 mm** (10")	10.0
Cobble	**64 - 256 mm** (2.5" - 10")	40.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	30.0
Sand	**0.06 - 2 mm** (gritty)	20.0
Silt	**0.004 - 0.06 mm**	
Clay	(slick)	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	7
Embeddedness	9
Velocity / Depth Regime	10
Sediment Deposition	10
Channel Flow Status	9

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	5
Frequency of Riffles (or Bends)	8
Bank Stability (LEFT BANK)	9
Bank Stability (RIGHT BANK)	9
Vegetative Protection (LEFT BANK)	6
Vegetative Protection (RIGHT BANK)	6
Riparian Vegetative Zone Width (LEFT BANK)	7
Riparian Vegetative Zone Width (RIGHT BANK)	9

Field Photography

Image 1

Caption for Image 1
Downstream

Image 2

Caption for Image 2
Upstream

Image 3

Caption for Image 3
U/S start of reach

Image 4

Caption for Image 4
D/S start of reach

Report completed by:
John Miller

Signature


Signature Date/Time
10/04/2016 10:47:54 AM GMT-04:00

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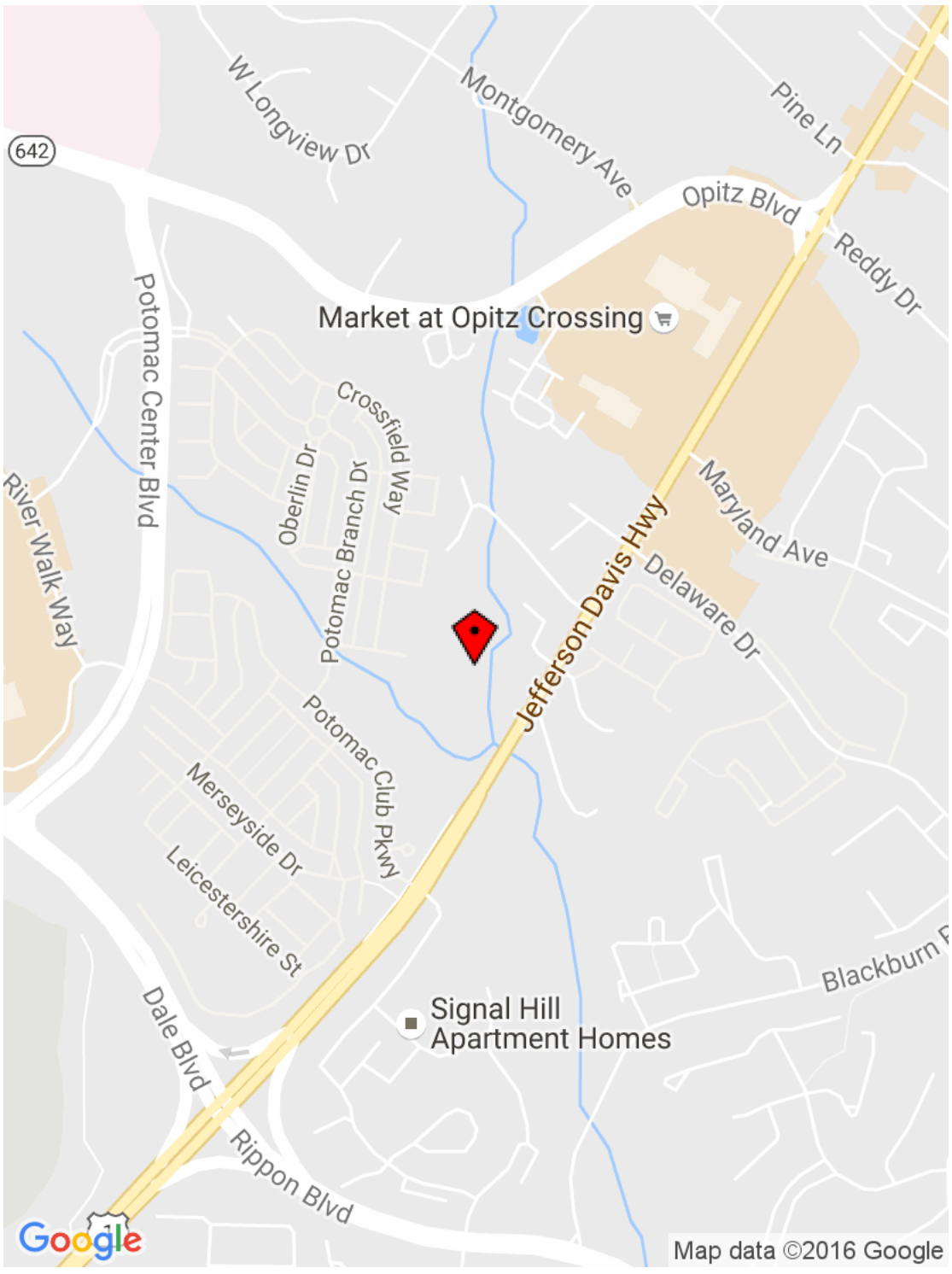
Location Map



amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Dawkins Bramch
Location	Manassas, VA
River Basin	Potomac
Investigators	Ben Green and John Miller
Date	10/05/2016
Time	04:01:41 PM GMT-04:00
Reason for Survey	Biological monitoring
Weather Conditions	Clear / Sunny

RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	5.2
Est. Stream Depth (m)	0.15
Surface Velocity (m/sec at thalweg)	0.4
Canopy Cover	Partly shaded
High Water Mark (m)	0.61
Channelized	○ Yes ◉ No
Dam Present	○ Yes ◉ No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	33
Run (%)	60
Pool (%)	7

AQUATIC VEGETATION

Dominant Type	Rooted emergent
Portion of reach with aquatic veg	40

WATER QUALITY

Temperature	20.37
Specific Conductance	0.348
Dissolved Oxygen	7.37
pH	7.43
Turbidity	3.89
WQ Instrument Used	YSI556
Water Odors	☑ Normal / None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		15.0
Boulder	**>256 mm** (10")	5.0
Cobble	**64 - 256 mm** (2.5" - 10")	40.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	15.0
Sand	**0.06 - 2 mm** (gritty)	5.0
Silt	**0.004 - 0.06 mm**	15.0
Clay	(slick)	5.0

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	18
Embeddedness	12
Velocity / Depth Regime	13
Sediment Deposition	14
Channel Flow Status	16

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	14
Frequency of Riffles (or Bends)	8
Bank Stability (LEFT BANK)	9
Bank Stability (RIGHT BANK)	9
Vegetative Protection (LEFT BANK)	9
Vegetative Protection (RIGHT BANK)	9
Riparian Vegetative Zone Width (LEFT BANK)	9
Riparian Vegetative Zone Width (RIGHT BANK)	7

Field Photography

Image 1

Caption for Image 1

Upstream at end of reach. Marker on right

Image 2

Caption for Image 2

Downstream at upper end of reach

Image 3

Caption for Image 3

Upstream from bottom of reach. Marker on right

Image 4

Caption for Image 4

Downstream from bottom of reach.

Report completed by:
Ben Green

Signature


Signature Date/Time
10/05/2016 03:08:26 PM GMT-04:00

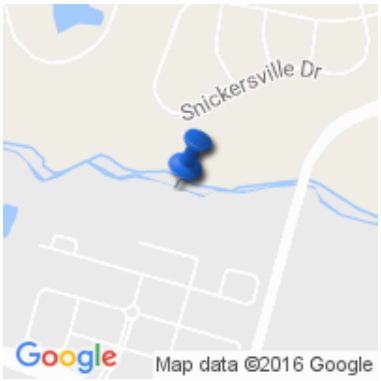
Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Little Bull Run
Location	Gainesville, VA
River Basin	Bull Run
Investigators	Ben Green and John Miller
Date	10/06/2016
Time	04:39:36 PM GMT-04:00
Reason for Survey	Biological monitoring
Weather Conditions	% Cloud Cover 100

GPS location



RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	7.7
Est. Stream Depth (m)	0.17
Surface Velocity (m/sec at thalweg)	0.49
Canopy Cover	Partly shaded
High Water Mark (m)	1.04
Channelized	○ Yes ◉ No
Dam Present	○ Yes ◉ No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	35
Run (%)	50
Pool (%)	15

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	90

WATER QUALITY

Temperature	16.32
Specific Conductance	0.639
Dissolved Oxygen	8.6
pH	7.70
Turbidity	1.16
WQ Instrument Used	YSI 556
Water Odors	☑ Normal / None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		8.0
Boulder	**>256 mm** (10")	5.0
Cobble	**64 - 256 mm** (2.5" - 10")	15.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	40.0
Sand	**0.06 - 2 mm** (gritty)	2.0
Silt	**0.004 - 0.06 mm**	20.0
Clay	(slick)	10.0

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	15
Embeddedness	4
Velocity / Depth Regime	13
Sediment Deposition	9
Channel Flow Status	13

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	12
Frequency of Riffles (or Bends)	7
Bank Stability (LEFT BANK)	7
Bank Stability (RIGHT BANK)	3
Vegetative Protection (LEFT BANK)	7
Vegetative Protection (RIGHT BANK)	4
Riparian Vegetative Zone Width (LEFT BANK)	7
Riparian Vegetative Zone Width (RIGHT BANK)	9

Field Photography

Image 1

Caption for Image 1

Downstream extent, marker on right

Image 2

Caption for Image 2

D/s from top of reach

Image 3

Caption for Image 3

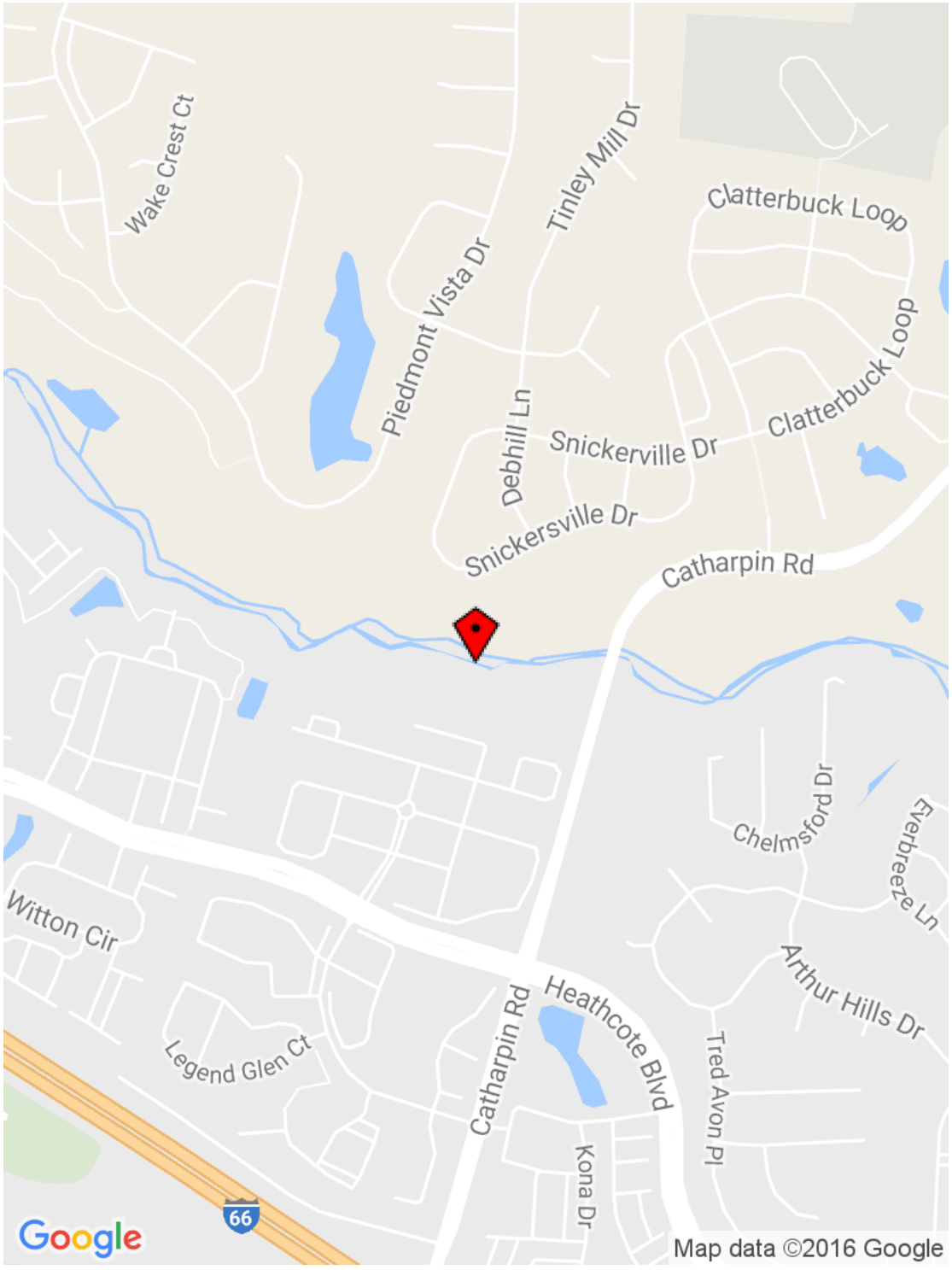
U/s from top of reach

Signature


Signature Date/Time
10/06/2016 12:29:17 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map

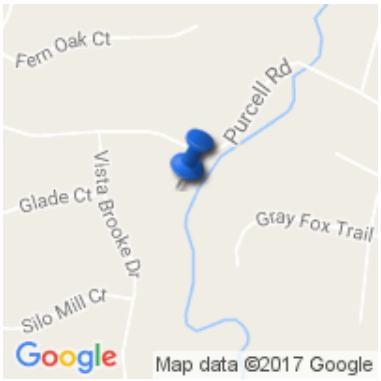


amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Purcell Branch
Location	Purcell Road, BMP
River Basin	
Investigators	Ben Green and Zachary Blanchet
Date	04/20/2017
Time	05:13 PM GMT-04:00
Reason for Survey	Biomonitoring
Weather Conditions	% Cloud Cover

GPS location



RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	5.3
Est. Stream Depth (m)	0.11
Surface Velocity (m/sec at thalweg)	0.19
Canopy Cover	Shaded
High Water Mark (m)	0.46
Channelized	(●) Yes ( ) No
Dam Present	( ) Yes (●) No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	70
Run (%)	20
Pool (%)	10

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	85

WATER QUALITY

Temperature	20.07
Specific Conductance	0.383
Dissolved Oxygen	9.65
pH	8.03
Turbidity	1.07
WQ Instrument Used	YSI
Water Odors	[✓] Normal / None [ ] Sewage [ ] Petroleum [ ] Chemical [ ] Fishy [ ] Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		15.0
Boulder	**>256 mm** (10")	15.0
Cobble	**64 - 256 mm** (2.5" - 10")	25.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	15.0
Sand	**0.06 - 2 mm** (gritty)	30.0
Silt	**0.004 - 0.06 mm**	0.0
Clay	(slick)	0.0

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	13
Embeddedness	9
Velocity / Depth Regime	13
Sediment Deposition	10
Channel Flow Status	9

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	10
Frequency of Riffles (or Bends)	14
Bank Stability (LEFT BANK)	3
Bank Stability (RIGHT BANK)	5
Vegetative Protection (LEFT BANK)	4
Vegetative Protection (RIGHT BANK)	5
Riparian Vegetative Zone Width (LEFT BANK)	8
Riparian Vegetative Zone Width (RIGHT BANK)	5

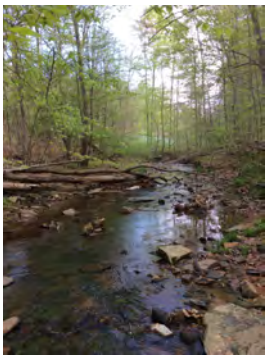
Field Photography

Image 1

Caption for Image 1

Upstream from WQ point.

Image 2



Caption for Image 2

Downstream from WQ point. Development along Purcell add viewable in distance.

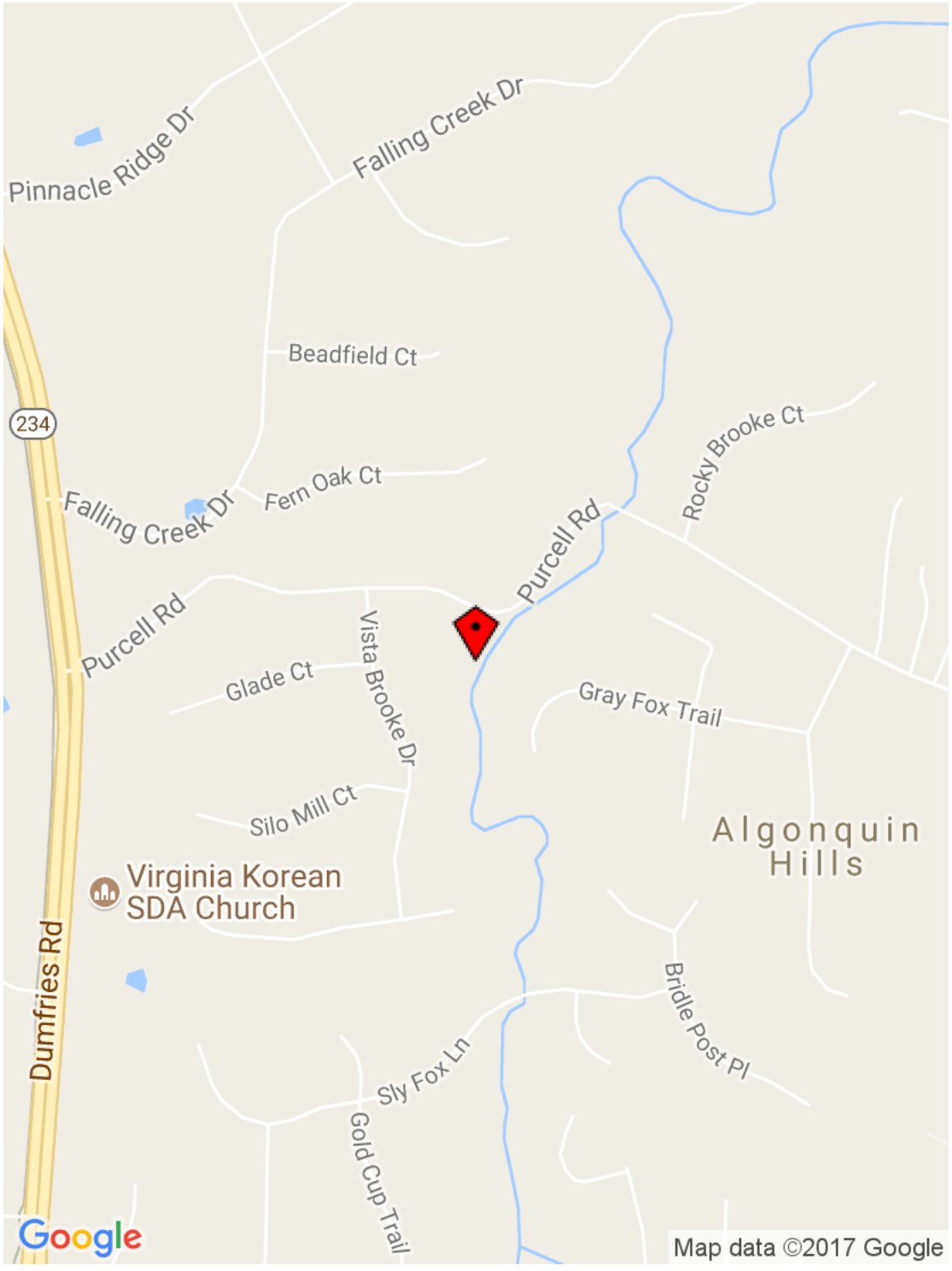
Image 3

Caption for Image 3

More prevalent veg at sampling point.

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map

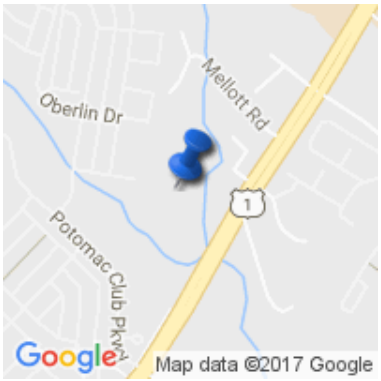


amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Cow Branch
Location	Dale City
River Basin	
Investigators	Ben Green and John Miller
Date	04/19/2017
Time	11:59 AM GMT-04:00
Reason for Survey	Biological Monitoring
Weather Conditions	Showers (intermittent)

GPS location



RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	3.0
Est. Stream Depth (m)	0.13
Surface Velocity (m/sec at thalweg)	0.12
Canopy Cover	Partly shaded
High Water Mark (m)	1.07
Channelized	(•) Yes ( ) No
Dam Present	( ) Yes (•) No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	30
Run (%)	60
Pool (%)	10

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	75

WATER QUALITY

Temperature	14.78
Specific Conductance	0.781
Dissolved Oxygen	10.62
pH	6.68
Turbidity	1.83
WQ Instrument Used	YSI 556, HACH2100Q
Water Odors	☑ Normal / None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		0.0
Boulder	**>256 mm** (10")	5.0
Cobble	**64 - 256 mm** (2.5" - 10")	30.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	20.0
Sand	**0.06 - 2 mm** (gritty)	35.0
Silt	**0.004 - 0.06 mm**	10.0
Clay	(slick)	0.0

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	8
Embeddedness	7
Velocity / Depth Regime	10
Sediment Deposition	7
Channel Flow Status	9

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	6
Frequency of Riffles (or Bends)	14
Bank Stability (LEFT BANK)	7
Bank Stability (RIGHT BANK)	8
Vegetative Protection (LEFT BANK)	6
Vegetative Protection (RIGHT BANK)	2
Riparian Vegetative Zone Width (LEFT BANK)	5
Riparian Vegetative Zone Width (RIGHT BANK)	9

Field Photography

Image 1

Caption for Image 1

Upstream

Image 2

Image 3

Caption for Image 3

Large bar

Image 4

Caption for Image 4
Pipeline land disturbance left bank.

Image 5

Caption for Image 5
Start of sampling reach

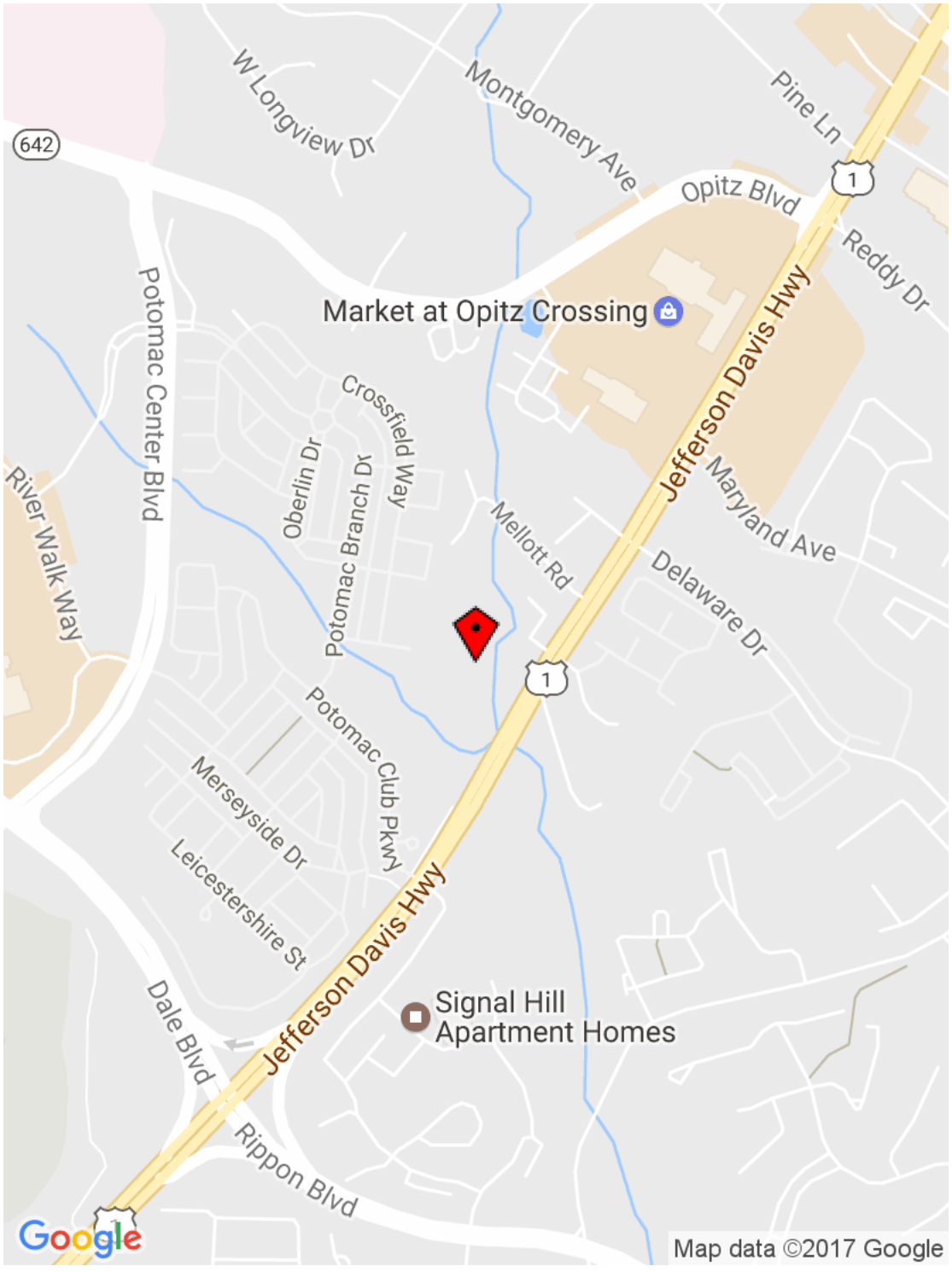
Report completed by:
John Miller

Signature


Signature Date/Time
04/19/2017 12:00 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map



amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Dawkins
Location	
River Basin	
Investigators	Ben Green and Zachary Blanchet
Date	04/20/2017
Time	05:44 PM GMT-04:00
Reason for Survey	
Weather Conditions	Clear / Sunny

GPS location

RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	3.505
Est. Stream Depth (m)	0.076
Surface Velocity (m/sec at thalweg)	0.3
Canopy Cover	Partly shaded
High Water Mark (m)	0.38
Channelized	(•) Yes ( ) No
Dam Present	( ) Yes (•) No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	30
Run (%)	65
Pool (%)	5

AQUATIC VEGETATION

Dominant Type	Rooted emergent
Portion of reach with aquatic veg	45

WATER QUALITY

Temperature	23.63
Specific Conductance	1.031
Dissolved Oxygen	9.03
pH	8.44
Turbidity	3.39
WQ Instrument Used	YSI 556
Water Odors	[x] Normal / None [ ] Sewage [ ] Petroleum [ ] Chemical [ ] Fishy [ ] Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		0.0
Boulder	**>256 mm** (10")	5.0
Cobble	**64 - 256 mm** (2.5" - 10")	15.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	35.0
Sand	**0.06 - 2 mm** (gritty)	30.0
Silt	**0.004 - 0.06 mm**	15.0
Clay	(slick)	0.0

Parameters to be evaluated in sampling reach

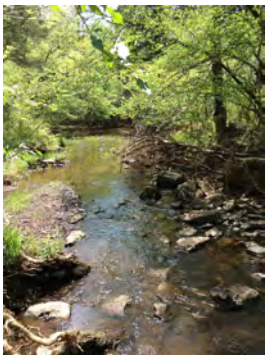
Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	14
Embeddedness	6
Velocity / Depth Regime	11
Sediment Deposition	12
Channel Flow Status	12

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	16
Frequency of Riffles (or Bends)	16
Bank Stability (LEFT BANK)	6
Bank Stability (RIGHT BANK)	7
Vegetative Protection (LEFT BANK)	8
Vegetative Protection (RIGHT BANK)	8
Riparian Vegetative Zone Width (LEFT BANK)	9
Riparian Vegetative Zone Width (RIGHT BANK)	9

Field Photography

Image 1



Caption for Image 1

Downstream from WQ point. Backwater forming.

Image 2

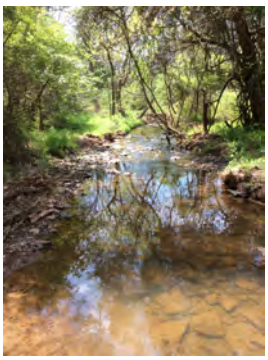
Caption for Image 2

Upstream from WQ point.

Image 3

Caption for Image 3

Upstream from WQ point, beaver dam in background.

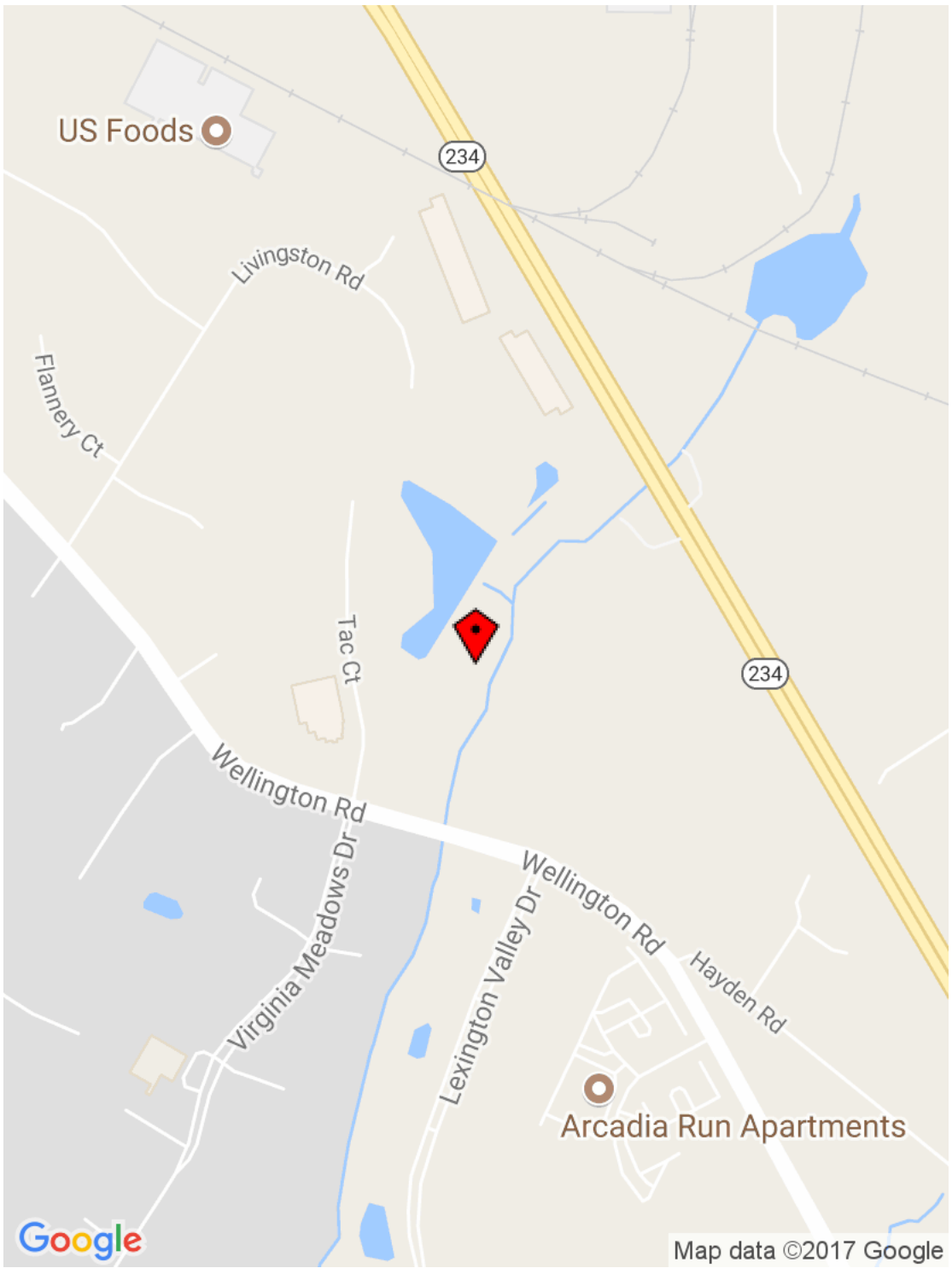
Image 4

Caption for Image 4
Downstream from WQ point.

Signature


Signature Date/Time
04/20/2017 05:50 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map

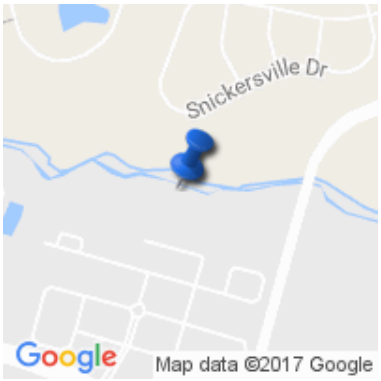


amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Little Bull Run
Location	Catharine
River Basin	
Investigators	Ben Green and John Miller
Date	04/21/2017
Time	09:54 AM GMT-04:00
Reason for Survey	
Weather Conditions	Clear / Sunny

GPS location



RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	6.1
Est. Stream Depth (m)	0.18
Surface Velocity (m/sec at thalweg)	0.34
Canopy Cover	Partly shaded
High Water Mark (m)	0.81
Channelized	○ Yes ◉ No
Dam Present	○ Yes ◉ No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	40
Run (%)	30
Pool (%)	30

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	40

WATER QUALITY

Temperature	18.27
Specific Conductance	0.942
Dissolved Oxygen	8.1
pH	7.65
Turbidity	
WQ Instrument Used	YSI556
Water Odors	☐ Normal / None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☑ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☐ None ☑ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		10.0
Boulder	**>256 mm** (10")	0.0
Cobble	**64 - 256 mm** (2.5" - 10")	20.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	25.0
Sand	**0.06 - 2 mm** (gritty)	10.0
Silt	**0.004 - 0.06 mm**	25.0
Clay	(slick)	10.0

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	12
Embeddedness	7
Velocity / Depth Regime	9
Sediment Deposition	8
Channel Flow Status	10

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	7
Frequency of Riffles (or Bends)	4
Bank Stability (LEFT BANK)	4
Bank Stability (RIGHT BANK)	3
Vegetative Protection (LEFT BANK)	7
Vegetative Protection (RIGHT BANK)	5
Riparian Vegetative Zone Width (LEFT BANK)	8
Riparian Vegetative Zone Width (RIGHT BANK)	10

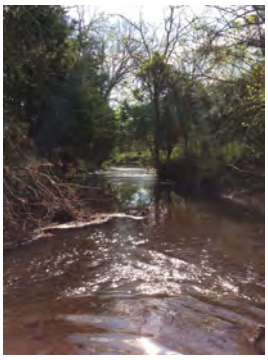
Field Photography

Image 1

Caption for Image 1

Looking towards upstream extent

Image 2



Caption for Image 2

Looking toward downstream extent

Image 3

Caption for Image 3

Start of sampling reach

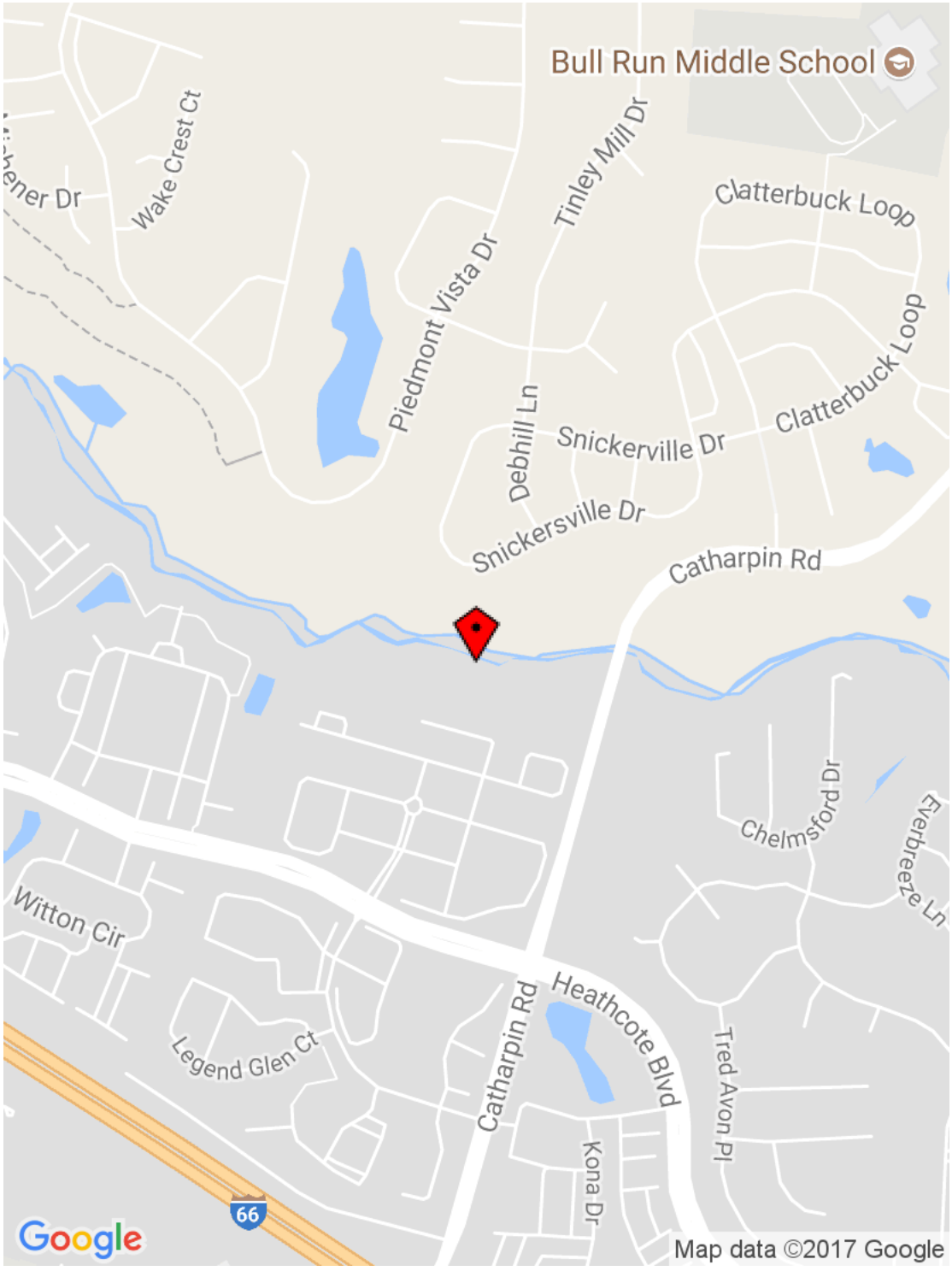
Report completed by:
John Miller

Signature


Signature Date/Time
04/21/2017 11:00 AM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map



amec foster wheeler

Prince William Biological Monitoring Form

Stream Name	Neabsco
Location	
River Basin	
Investigators	Ben Green and John Miller
Date	04/19/2017
Time	05:12 PM GMT-04:00
Reason for Survey	PWC Biomonitoring
Weather Conditions	Showers (intermittent)

RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Shrubs

INSTREAM FEATURES

Est. Stream Width (m)	6.22
Est. Stream Depth (m)	0.23
Surface Velocity (m/sec at thalweg)	0.35
Canopy Cover	Partly shaded
High Water Mark (m)	0.69
Channelized	○ Yes ◉ No
Dam Present	○ Yes ◉ No
Proporation of Reach by Stream Morphology Types	
Riffle (%)	45
Run (%)	35
Pool (%)	20

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	35

WATER QUALITY

Temperature	15.89
Specific Conductance	0.205
Dissolved Oxygen	10.69
pH	8.05
Turbidity	1.78
WQ Instrument Used	YSI 556
Water Odors	☑ Normal / None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other

Water Surface Oils	
	☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☑ None ☐ Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		15.0
Boulder	**>256 mm** (10")	25.0
Cobble	**64 - 256 mm** (2.5" - 10")	35.0
Gravel	**2 - 64 mm** (0.1" - 2.5")	15.0
Sand	**0.06 - 2 mm** (gritty)	10.0
Silt	**0.004 - 0.06 mm**	0.0
Clay	(slick)	0.0

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	12
Embeddedness	12
Velocity / Depth Regime	14
Sediment Deposition	13
Channel Flow Status	10

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	13
Frequency of Riffles (or Bends)	17
Bank Stability (LEFT BANK)	3
Bank Stability (RIGHT BANK)	5
Vegetative Protection (LEFT BANK)	4
Vegetative Protection (RIGHT BANK)	4
Riparian Vegetative Zone Width (LEFT BANK)	7
Riparian Vegetative Zone Width (RIGHT BANK)	9

Field Photography

Image 1

Caption for Image 1

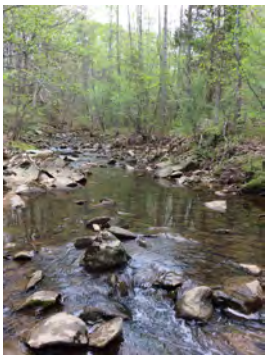
Upstream end towards steak.

Image 2

Caption for Image 2

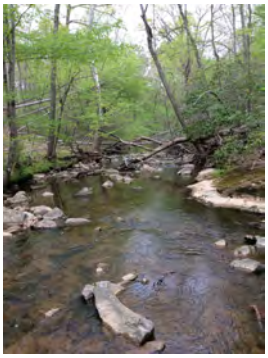
Downstream end of reach. White bucket marks end of sampling reach.

Image 3



Caption for Image 3

Upstream from WQ sample point.

Image 4

Caption for Image 4
Beaver activity downstream, may impact future sampling efforts.

Report completed by:
Ben Green

Signature


Signature Date/Time
04/19/2017 04:20 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

APPENDIX B

WATER QUALITY LABORATORY RESULTS

Occoquan Watershed Monitoring Laboratory
9408 Prince William St.
Manassas, VA 20110
Tel: (703) 361-5606

Virginia Laboratory ID: 460026
26-Oct-16

Att: Mr. Benjamin Green
Amec Foster Wheeler Environment & Infrastructure, Inc.
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Analysis Report

Report #20161016

Description	Sample Date	Sample ID	Result	Unit	Reporting Limit	Method	Analysis Date
Ammonia as N	10/4/2016	16-2713 PC20	0.04	mg/L	0.01	SM4500-NH3 G	10/24/2016
E. coli	10/4/2016	16-2713 PC20	249.00	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	10/4/2016
Nitrate+nitrite as N	10/4/2016	16-2713 PC20	0.34	mg/L	0.01	SM4500-NO3-F	10/24/2016
Orthophosphate as P	10/4/2016	16-2713 PC20	<0.01	mg/L	0.01	SM4500-P F	10/24/2016
Total Kjeldahl Nitrogen	10/4/2016	16-2713 PC20	<0.50	mg/L	0.50	Lachat 10-107-06-2D	10/24/2016
Total Phosphorus	10/4/2016	16-2713 PC20	0.02	mg/L	0.01	SM4500-P F, 4500-P J	10/24/2016
Total Suspended Solids	10/4/2016	16-2713 PC20	<1.0	mg/L	1.0	SM2540D	10/12/2016
Ammonia as N	10/4/2016	16-2714 PC80	0.02	mg/L	0.01	SM4500-NH3 G	10/24/2016
E. coli	10/4/2016	16-2714 PC80	179.00	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	10/4/2016
Nitrate+nitrite as N	10/4/2016	16-2714 PC80	0.30	mg/L	0.01	SM4500-NO3-F	10/24/2016
Orthophosphate as P	10/4/2016	16-2714 PC80	0.01	mg/L	0.01	SM4500-P F	10/24/2016
Total Kjeldahl Nitrogen	10/4/2016	16-2714 PC80	0.50	mg/L	0.50	Lachat 10-107-06-2D	10/24/2016
Total Phosphorus	10/4/2016	16-2714 PC80	0.01	mg/L	0.01	SM4500-P F, 4500-P J	10/24/2016
Total Suspended Solids	10/4/2016	16-2714 PC80	<1.0	mg/L	1.0	SM2540D	10/12/2016
Ammonia as N	10/5/2016	16-2727 PC10	0.01	mg/L	0.01	SM4500-NH3 G	10/24/2016
E. coli	10/5/2016	16-2727 PC10	727.00	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	10/5/2016
Nitrate+nitrite as N	10/5/2016	16-2727 PC10	0.51	mg/L	0.01	SM4500-NO3-F	10/24/2016
Orthophosphate as P	10/5/2016	16-2727 PC10	<0.01	mg/L	0.01	SM4500-P F	10/24/2016
Total Kjeldahl Nitrogen	10/5/2016	16-2727 PC10	<0.5	mg/L	0.50	Lachat 10-107-06-2D	10/24/2016
Total Phosphorus	10/5/2016	16-2727 PC10	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	10/24/2016
Total Suspended Solids	10/5/2016	16-2727 PC10	<1.0	mg/L	1.0	SM2540D	10/12/2016
Ammonia as N	10/5/2016	16-2728 PC60	0.08	mg/L	0.01	SM4500-NH3 G	10/24/2016
E. coli	10/5/2016	16-2728 PC60	1144.00	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	10/5/2016
Nitrate+nitrite as N	10/5/2016	16-2728 PC60	1.18	mg/L	0.01	SM4500-NO3-F	10/24/2016
Orthophosphate as P	10/5/2016	16-2728 PC60	0.02	mg/L	0.01	SM4500-P F	10/24/2016
Total Kjeldahl Nitrogen	10/5/2016	16-2728 PC60	0.77	mg/L	0.50	Lachat 10-107-06-2D	10/24/2016
Total Phosphorus	10/5/2016	16-2728 PC60	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	10/24/2016
Total Suspended Solids	10/5/2016	16-2728 PC60	3.7	mg/L	1.0	SM2540D	10/12/2016
Ammonia as N	10/6/2016	16-2729 PC90	0.03	mg/L	0.01	SM4500-NH3 G	10/24/2016
E. coli	10/6/2016	16-2729 PC90	98.80	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	10/6/2016
Nitrate+nitrite as N	10/6/2016	16-2729 PC90	1.73	mg/L	0.01	SM4500-NO3-F	10/24/2016
Orthophosphate as P	10/6/2016	16-2729 PC90	0.02	mg/L	0.01	SM4500-P F	10/24/2016
Total Kjeldahl Nitrogen	10/6/2016	16-2729 PC90	<0.5	mg/L	0.50	Lachat 10-107-06-2D	10/24/2016
Total Phosphorus	10/6/2016	16-2729 PC90	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	10/24/2016
Total Suspended Solids	10/6/2016	16-2729 PC90	1.2	mg/L	1.0	SM2540D	10/12/2016
Ammonia as N	10/6/2016	16-2729d PC90	0.02	mg/L	0.01	SM4500-NH3 G	10/24/2016
E. coli	10/6/2016	16-2729d PC90	111.00	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	10/6/2016
Nitrate+nitrite as N	10/6/2016	16-2729d PC90	1.77	mg/L	0.01	SM4500-NO3-F	10/24/2016
Orthophosphate as P	10/6/2016	16-2729d PC90	0.02	mg/L	0.01	SM4500-P F	10/24/2016
Total Kjeldahl Nitrogen	10/6/2016	16-2729d PC90	<0.5	mg/L	0.50	Lachat 10-107-06-2D	10/24/2016
Total Phosphorus	10/6/2016	16-2729d PC90	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	10/24/2016

Total Suspended Solids	10/6/2016	16-2729d PC90	1.2	mg/L	1.0	SM2540D	10/12/2016

n.a.= not applicable

Note: TKN samples were contracted to NELAC certified lab at Prince William County Service Authority

Prepared by:

Dongmei Wang

Laboratory Supervisor

Occoquan Watershed Monitoring Laboratory
9408 Prince William St.
Manassas, VA 20110
Tel: (703) 361-5606

Virginia Laboratory ID: 460026
26-Oct-16

Att: Mr. Benjamin Green
Amec Foster Wheeler Environment & Infrastructure, Inc.
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Analysis Report

Report #20161026

Description	Blank	LCS, %R	Duplicate, RPD	Spike, %R	Matrix Spike, %R	Method	Analysis Date
Ammonia as N	0.005	107	n.a.	104	107	SM4500-NH3 G	10/24/2016
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
E. coli	n.a.	n.a.	0	n.a.	n.a.	SM9221 B(LT)E(EC)C MPN	10/4/2016
Accepted Range			n.a.				
Nitrate+nitrite as N	0.005	96	n.a.	103	104	SM4500-NO3-F	10/24/2016
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
Orthophosphate as P	0.006	99	n.a.	93	91	SM4500-P F	10/24/2016
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
Total Kjeldahl Nitrogen	-0.09	97.50	5.33	94.20	98.80	Lachat 10-107-06-2D	10/24/2016
Accepted Range		100±10	±20	100±10	100±10		
Total Phosphorus	-0.004	99	0	104	n.a.	SM4500-P F, 4500-P J	10/24/2016
Accepted Range	-0.01~0.01	100±10	±10	100±10	100±10		
Total Suspended Solids	-0.10	n.a.	5	n.a.	n.a.	SM2540D	10/12/2016
Accepted Range	-1.0~1.0		±20				

Note: TKN samples were contracted to NELAC certified lab at Prince William County Service Authority

Prepared by:

Dongmei Wang

Laboratory Supervisor

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9408 Prince William St.
Manassas, VA 20110
Tel: (703) 361-5606

Virginia Laboratory ID: 460026

Att: Mr. Benjamin Green
Amec Foster Wheeler Environment & Infrastructure, Inc.
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Analysis Report

Report #20160810

Description	Sample Date	Sample ID	Result	Unit	Reporting Limit	Method	Analysis Date
Ammonia as N	4/19/2017	17-0675 PC20	0.02	mg/L	0.01	SM4500-NH3 G	5/5/2017
E. coli	4/19/2017	17-0675 PC20	22.8	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/20/2017
Nitrate+nitrite as N	4/19/2017	17-0675 PC20	0.17	mg/L	0.01	SM4500-NO3-F	5/5/2017
Orthophosphate as P	4/19/2017	17-0675 PC20	<0.01	mg/L	0.01	SM4500-P F	5/5/2017
Total Kjeldahl Nitrogen	4/19/2017	17-0675 PC20	<0.50	mg/L	0.50	Lachat 10-107-06-2D	4/27/2017
Total Phosphorus	4/19/2017	17-0675 PC20	0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/15/2017
Total Suspended Solids	4/19/2017	17-0675 PC20	1.2	mg/L	1.0	SM2540D	4/27/2017
Ammonia as N	4/19/2017	17-0676 PC60	<0.01	mg/L	0.01	SM4500-NH3 G	5/5/2017
E. coli	4/19/2017	17-0676 PC60	12.1	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/20/2017
Nitrate+nitrite as N	4/19/2017	17-0676 PC60	0.01	mg/L	0.01	SM4500-NO3-F	5/5/2017
Orthophosphate as P	4/19/2017	17-0676 PC60	<0.01	mg/L	0.01	SM4500-P F	5/5/2017
Total Kjeldahl Nitrogen	4/19/2017	17-0676 PC60	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/27/2017
Total Phosphorus	4/19/2017	17-0676 PC60	0.02	mg/L	0.01	SM4500-P F, 4500-P J	5/15/2017
Total Suspended Solids	4/19/2017	17-0676 PC60	1.1	mg/L	1.0	SM2540D	4/27/2017
Ammonia as N	4/20/2017	17-0677 PC10	0.01	mg/L	0.01	SM4500-NH3 G	5/5/2017
E. coli	4/20/2017	17-0677 PC10	13.2	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/21/2017
Nitrate+nitrite as N	4/20/2017	17-0677 PC10	0.27	mg/L	0.01	SM4500-NO3-F	5/5/2017
Orthophosphate as P	4/20/2017	17-0677 PC10	<0.01	mg/L	0.01	SM4500-P F	5/5/2017
Total Kjeldahl Nitrogen	4/20/2017	17-0677 PC10	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/27/2017
Total Phosphorus	4/20/2017	17-0677 PC10	0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/15/2017
Total Suspended Solids	4/20/2017	17-0677 PC10	<1.0	mg/L	1.0	SM2540D	4/27/2017
Ammonia as N	4/20/2017	17-0680 PC80	0.04	mg/L	0.01	SM4500-NH3 G	5/5/2017
E. coli	4/20/2017	17-0680 PC80	14.6	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/21/2017
Nitrate+nitrite as N	4/20/2017	17-0680 PC80	0.35	mg/L	0.01	SM4500-NO3-F	5/5/2017
Orthophosphate as P	4/20/2017	17-0680 PC80	<0.01	mg/L	0.01	SM4500-P F	5/5/2017
Total Kjeldahl Nitrogen	4/20/2017	17-0680 PC80	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/27/2017
Total Phosphorus	4/20/2017	17-0680 PC80	0.05	mg/L	0.01	SM4500-P F, 4500-P J	5/15/2017
Total Suspended Solids	4/20/2017	17-0680 PC80	4.6	mg/L	1.0	SM2540D	4/27/2017
Ammonia as N	4/21/2017	17-0766 PC90	0.03	mg/L	0.01	SM4500-NH3 G	5/5/2017
E. coli	4/21/2017	17-0766 PC90	130	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/22/2017
Nitrate+nitrite as N	4/21/2017	17-0766 PC90	0.33	mg/L	0.01	SM4500-NO3-F	5/5/2017
Orthophosphate as P	4/21/2017	17-0766 PC90	<0.01	mg/L	0.01	SM4500-P F	5/5/2017
Total Kjeldahl Nitrogen	4/21/2017	17-0766 PC90	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/27/2017
Total Phosphorus	4/21/2017	17-0766 PC90	0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/15/2017
Total Suspended Solids	4/21/2017	17-0766 PC90	1.2	mg/L	1.0	SM2540D	4/27/2017

Note: TKN samples were contracted to NELAC certified lab at Prince William County Service Authority

Prepared by:

Dongmei Alvi (Wang) 5/17/2017

Laboratory Supervisor

Occoquan Watershed Monitoring Laboratory
9408 Prince William St.
Manassas, VA 20110
Tel: (703) 361-5606

Virginia Laboratory ID: 460026

Att: Mr. Benjamin Green
Amec Foster Wheeler Environment & Infrastructure, Inc.
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Analysis Report

Report #20160810

Description	Blank	LCS, %R	Duplicate, RPD	Spike, %R	Matrix Spike, %R	Method	Analysis Date
Ammonia as N	0.005	107	n.a.	104	107	SM4500-NH3 G	5/5/2017
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
E. coli	n.a.	n.a.	n.a.	n.a.	n.a.	SM9221 B(LT)E(EC)C MPN	
Accepted Range							
Nitrate+nitrite as N	0.005	96	n.a.	103	104	SM4500-NO3-F	5/5/2017
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
Orthophosphate as P	0.006	99	n.a.	93	91	SM4500-P F	5/5/2017
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
Total Kjeldahl Nitrogen	n.a.	n.a.	n.a.	n.a.	n.a.	Lachat 10-107-06-2D	4/27/2017
Accepted Range							
Total Phosphorus	-0.004	99	0	104	n.a.	SM4500-P F, 4500-P J	5/15/2017
Accepted Range	-0.01~0.01	100±10	±10	100±10	100±10		
Total Suspended Solids	-0.10	n.a.	3	n.a.	n.a.	SM2540D	4/27/2017
Accepted Range	-1.0~1.0		±20				

n.a.= not applicable

Note: TKN samples were contracted to NELAC certified lab at Prince William County Service Authority

Prepared by:

Dongmei Alvi (Wang) 5/17/2017

Laboratory Supervisor

APPENDIX C

BENTHIC MACROINVERTEBRATE LABORATORY RESULTS

December 2, 2016

Mr. Ben Green
Amec Foster Wheeler
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Subject: **Prince William County Multiple Habitat Sampling Method Report**
Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, Purcell Branch
Amec Foster Wheeler Project No.: 151270003

Dear Mr. Green:

Amec Foster Wheeler (Gainesville office), Environment & Infrastructure, Inc. (Amec Foster Wheeler) completed benthic macroinvertebrate determinations for samples collected by Amec Foster Wheeler (Chantilly office), in October 2016. Amec Foster Wheeler received a total of six samples, one from each of the following locations: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch, and a duplicate samples from Little Bull Run. The results of the taxonomic analyses are presented in this report.

Multiple Habitat Sampling Method

Methods and Procedures

All samples collected by Amec Foster Wheeler, Chantilly office, in October 2016, were received by Amec Foster Wheeler taxonomy laboratory at Gainesville, Florida, where they were logged in and processed. The samples were sorted (i.e. organisms removed from debris) and organisms were identified and enumerated by a qualified taxonomist according to Section 7.2 of the U.S. Environmental Protection Agency's (USEPA) *"Rapid Bioassessment Protocol for Use in Wadeable Streams and Rivers"* (RBP) (Barbour *et al.*, 1999). Eight metrics were calculated including the Biotic Index, using guidance from Hilsenhoff (1987); the Percent Model Affinity (PMA), using guidance from Novak and Bode (1992); and the Virginia Stream Condition Index, using guidance from Virginia Department of Environmental Quality (2008). The scraper taxa and tolerance values were identified according to life history information from RBP (Barbour *et al.*, 1999); "*An Introduction to the Aquatic Insects of North America"* (Merritt *et al.*, 2008); *"Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys*" (Tennessee Department of Environment and Conservation, 2011); and *"Standard Operating Procedures for the Collection and Analysis of Benthic Macroinvertebrates"* (North Carolina Department of Environmental Quality, 2016). Quality assurance and quality control checks were conducted according to the EPA RBP on Laboratory Quality Control for Macroinvertebrate Taxonomic Identification (Barbour *et al.*, 1999). Quality assurance/quality control requirements for sample picking and taxonomic identification were conducted by an Amec Foster Wheeler senior taxonomist.

Benthic Macroinvertebrate Results

The benthic invertebrate community data were used to generate metrics outlined in the Amec Foster Wheeler draft sampling plan. The Multiple Habitat Sampling assessments conducted at the five locations are summarized below in **Table 1**.

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404 SW 140th Terrace
Newberry, Florida
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Table 1. Summary of Results of Multiple Habitat Samples

Metrics	Site Locations					
	COW-PC20	DK-PC30	LB-PC90	LB-PC90 (Duplicate)	NB-PC60	PB-PC10
Taxa Richness	11	16	25	24	15	26
Abundance	168	220	206	225	165	205
EPT Index	3	4	5	4	4	5
EPT/EPT + Chironomidae Ratio	0.21	0.33	0.71	0.50	0.31	0.14
Percent Dominant Taxon	39.29	39.09	17.96	32.44	55.76	25.37
Percent Chironomidae	6.55	3.64	0.97	1.78	5.45	15.61
Biotic Index (BI)	5.42	6.06	5.91	5.39	6.01	5.67
Biotic Index (BI) Category	Good	Fair	Fair	Good	Fair	Fair
Percent Model Affinity (PMA)	57.74	41.82	37.38	35.11	62.42	63.78
Percent Model Affinity (PMA) Category	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted	Slightly Impacted	Slightly Impacted
VSCI	36.54	49.42	56.59	59.59	39.44	57.34

Source: Amec Foster Wheeler, 2016 Prepared by: RJM Checked by: NP

Taxonomic identifications and abundances of the benthic invertebrates and metric calculations for each sample are included in Attachment 1. References are listed in Attachment 2.

Closing

We appreciate the opportunity to provide ecological services to you. Please do not hesitate to contact me if you have questions, or need to request further information. You can reach me by phone at (352) 333-3634, or via email at shannon.mcmorrow@amecfw.com.

Sincerely,
Amec Foster Wheeler Environment & Infrastructure, Inc.

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Attachments:
Attachment 1: Tabulated Data
Attachment 2: References

Attachment 1
Tabulated Data

Multiple Habitat Sampling
Samples Collected 10/2016
Project #: 151270003

Metrics	Site Locations					
	COW-PC20	DK-PC30	LB-PC90	LB-PC90 (Duplicate)	NB-PC60	PB-PC10
Taxa Richness	11	16	25	24	15	26
Abundance	168	220	206	225	165	205
EPT Index	3	4	5	4	4	5
EPT/EPT + Chironomidae Ratio	0.21	0.33	0.71	0.50	0.31	0.14
Percent Dominant Taxon	39.29	39.09	17.96	32.44	55.76	25.37
Percent Chironomidae	6.55	3.64	0.97	1.78	5.45	15.61
Biotic Index (BI)	5.54	6.13	5.95	5.40	6.00	5.70
Biotic Index (BI) Category	Good	Fair	Fair	Good	Fair	Fair
Percent Model Affinity (PMA)	57.74	41.82	37.38	35.11	62.42	63.78
Percent Model Affinity (PMA) Category	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted	Slightly Impacted	Slightly Impacted
VSCI	36.32	49.27	56.51	59.57	39.45	57.30

Cow Branch - PC20
Multiple Habitat Sampling
Samples Collected 10/04/2016
Project #: 151270003

Results for COW-PC20

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	*Nais pardalis*	8						8.7	0.41		8				
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Baetis spp.*	40	1					4.51	1.07						40
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche spp.*	66			1		66	6.6	2.59						66
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Hydropsyche spp.*	39			1			4	0.93						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	2				2		6	0.07						
Arthropoda	Insecta	Diptera	Chironomidae	*Tanytarsus spp.*	4				4		6.6	0.16						
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum illinoense group*	1				1		8.7	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum aviceps*	2				2		3.6	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	*Ablabesmyia mallochi*	1				1		7.4	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus or Orthocladius*	1				1		4.1	0.02						
Arthropoda	Insecta	Diptera	Empididae	*Hemerodromia spp.*	4						6	0.14			4			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	39.40
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.81
Model % Chironomidae	20	13.45
Model % Coleoptera	10	10.00
Model % Oligochaeta	5	0.24
Model % Other	10	7.62
Sum of Difference		84.52
Sum of Difference * 0.5		42.26
Percent Model Affinity 100 - (Sum of Difference * 0.5)		57.74
Percent Model Affinity Category		Slightly Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	11	50.00	50.00
Total Abundance	168		
% Ephemeroptera	0.60	0.97	0.97
% Plecoptera	0.00		
% Trichoptera	1.19		
% Chironomidae	6.55	93.45	93.45
% Dominant Taxon	39.29		
Biotic Index	5.54	65.53	65.53
% Coleoptera	0.00		
% Oligochaeta	4.76		
% Other	2.38		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.00	0.00	0.00
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	63.10	53.33	53.33
EPT Index	3	27.27	27.27
EPT/EPT + Chironomidae Ratio	0.21		

Hilsenhoff Biotic Index Category	Good

Final VSCI score	36.32

Dawkins Branch - PC30
Multiple Habitat Sampling
Samples Collected 10/05/2016
Project #: 151270003

Results for DK-PC30

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Platyhelminthes				Platyhelminthes spp.	2							0.00			2			
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula fluminea*	35						6.6	1.05			35			
Arthropoda	Insecta	Ephemeroptera	Caenidae	*Caenis spp.*	5	1					6.8	0.15						
Arthropoda	Insecta	Odonata	Coenagrionidae	*Argia spp.*	7						8.3	0.26			7			
Arthropoda	Insecta	Odonata	Libellulidae	Libellulidae spp.	1						9	0.04			1			
Arthropoda	Insecta	Trichoptera	Polycentropodidae	*Cyrnellus fraternus*	1			1			6.8	0.03				1		
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche spp.*	53			1			6.6	1.59						53
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Hydropsyche spp.*	5			1			4	0.09						
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia spp.*	12						5.5	0.30						
Arthropoda	Insecta	Coleoptera	Elmidae	*Stenelmis spp.*	86					86	5.6	2.19	86				86	86
Arthropoda	Insecta	Coleoptera	Psephenidae	*Psephenus spp.*	1						2.35	0.01	1				1	
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum illinoense group*	7				7		8.7	0.28						
Arthropoda	Insecta	Diptera	Chironomidae	*Rheotanytarsus spp.*	1				1		6.5	0.03						
Arthropoda	Insecta	Diptera	Ceratopogonidae	*Atrichopogon spp.*	1						6.1	0.03			1			
Arthropoda	Insecta	Diptera	Tipulidae	Tipulidae spp.	1						4.9	0.02			1			
Arthropoda	Insecta	Diptera	Empididae	*Hemerodromia spp.*	2						6	0.05			2			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	39.55
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.64
Model % Chironomidae	20	16.36
Model % Coleoptera	10	29.55
Model % Oligochaeta	5	5.00
Model % Other	10	12.27

Sum of Difference	116.36
Sum of Difference * 0.5	58.18
Percent Model Affinity 100 - (Sum of Difference * 0.5)	41.82
Percent Model Affinity Category	Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	16	72.73	72.73
Total Abundance	220		
% Ephemeroptera	0.45	0.74	0.74
% Plecoptera	0.00		
% Trichoptera	1.36		
% Chironomidae	3.64	96.36	96.36
% Dominant Taxon	39.09		
Biotic Index	6.13	56.88	56.88
% Coleoptera	39.55		
% Oligochaeta	0.00		
% Other	22.27		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.45	1.28	1.28
% Scrapers	39.55	76.64	76.64
% Top 2 Dominant Taxa	63.18	53.21	53.21
EPT Index	4	36.36	36.36
EPT/EPT + Chironomidae Ratio	0.33		

Hilsenhoff Biotic Index Category	Fair

Final VSCI score	49.27

Little Bull Run - PC90
Multiple Habitat Sampling
Samples Collected 10/06/2016
Project #: 151270003

Results for LB-PC90

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	12						6.1	0.36		12				
Mollusca	Gastropoda	Hygrophila	Physidae	*Physella spp.*	9						8.84	0.39			9			
Mollusca	Gastropoda	Hygrophila	Planorbidae	*Planorbella spp.*	13						6	0.38			13			
Mollusca	Gastropoda	Littorinimorpha	Hydrobiidae	Hydrobiidae spp.	3						5.78	0.08			3			
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula fluminea*	12						6.6	0.38			12			
Arthropoda	Malacostraca	Decapoda	Cambaridae	Cambaridae spp.	1						7.5	0.04			1			
Arthropoda	Insecta	Collembola		Collembola spp.	2						10	0.10			2			
Arthropoda	Insecta	Ephemeroptera	Caenidae	*Caenis spp.*	25	1					6.8	0.83						
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Maccaffertium spp.*	7	1					3.15	0.11					7	
Arthropoda	Insecta	Odonata	Coenagrionidae	Coenagrionidae spp.	5						6.1	0.15			5			
Arthropoda	Insecta	Odonata	Coenagrionidae	*Argia spp.*	9						8.3	0.36			9			
Arthropoda	Insecta	Odonata	Libellulidae	*Libellula spp.*	1						9.4	0.05			1			
Arthropoda	Insecta	Trichoptera	Polycentropodidae	*Cernotina spp.*	1			1			4	0.02				1		
Arthropoda	Insecta	Trichoptera	Leptoceridae	*Oecetis spp.*	2			1			5.1	0.05				2		
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche spp.*	7			1			6.6	0.22						
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia spp.*	37					37	5.5	0.99	37					37
Arthropoda	Insecta	Coleoptera	Elmidae	*Stenelmis spp.*	33						5.6	0.90	33				33	33
Arthropoda	Insecta	Coleoptera	Elmidae	*Microcylloepus spp.*	3						4	0.06	3					
Arthropoda	Insecta	Coleoptera	Elmidae	*Ancyronyx variegatus*	4						6.8	0.13	4					
Arthropoda	Insecta	Coleoptera	Hydrophilidae	*Berosus spp.*	1						8.8	0.04	1					
Arthropoda	Insecta	Coleoptera	Psephenidae	*Psephenus spp.*	10						2.35	0.11	10				10	
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum fallax group*	1				1		6.5	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	*Labrundinia spp.*	1				1		6.2	0.03						
Arthropoda	Insecta	Diptera	Tipulidae	*Prionocera spp.*	6						4	0.12			6			
Arthropoda	Insecta	Diptera	Stratiomyidae	*Odontomyia spp.*	1						8	0.04			1			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	39.03
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.54
Model % Chironomidae	20	19.03
Model % Coleoptera	10	32.72
Model % Oligochaeta	5	0.83
Model % Other	10	20.10
Sum of Difference		125.24
Sum of Difference * 0.5		62.62
Percent Model Affinity 100 - (Sum of Difference * 0.5)		37.38
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	25	113.64	100.00
Total Abundance	206		
% Ephemeroptera	0.97	1.58	1.58
% Plecoptera	0.00		
% Trichoptera	1.46		
% Chironomidae	0.97	99.03	99.03
% Dominant Taxon	17.96		
Biotic Index	5.95	59.51	59.51
% Coleoptera	42.72		
% Oligochaeta	5.83		
% Other	30.10		
% Plecoptera + Trichoptera (less Hydropsychidae)	1.46	4.09	4.09
% Scrapers	24.27	47.04	47.04
% Top 2 Dominant Taxa	33.98	95.40	95.40
EPT Index	5	45.45	45.45
EPT/EPT + Chironomidae Ratio	0.71		

Hilsenhoff Biotic Index Category	Fair

Final VSCI score	56.51

Little Bull Run - PC90 (Duplicate)
Multiple Habitat Sampling
Samples Collected 10/06/2016
Project #: 151270003

Results for LB-PC90(DUP)

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Platyhelminthes				Platyhelminthes spp.	7							0.00			7			
Mollusca	Gastropoda	Hygrophila	Physidae	*Physella spp.*	3						8.84	0.12			3			
Mollusca	Gastropoda	Hygrophila	Planorbidae	*Planorbella spp.*	11						6	0.29			11			
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula fluminea*	5						6.6	0.15			5			
Arthropoda	Insecta	Collembola		Collembola spp.	1						10	0.04			1			
Arthropoda	Insecta	Ephemeroptera	Caenidae	*Caenis spp.*	21	1					6.8	0.63						
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Maccaffertium spp.*	23	1					3.15	0.32					23	
Arthropoda	Insecta	Odonata	Gomphidae	*Dromogomphus spp.*	1						5.6	0.02			1			
Arthropoda	Insecta	Odonata	Coenagrionidae	*Argia spp.*	9						8.3	0.33			9			
Arthropoda	Insecta	Odonata	Coenagrionidae	*Enallagma spp.*	1						8.5	0.04			1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche spp.*	7			1			6.6	0.21						
Arthropoda	Insecta	Trichoptera	Philopotamidae	*Chimarra spp.*	5			1			3.3	0.07				5		
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia spp.*	32						5.5	0.78	32					32
Arthropoda	Insecta	Coleoptera	Elmidae	*Stenelmis spp.*	73					73	5.6	1.82	73				73	73
Arthropoda	Insecta	Coleoptera	Elmidae	*Ancyronyx variegatus*	1						6.8	0.03	1					
Arthropoda	Insecta	Coleoptera	Gyrinidae	*Gyretes iricolor*	1						5.8	0.03	1					
Arthropoda	Insecta	Coleoptera	Hydrophilidae	*Berosus spp.*	3						8.8	0.12	3					
Arthropoda	Insecta	Coleoptera	Dytiscidae	*Copelatus spp.*	1						10	0.04	1					
Arthropoda	Insecta	Coleoptera	Psephenidae	*Psephenus spp.*	8						2.35	0.08	8				8	
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum fallax group*	2				2		6.5	0.06						
Arthropoda	Insecta	Diptera	Chironomidae	*Ablabesmyia mallochi*	1				1		7.4	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus or Orthocladius*	1				1		4.1	0.02						
Arthropoda	Insecta	Diptera	Tipulidae	*Prionocera spp.*	6						4	0.11			6			
Arthropoda	Insecta	Heteroptera	Mesoveliidae	*Mesovelia spp.*	2						6	0.05			2			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	39.11
Model % Plecoptera	5	5.00
Model % Trichoptera	10	9.11
Model % Chironomidae	20	18.22
Model % Coleoptera	10	42.89
Model % Oligochaeta	5	5.00
Model % Other	10	10.44
Sum of Difference		129.78
Sum of Difference * 0.5		64.89
Percent Model Affinity 100 - (Sum of Difference * 0.5)		35.11
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	24	109.09	100.00
Total Abundance	225		
% Ephemeroptera	0.89	1.45	1.45
% Plecoptera	0.00		
% Trichoptera	0.89		
% Chironomidae	1.78	98.22	98.22
% Dominant Taxon	32.44		
Biotic Index	5.40	67.62	67.62
% Coleoptera	52.89		
% Oligochaeta	0.00		
% Other	20.44		
% Plecoptera + Trichoptera (less Hydropsychidae)	2.22	6.24	6.24
% Scrapers	46.22	89.58	89.58
% Top 2 Dominant Taxa	46.67	77.07	77.07
EPT Index	4	36.36	36.36
EPT/EPT + Chironomidae Ratio	0.50		

Hilsenhoff Biotic Index Category	Good

Final VSCI score	59.57

Neabsco Creek - PC60
Multiple Habitat Sampling
Samples Collected 10/04/2016
Project #: 151270003

Results for NB-PC60

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	5						6.1	0.18		5				
Mollusca	Gastropoda	Hygrophila	Physidae	*Physella spp.*	2						8.84	0.11			2			
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula fluminea*	2						6.6	0.08			2			
Arthropoda	Insecta	Collembola		Collembola spp.	1						10	0.06			1			
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Baetis spp.*	15	1					4.51	0.41						
Arthropoda	Insecta	Odonata	Calopterygidae	*Calopteryx spp.*	1						7.5	0.05			1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche spp.*	92			1		92	6.6	3.68						92
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Hydropsyche spp.*	16			1			4	0.39						16
Arthropoda	Insecta	Trichoptera	Philopotamidae	*Chimarra spp.*	4			1			3.3	0.08				4		
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia spp.*	1						5.5	0.03	1					
Arthropoda	Insecta	Coleoptera	Elmidae	*Ancyronyx variegatus*	6						6.8	0.25	6					
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum aviceps*	2				2		3.6	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemanniella spp.*	7				7		6.4	0.27						
Arthropoda	Insecta	Diptera	Tipulidae	*Antocha spp.*	3						4.4	0.08			3			
Arthropoda	Insecta	Diptera	Simuliidae	Simuliidae spp.	8						6	0.29			8			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	39.39
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.18
Model % Chironomidae	20	14.55
Model % Coleoptera	10	5.76
Model % Oligochaeta	5	1.97
Model % Other	10	0.30
Sum of Difference		75.15
Sum of Difference * 0.5		37.58
Percent Model Affinity 100 - (Sum of Difference * 0.5)		62.42
Percent Model Affinity Category		Slightly Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	15	68.18	68.18
Total Abundance	165		
% Ephemeroptera	0.61	0.99	0.99
% Plecoptera	0.00		
% Trichoptera	1.82		
% Chironomidae	5.45	94.55	94.55
% Dominant Taxon	55.76		
Biotic Index	6.00	58.79	58.79
% Coleoptera	4.24		
% Oligochaeta	3.03		
% Other	10.30		
% Plecoptera + Trichoptera (less Hydropsychidae)	2.42	6.81	6.81
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	65.45	49.92	49.92
EPT Index	4	36.36	36.36
EPT/EPT + Chironomidae Ratio	0.31		

Hilsenhoff Biotic Index Category	Fair

Final VSCI score	39.45

Purcell Branch - PC10
Multiple Habitat Sampling
Samples Collected 10/05/2016
Project #: 151270003

Results for PB-PC10

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	2						6.1	0.06		2				
Annelida	Clitellata	Tubificida	Naididae	*Nais pardalis*	10						8.7	0.42		10				
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula fluminea*	2						6.6	0.06			2			
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Baetis spp.*	7	1					4.51	0.15						
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Maccaffertium spp.*	4	1					3.15	0.06					4	
Arthropoda	Insecta	Odonata	Coenagrionidae	*Argia spp.*	2						8.3	0.08			2			
Arthropoda	Insecta	Odonata	Calopterygidae	*Calopteryx spp.*	1						7.5	0.04			1			
Arthropoda	Insecta	Trichoptera	Leptoceridae	*Oecetis spp.*	1			1			5.1	0.02				1		
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche spp.*	52			1		52	6.6	1.67						52
Arthropoda	Insecta	Trichoptera	Philopotamidae	*Chimarra spp.*	31			1			3.3	0.50				31		
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia spp.*	9						5.5	0.24	9					
Arthropoda	Insecta	Coleoptera	Elmidae	*Stenelmis spp.*	34						5.6	0.93	34				34	34
Arthropoda	Insecta	Coleoptera	Psephenidae	*Psephenus spp.*	5						2.35	0.06	5					
Arthropoda	Insecta	Diptera	Chironomidae	*Cladotanytarsus spp.*	1				1		4	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	*Tanytarsus spp.*	1				1		6.6	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum halterale group*	13				13		7.4	0.47						
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum aviceps*	2				2		3.6	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	*Rheotanytarsus spp.*	2				2		6.5	0.06						
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemanniella spp.*	10				10		6.4	0.31						
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemanniella xena*	1				1		8	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	*Paratanytarsus spp.*	1				1		8	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus or Orthocladius*	1				1		4.1	0.02						
Arthropoda	Insecta	Diptera	Tipulidae	Tipulidae spp.	1						4.9	0.02			1			
Arthropoda	Insecta	Diptera	Simuliidae	Simuliidae spp.	3						6	0.09			3			
Arthropoda	Insecta	Heteroptera	Mesoveliidae	*Mesovelia spp.*	5						6	0.15			5			
Arthropoda	Insecta	Megaloptera	Corydalidae	*Corydalus spp.*	4						5.16	0.10			4			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	39.02
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.54
Model % Chironomidae	20	4.39
Model % Coleoptera	10	13.41
Model % Oligochaeta	5	0.85
Model % Other	10	1.22
Sum of Difference		72.44
Sum of Difference * 0.5		36.22
Percent Model Affinity 100 - (Sum of Difference * 0.5)		63.78
Percent Model Affinity Category		Slightly Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	26	118.18	100.00
Total Abundance	205		
% Ephemeroptera	0.98	1.59	1.59
% Plecoptera	0.00		
% Trichoptera	1.46		
% Chironomidae	15.61	84.39	84.39
% Dominant Taxon	25.37		
Biotic Index	5.70	63.30	63.30
% Coleoptera	23.41		
% Oligochaeta	5.85		
% Other	8.78		
% Plecoptera + Trichoptera (less Hydropsychidae)	15.61	43.85	43.85
% Scrapers	18.54	35.92	35.92
% Top 2 Dominant Taxa	41.95	83.89	83.89
EPT Index	5	45.45	45.45
EPT/EPT + Chironomidae Ratio	0.14		

Hilsenhoff Biotic Index Category	Fair

Final VSCI score	57.30

Attachment 2
References

Barbour, M. T., J. Gerritsen, B. D. Snyder and J. B. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates, and fish. 2nd ed. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

Hilsenhoff, W. L. 1987. An improved biotic index of organic stream pollution. The Great Lakes Entomologist 20 (1): 31-39.

Merritt, R. W., K. W. Cummings and M. B. Berg. 2008. An introduction to the aquatic insects of North America. 4th ed. Kendall Hunt Publishing Company, Dubuque, IA.

North Carolina Department of Environmental Quality. 2016. Standard operating procedures for the collection and analysis of benthic macroinvertebrates. Division of Water Resources. Raleigh, North Carolina. February 2016.

Novak, M. A. and R. W. Bode. 1992. Percent model affinity: a new measure of macroinvertebrate community composition. Journal of North American Benthological Society 11 (1): 80-85.

Tennessee Department of Environment and Conservation. 2011. Quality system standard operating procedure for macroinvertebrate stream surveys. Division of Water Pollution Control. Nashville, Tennessee.

Virginia Department of Environmental Quality. 2008. Biological monitoring program: quality assurance project plan for wadeable streams and rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, Richmond, VA.

June 16, 2017

Mr. Ben Green
Amec Foster Wheeler
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Subject: **Prince William County Multiple Habitat Sampling Method Report**
Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, Purcell Branch
Amec Foster Wheeler Project No.: 151270003

Dear Mr. Green:

Amec Foster Wheeler (Gainesville office), Environment & Infrastructure, Inc. (Amec Foster Wheeler) completed benthic macroinvertebrate determinations for samples collected by Amec Foster Wheeler (Chantilly office), in April 2017. Amec Foster Wheeler received a total of five samples, one from each of the following locations: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch. The results of the taxonomic analyses are presented in this report.

Multiple Habitat Sampling Method

Methods and Procedures

All samples collected by Amec Foster Wheeler, Chantilly office, in April 2017, were received by Amec Foster Wheeler taxonomy laboratory at Gainesville, Florida, where they were logged in and processed. The samples were sorted (i.e. organisms removed from debris) and organisms were identified and enumerated by a qualified taxonomist according to Section 7.2 of the U.S. Environmental Protection Agency's (USEPA) *"Rapid Bioassessment Protocol for Use in Wadeable Streams and Rivers"* (RBP) (Barbour *et al.*, 1999). Eight metrics were calculated including the Biotic Index, using guidance from Hilsenhoff (1987); the Percent Model Affinity (PMA), using guidance from Novak and Bode (1992); and the Virginia Stream Condition Index, using guidance from Virginia Department of Environmental Quality (2008). The scraper taxa and tolerance values were identified according to life history information from RBP (Barbour *et al.*, 1999); "*An Introduction to the Aquatic Insects of North America"* (Merritt *et al.*, 2008); *"Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys*" (Tennessee Department of Environment and Conservation, 2011); and *"Standard Operating Procedures for the Collection and Analysis of Benthic Macroinvertebrates"* (North Carolina Department of Environmental Quality, 2016). Quality assurance and quality control checks were conducted according to the EPA RBP on Laboratory Quality Control for Macroinvertebrate Taxonomic Identification (Barbour *et al.*, 1999). Quality assurance/quality control requirements for sample picking and taxonomic identification were conducted by an Amec Foster Wheeler Senior Taxonomist.

Benthic Macroinvertebrate Results

The benthic invertebrate community data were used to generate metrics outlined in the Amec Foster Wheeler draft sampling plan. The Multiple Habitat Sampling assessments conducted at the five locations are summarized below in **Table 1**.

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Table 1. Summary of Results of Multiple Habitat Samples

Metrics	Site Locations				
	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Taxa Richness	22	24	27	33	28
Abundance	161	190	193	161	167
EPT Index	3	5	2	6	4
EPT/EPT + Chironomidae Ratio	0.14	0.09	0.08	0.22	0.03
Percent Dominant Taxon	42.24	47.37	28.50	17.39	26.95
Percent Chironomidae	43.48	61.05	57.51	51.55	68.26
Biotic Index (BI)	6.54	5.15	6.10	5.96	5.28
Biotic Index (BI) Category	Fairly Poor	Good	Fair	Fair	Good
Percent Model Affinity (PMA)	37.42	50.79	49.33	48.91	39.67
Percent Model Affinity (PMA) Category	Moderately Impacted	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted
VSCI	37.17	39.85	38.66	47.03	41.71

Source: Amec Foster Wheeler, 2017 Prepared by: RJM Checked by: NP

Taxonomic identifications and abundances of the benthic invertebrates and metric calculations for each sample are included in Attachment 1. References are listed in Attachment 2.

Closing

We appreciate the opportunity to provide ecological services to you. Please do not hesitate to contact me if you have questions, or need to request further information. You can reach me by phone at (352) 333-3634, or via email at shannon.mcmorrow@amecfw.com.

Sincerely,
Amec Foster Wheeler Environment & Infrastructure, Inc.

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Attachments:

Attachment 1: Tabulated Data
Attachment 2: References

Attachment 1
Tabulated Data

Multiple Habitat Sampling
Samples Collected 04/2017
Project #: 151270003

Metrics	Site Locations				
	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Taxa Richness	22	24	27	33	28
Abundance	161	190	193	161	167
EPT Index	3	5	2	6	4
EPT/EPT + Chironomidae Ratio	0.14	0.09	0.08	0.22	0.03
Percent Dominant Taxon	42.24	47.37	28.50	17.39	26.95
Percent Chironomidae	43.48	61.05	57.51	51.55	68.26
Biotic Index (BI)	6.54	5.15	6.10	5.96	5.28
Biotic Index (BI) Category	Fairly Poor	Good	Fair	Fair	Good
Percent Model Affinity (PMA)	37.42	50.79	49.33	48.91	39.67
Percent Model Affinity (PMA) Category	Moderately Impacted	Slightly Impacted	Moderately Impacted	Moderately Impacted	Moderately Impacted
VSCI	37.17	39.85	38.66	47.03	41.71

Cow Branch
Multiple Habitat Sampling
Samples Collected 04/19/2017
Project #: 151270003

Results for Cow Branch

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	1						6.1	0.04		1				
Annelida	Clitellata	Tubificida	Naididae	Naidinae spp.	1							0.00		1				
Annelida	Clitellata	Tubificida	Naididae	Nais communis	68					68	8.7	3.67		68				68
Annelida	Clitellata	Opisthopora	Sparganophilidae	Sparganophilus spp.	1							0.00		1				
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	7			7			6.6	0.29						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Macrostemum spp.	1			1			3.4	0.02						
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Hydroptila spp.	3			3			6.5	0.12				3		
Arthropoda	Insecta	Coleoptera	Elmidae	Dubiraphia spp.	1						5.5	0.03	1					
Arthropoda	Insecta	Coleoptera	Elmidae	Microcylloepus spp.	1						4	0.02	1					
Arthropoda	Insecta	Coleoptera	Dytiscidae	Uvarus spp.	1						8	0.05	1					
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	4				4		6	0.15						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	1				1		9.3	0.06						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum flavum	1				1		5.7	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	2				2		8.7	0.11						
Arthropoda	Insecta	Diptera	Chironomidae	Dicrotendipes spp.	1				1		7.2	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Orthocladius spp.	21				21		4.4	0.57						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	3				3		8	0.15						
Arthropoda	Insecta	Diptera	Chironomidae	Parametriocnemus spp.	3				3		3.9	0.07						
Arthropoda	Insecta	Diptera	Chironomidae	Rheocricotopus spp.	5				5		4.7	0.15						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	29				29		4.1	0.74						29
Arthropoda	Insecta	Diptera	Simuliidae	Simulium spp.	1						4.4	0.03			1			
Arthropoda	Insecta	Diptera	Empididae	Hemerodromia spp.	5						6	0.19			5			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	40.00
Model % Plecoptera	5	5.00
Model % Trichoptera	10	3.17
Model % Chironomidae	20	23.48
Model % Coleoptera	10	8.14
Model % Oligochaeta	5	39.10
Model % Other	10	6.27
Sum of Difference		125.16
Sum of Difference * 0.5		62.58
Percent Model Affinity 100 - (Sum of Difference * 0.5)		37.42
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	22	100.00	100.00
Total Abundance	161		
% Ephemeroptera	0.00	0.00	0.00
% Plecoptera	0.00		
% Trichoptera	6.83		
% Chironomidae	43.48	56.52	56.52
% Dominant Taxon	42.24		
Biotic Index	6.54	50.90	50.90
% Coleoptera	1.86		
% Oligochaeta	44.10		
% Other	3.73		
% Plecoptera + Trichoptera (less Hydropsychidae)	1.86	5.23	5.23
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	60.25	57.44	57.44
EPT Index	3	27.27	27.27
EPT/EPT + Chironomidae Ratio	0.14		

Hilsenhoff Biotic Index Category	Fairly Poor

Final VSCI score	37.17

Dawkins Branch
Multiple Habitat Sampling
Samples Collected 04/20/2017
Project #: 151270003

Results for Dawkins Branch

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Platyhelminthes				Platyhelminthes spp.	3							0.00						
Nemertea	Enopla	Hoplonemertea	Tetrastemmatidae	Prostoma spp.	1						6.6	0.03						
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	2						6.1	0.06		2				
Annelida	Clitellata	Tubificida	Naididae	Naidinae spp.	1							0.00		1				
Annelida	Clitellata	Tubificida	Naididae	Nais communis	1						8.7	0.05		1				
Annelida	Clitellata	Tubificida	Naididae	Nais pardalis	7						8.7	0.32		7				
Annelida	Clitellata	Tubificida	Naididae	Ophidonais serpentina	2						2	0.02		2				
Mollusca	Bivalvia	Veneroida	Corbiculidae	Corbicula fluminea	13						6.6	0.45			13			
Arthropoda	Insecta	Ephemeroptera	Caenidae	Caenis spp.	2	2					6.8	0.07						
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae spp.	1	1					4	0.02						
Arthropoda	Insecta	Odonata	Coenagrionidae	Argia spp.	1						8.3	0.04			1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	5			5			6.6	0.17						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Macrostemum spp.	1			1			3.4	0.02						
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Orthotrichia spp.	2			2			8.29	0.09				2	2	
Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis spp.	27						5.6	0.80	27					27
Arthropoda	Insecta	Coleoptera	Haliplidae	Peltodytes spp.	2						8.5	0.09	2					
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	9				9		6	0.28						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus buckleyi	2				2		6.76	0.07						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	1				1		8.7	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus exiguus group	13				13		6.5	0.44						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	1				1		8	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	90				90	90	4.1	1.94						90
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae spp.	2						5.7	0.06			2			
Arthropoda	Insecta	Diptera	Simuliidae	Simulium spp.	1						4.4	0.02			1			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	38.42
Model % Plecoptera	5	5.00
Model % Trichoptera	10	5.79
Model % Chironomidae	20	41.05
Model % Coleoptera	10	5.26
Model % Oligochaeta	5	1.84
Model % Other	10	1.05
Sum of Difference		98.42
Sum of Difference * 0.5		49.21
Percent Model Affinity 100 - (Sum of Difference * 0.5)		50.79
Percent Model Affinity Category		Slightly Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	24	109.09	100.00
Total Abundance	190		
% Ephemeroptera	1.58	2.58	2.58
% Plecoptera	0.00		
% Trichoptera	4.21		
% Chironomidae	61.05	38.95	38.95
% Dominant Taxon	47.37		
Biotic Index	5.15	71.30	71.30
% Coleoptera	15.26		
% Oligochaeta	6.84		
% Other	8.95		
% Plecoptera + Trichoptera (less Hydropsychidae)	1.05	2.96	2.96
% Scrapers	1.05	2.04	2.04
% Top 2 Dominant Taxa	61.58	55.52	55.52
EPT Index	5	45.45	45.45
EPT/EPT + Chironomidae Ratio	0.09		

Hilsenhoff Biotic Index Category	Good
Final VSCI score	39.85

Little Bull Run
Multiple Habitat Sampling
Samples Collected 04/21/2017
Project #: 151270003

Results for Little Bull Run

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Platyhelminthes				Platyhelminthes spp.	2							0.00			2			
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	1						6.1	0.03		1				
Annelida	Clitellata	Tubificida	Naididae	Pristina osborni	1						9.56	0.05		1				
Annelida	Clitellata	Tubificida	Naididae	Nais pardalis	6						8.7	0.27		6				
Mollusca	Gastropoda	Hygrophila	Physidae	Physella spp.	24						8.84	1.10			24			24
Mollusca	Gastropoda	Hygrophila	Planorbidae	Planorbella scalaris	1						6.82	0.04			1			
Mollusca	Bivalvia	Veneroida	Corbiculidae	Corbicula fluminea	2						6.6	0.07			2			
Arthropoda	Insecta	Ephemeroptera	Caenidae	Caenis spp.	7	7					6.8	0.25						
Arthropoda	Insecta	Odonata	Coenagrionidae	Coenagrionidae spp.	1						6.1	0.03			1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	3			3			6.6	0.10						
Arthropoda	Insecta	Coleoptera	Elmidae	Dubiraphia spp.	11						5.5	0.31	11					
Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis spp.	16						5.6	0.46	16					
Arthropoda	Insecta	Coleoptera	Psephenidae	Psephenus spp.	2						2.35	0.02	2					
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	9				9		6	0.28						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	3				3		9.3	0.14						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	4				4		6.6	0.14						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum scalaenum group	1				1		8.5	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus exiguus group	3				3		6.5	0.10						
Arthropoda	Insecta	Diptera	Chironomidae	Dicrotendipes spp.	3				3		7.2	0.11						
Arthropoda	Insecta	Diptera	Chironomidae	Stenochironomus spp.	1				1		6.4	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Corynoneura spp.	1				1		6.01	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	23				23		8	0.95						
Arthropoda	Insecta	Diptera	Chironomidae	Nanocladius spp.	1				1		7.2	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Rheocricotopus spp.	7				7		4.7	0.17						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	55				55	55	4.1	1.17						55
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae spp.	2						5.7	0.06			2			
Arthropoda	Insecta	Diptera	Empididae	Hemerodromia spp.	3						6	0.09			3			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	36.37
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.45
Model % Chironomidae	20	37.51
Model % Coleoptera	10	5.03
Model % Oligochaeta	5	0.85
Model % Other	10	8.13
Sum of Difference		101.35
Sum of Difference * 0.5		50.67
Percent Model Affinity 100 - (Sum of Difference * 0.5)		49.33
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	27	122.73	100.00
Total Abundance	193		
% Ephemeroptera	3.63	5.92	5.92
% Plecoptera	0.00		
% Trichoptera	1.55		
% Chironomidae	57.51	42.49	42.49
% Dominant Taxon	28.50		
Biotic Index	6.10	57.33	57.33
% Coleoptera	15.03		
% Oligochaeta	4.15		
% Other	18.13		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.00	0.00	0.00
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	40.93	85.36	85.36
EPT Index	2	18.18	18.18
EPT/EPT + Chironomidae Ratio	0.08		

Hilsenhoff Biotic Index Category	Fair

Final VSCI score	38.66

Neabsco Creek
Multiple Habitat Sampling
Samples Collected 04/19/2017
Project #: 151270003

Results for Neabsco Creek

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	2						6.1	0.08		2				
Annelida	Clitellata	Tubificida	Naididae	Pristina americana	1						9.56	0.06		1				
Annelida	Clitellata	Tubificida	Naididae	Nais communis	27						8.7	1.46		27				27
Annelida	Clitellata	Tubificida	Naididae	Nais pseudobtusa	3						8.88	0.17		3				
Annelida	Clitellata	Tubificida	Naididae	Slavina appendiculata	2						8.4	0.10		2				
Annelida	Clitellata	Lumbriculida	Lumbriculidae	Lumbriculidae spp.	1						7.3	0.05		1				
Annelida	Clitellata	Enchytraeida	Enchytraeidae	Enchytraeidae spp.	2						10	0.12		2				
Annelida	Clitellata	Opisthopora	Sparganophilidae	Sparganophilus spp.	1							0.00		1				
Mollusca	Bivalvia	Veneroida	Corbiculidae	Corbicula fluminea	1						6.6	0.04			1			
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae spp.	15	15					4	0.37						
Arthropoda	Insecta	Odonata	Calopterygidae	Calopteryx spp.	1						7.5	0.05						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	2			2			6.6	0.08						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsyche spp.	3			3			4	0.07						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Macrostemum spp.	2			2			3.4	0.04						
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Hydroptila spp.	1			1			6.5	0.04				1		
Arthropoda	Insecta	Trichoptera	Philopotamidae	Chimarra spp.	1			1			3.3	0.02				1		
Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis spp.	2						5.6	0.07	2					
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	9				9		6	0.34						
Arthropoda	Insecta	Diptera	Chironomidae	Diamesinae spp.	6				6		8.12	0.30						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	1				1		9.3	0.06						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	1				1		6.6	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum flavum	8				8		5.7	0.28						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	3				3		8.7	0.16						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus exiguus group	3				3		6.5	0.12						
Arthropoda	Insecta	Diptera	Chironomidae	Corynoneura spp.	3				3		6.01	0.11						
Arthropoda	Insecta	Diptera	Chironomidae	Orthocladius spp.	28				28	28	4.4	0.77						28
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	3				3		8	0.15						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemannimyia grp. sp.	1				1		8.4	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	Parametriocnemus spp.	6				6		3.9	0.15						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	11				11		4.1	0.28						
Arthropoda	Insecta	Diptera	Tipulidae	Antocha spp.	1						4.4	0.03			1			
Arthropoda	Insecta	Diptera	Simuliidae	Simulium spp.	7						4.4	0.19			7			
Arthropoda	Insecta	Diptera	Empididae	Hemerodromia spp.	3						6	0.11			3			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	30.68
Model % Plecoptera	5	5.00
Model % Trichoptera	10	4.41
Model % Chironomidae	20	31.55
Model % Coleoptera	10	8.76
Model % Oligochaeta	5	19.22
Model % Other	10	2.55
Sum of Difference		102.17
Sum of Difference * 0.5		51.09
Percent Model Affinity 100 - (Sum of Difference * 0.5)		48.91
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	33	150.00	100.00
Total Abundance	161		
% Ephemeroptera	9.32	15.20	15.20
% Plecoptera	0.00		
% Trichoptera	5.59		
% Chironomidae	51.55	48.45	48.45
% Dominant Taxon	17.39		
Biotic Index	5.96	59.40	59.40
% Coleoptera	1.24		
% Oligochaeta	24.22		
% Other	7.45		
% Plecoptera + Trichoptera (less Hydropsychidae)	1.24	3.49	3.49
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	34.16	95.14	95.14
EPT Index	6	54.55	54.55
EPT/EPT + Chironomidae Ratio	0.22		

Hilsenhoff Biotic Index Category	Fair
Final VSCI score	47.03

Purcell Branch
Multiple Habitat Sampling
Samples Collected 04/20/2017
Project #: 151270003

Results for Purcell Branch

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	11						6.1	0.40		11				
Annelida	Clitellata	Tubificida	Naididae	Nais communis	3						8.7	0.16		3				
Annelida	Clitellata	Tubificida	Naididae	Nais pardalis	2						8.7	0.10		2				
Annelida	Clitellata	Tubificida	Naididae	Nais pseudobtusa	6						8.88	0.32		6				
Annelida	Clitellata	Enchytraeida	Enchytraeidae	Enchytraeidae spp.	1						10	0.06		1				
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae spp.	10	1					4	0.24						
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Maccaffertium spp.	2	1					3.15	0.04						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsyche spp.	1			1			4	0.02						
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Hydroptila spp.	2			1			6.5	0.08				2		
Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis spp.	8						5.6	0.27	8					
Arthropoda	Insecta	Coleoptera	Psephenidae	Psephenus spp.	1						2.35	0.01	1					
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	6				6		6	0.22						
Arthropoda	Insecta	Diptera	Chironomidae	Cladotanytarsus spp.	1				1		4	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	2				2		6.6	0.08						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum scalaenum group	2				2		8.5	0.10						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum flavum	2				2		5.7	0.07						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	1				1		8.7	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus exiguus group	4				4		6.5	0.16						
Arthropoda	Insecta	Diptera	Chironomidae	Corynoneura spp.	4				4		6.01	0.14						
Arthropoda	Insecta	Diptera	Chironomidae	Orthocladius spp.	12				12		4.4	0.32						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	2				2		8	0.10						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemannimyia grp. sp.	9				9		8.4	0.45						
Arthropoda	Insecta	Diptera	Chironomidae	Parametriocnemus spp.	17				17		3.9	0.40						17
Arthropoda	Insecta	Diptera	Chironomidae	Rheocricotopus spp.	7				7		4.7	0.20						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	45				45	45	4.1	1.10						45
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae spp.	2						5.7	0.07			2			
Arthropoda	Insecta	Diptera	Tipulidae	Tipulidae spp.	1						4.9	0.03			1			
Arthropoda	Insecta	Diptera	Simuliidae	Simulium spp.	3						4.4	0.08			3			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	38.80
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.80
Model % Chironomidae	20	48.26
Model % Coleoptera	10	4.61
Model % Oligochaeta	5	8.77
Model % Other	10	6.41
Sum of Difference		120.66
Sum of Difference * 0.5		60.33
Percent Model Affinity 100 - (Sum of Difference * 0.5)		39.67
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	28	127.27	100.00
Total Abundance	167		
% Ephemeroptera	1.20	1.95	1.95
% Plecoptera	0.00		
% Trichoptera	1.20		
% Chironomidae	68.26	31.74	31.74
% Dominant Taxon	26.95		
Biotic Index	5.28	69.37	69.37
% Coleoptera	5.39		
% Oligochaeta	13.77		
% Other	3.59		
% Plecoptera + Trichoptera (less Hydropsychidae)	1.20	3.36	3.36
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	37.13	90.86	90.86
EPT Index	4	36.36	36.36
EPT/EPT + Chironomidae Ratio	0.03		

Hilsenhoff Biotic Index Category	Good

Final VSCI score	41.71

Attachment 2
References

Barbour, M. T., J. Gerritsen, B. D. Snyder and J. B. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates, and fish. 2nd ed. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

Hilsenhoff, W. L. 1987. An improved biotic index of organic stream pollution. The Great Lakes Entomologist 20 (1): 31-39.

Merritt, R. W., K. W. Cummings and M. B. Berg. 2008. An introduction to the aquatic insects of North America. 4th ed. Kendall Hunt Publishing Company, Dubuque, IA.

North Carolina Department of Environmental Quality. 2016. Standard operating procedures for the collection and analysis of benthic macroinvertebrates. Division of Water Resources. Raleigh, North Carolina. February 2016.

Novak, M. A. and R. W. Bode. 1992. Percent model affinity: a new measure of macroinvertebrate community composition. Journal of North American Benthological Society 11 (1): 80-85.

Tennessee Department of Environment and Conservation. 2011. Quality system standard operating procedure for macroinvertebrate stream surveys. Division of Water Pollution Control. Nashville, Tennessee.

Virginia Department of Environmental Quality. 2008. Biological monitoring program: quality assurance project plan for wadeable streams and rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, Richmond, VA.

amec foster wheeler

To: Robert Jocz, Environmental Engineer, Prince William County
From: Lynne Mowery, Amec Foster Wheeler
Cc:
Date: 2/5/16
Re: Site Reconnaissance Technical Memorandum

Prince William County (County) is required to conduct biological stream monitoring through Section I.C.1 of its MS4 permit, dated December 17, 2014. The permit requires the County to monitor five stream sites twice per year using an approach based on 'USEPA's Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers" (RBP). The monitoring shall include an assessment of the benthic macroinvertebrate community and habitat assessment.

The County has selected five sites for biological monitoring that correspond to the locations of its stream monitoring program:

A. Cow Branch at Mellot Road
B. Neabsco Creek at Delaney Road
C. Purcell Branch at Purcell Road
D. Dawkins Branch at Wellington Road
E. Little Bull Run at Catharpin Road

Amec Foster Wheeler staff conducted site reconnaissance visits during the week of 12/14/15, and selected five sampling locations pending County approval. Prior to conducting site visits, Amec Foster Wheeler developed a site evaluation protocol based on the RBP. This protocol incorporates three components used to characterize water quality within a watershed: (1) physical and chemical data, (2) habitat assessment, and (3) benthic macroinvertebrate collection. These initial reconnaissance visits focused on the first two components since they are indicative of a stream reach's suitability for supporting a diverse aquatic community.

Amec Foster Wheeler completed a desktop analysis of the five proposed sites prior to conducting site reconnaissance. This included delineating total catchment area draining to each stream branch, characterizing the surrounding land use, and identifying potential 'problem areas' along each stream reach that could be the result of tributaries and stormwater outfalls.

Before conducting a habitat evaluation at each site, site investigators identified a stream reach located greater than 100 meters upstream from road crossings or major tributaries that contained a variety of habitat types. Site evaluations involved recording representative measurements of physical channel characteristics (width, depth, velocity) and completing a 'baseline' habitat assessment *according to RBP Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets.* These habitat assessments are designed to allow an assessor to objectively score each stream on a number of parameters (e.g. bank stability, velocity/depth regime, channel alteration, etc.) which evaluate the stream's suitability to support a diverse aquatic community representative of water quality throughout its contributing catchment. These baseline analyses were compiled within Amec Foster Wheeler's database and will inform future water quality investigations at these monitoring sites.

Suitable monitoring reaches spanning greater than 100 meters were identified at each of the County-recommended sites, though Amec Foster Wheeler has offered alternative initial sampling points due to field observations of contributing features surrounding the stream within the upstream, downstream, or riparian areas.

Appendix A: Site Recommendations

Location	Little Bull Run; Gainesville (sampled 12/14)
Accessibility	Via roadway, wide shoulder at crossing.
Surrounding Landscape	High density development and golf courses immediately surrounding site. Upstream representative reach is heavily forested.
Instream Conditions	Sanitary sewer crossing immediately upstream of bridge creates a backwater effect. Upstream reach has good mix of riffles and runs.
Recommended Site	Upstream from bridge and sewer crossing backwater.
Other	Potential illicit discharge – foamy deposit observed.

Location	Dawkins Branch; Manassas (sampled 12/14)
Accessibility	Via roadway, pull off point to gated entry. Site has been used for illegal dumping (TV and refuse observed).
Surrounding Landscape	Surrounding industrial/commercial land use. Construction contractor storage site downstream of representative reach where silt fence appears to be only partially effective.
Instream Conditions	Beaver dam upstream of representative reach which acts as additional in-line detention. Dam is susceptible to overtopping and breaching during larger storm events. Downstream reach is starved of sediment during periods of lower flow due to the trapping efficiency of the beaver dam. Additional flow impediments downstream such as LWD in channel.
Recommended Site	Downstream from beaver dam. May be subject to influence from large sediment slug flows following dam rupture.
Other	Unmapped outfall discovered downstream from representative reach, unknown contribution from surrounding development.

Location	Purcell Branch; Manassas (sampled 12/16)
Accessibility	Via roadway, wide shoulder after bridge.
Surrounding Landscape	Old agricultural fencing is evidence of previous land usage as pasture. Surrounding watershed contains low density development and forested areas.
Instream Conditions	Banks are severely incised (>2m) at first bend, apparently resulting from stormwater drainage from residential development outfall. Old silt fencing visible along bank. Long, deep run lies upstream, containing significant leaf pack and numerous fish. Suitable stretch identified upstream from deeper run, with mixture of riffles, runs, and pools.
Recommended Site	Representative reach lies ~1/4 mile upstream from county-recommended site, but other reaches do not capture habitat diversity.
Other	Some stormwater outfalls downstream of recommended site, but site is >100m from potential mixing points.

Location	Neabsco Creek; Dale City / Woodbridge (sampled 12/16)
Accessibility	Accessed via trail at end of Savannah Drive, limited public parking available.
Surrounding Landscape	Watershed contains highest proportion of forested to developed area.
Instream Conditions	Well forested riparian border provides ideal bank conditions, and best-observed habitat variability. Furthest downstream reach has a sanitary sewer crossing creating a backwater area, also fed by heavily incised urban stream and the accompanying sediment. Little to no fish observed in reach despite habitat variability, likely due to presence of sewer crossing acting as migration barrier
Recommended Site	Upstream from backwater area.
Other	Insignificant contributions from outfalls running down into stream valley.

Location	Cow Branch; Woodbridge (sampled 12/16)
Accessibility	Mellot Road is private drive, but property owner indicated we had permission. Future notification is recommended.
Surrounding Landscape	Rapidly developed high-density housing contributes high volume and intensity of stormwater runoff.
Instream Conditions	Evidence of heavy bank armoring using VDOT CLASS I & II riprap along majority of branch between Opitz Blvd. and Jefferson Davis Hwy. Heavily armored banks, denuded riparian area upstream from bridge at Mellot Rd. Stormwater outfall proximity is unfavorable to benthic macroinvertebrate sampling. Habitat downstream of bridge is more suitable, with a mature forested riparian area.
Recommended Site	~200m downstream from bridge provides adequate habitat variety, although macroinvertebrate population likely to be smaller due to recent restoration efforts.
Other	Has any benthic monitoring of the recommended reach been conducted before or after recent stream restoration?

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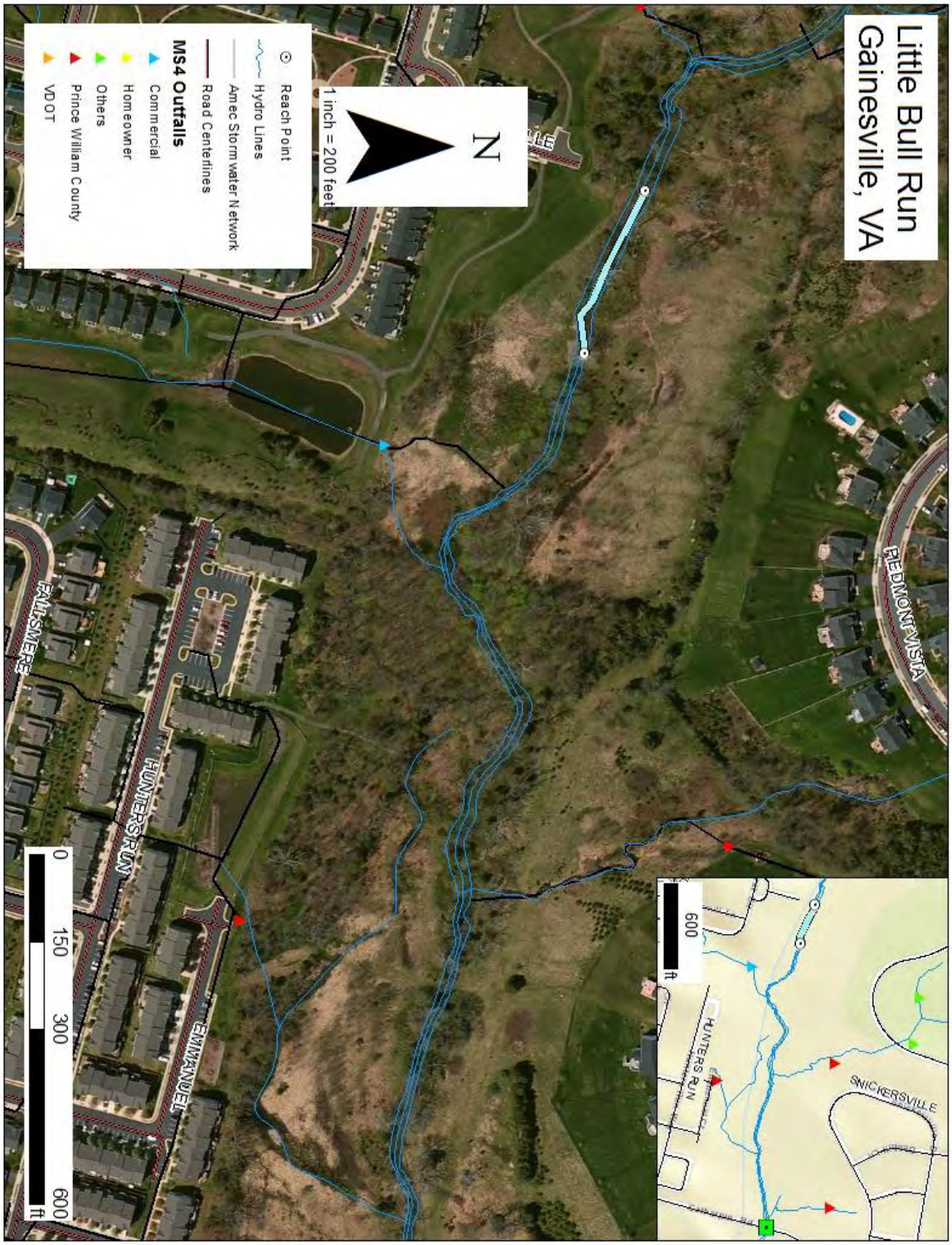
Appendix B: Site Maps


Little Bull Run
Gainesville, VA
N
1 inch = 200 feet
Reach Point
Hydro Lines
Amec Storm water N etwork
Road Centerlines
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
REDMONT VISTA
FAIRSMERE
HUNTERSRUN
EMMANUEL
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HUNTERS RUN
SNICKERSVILLE

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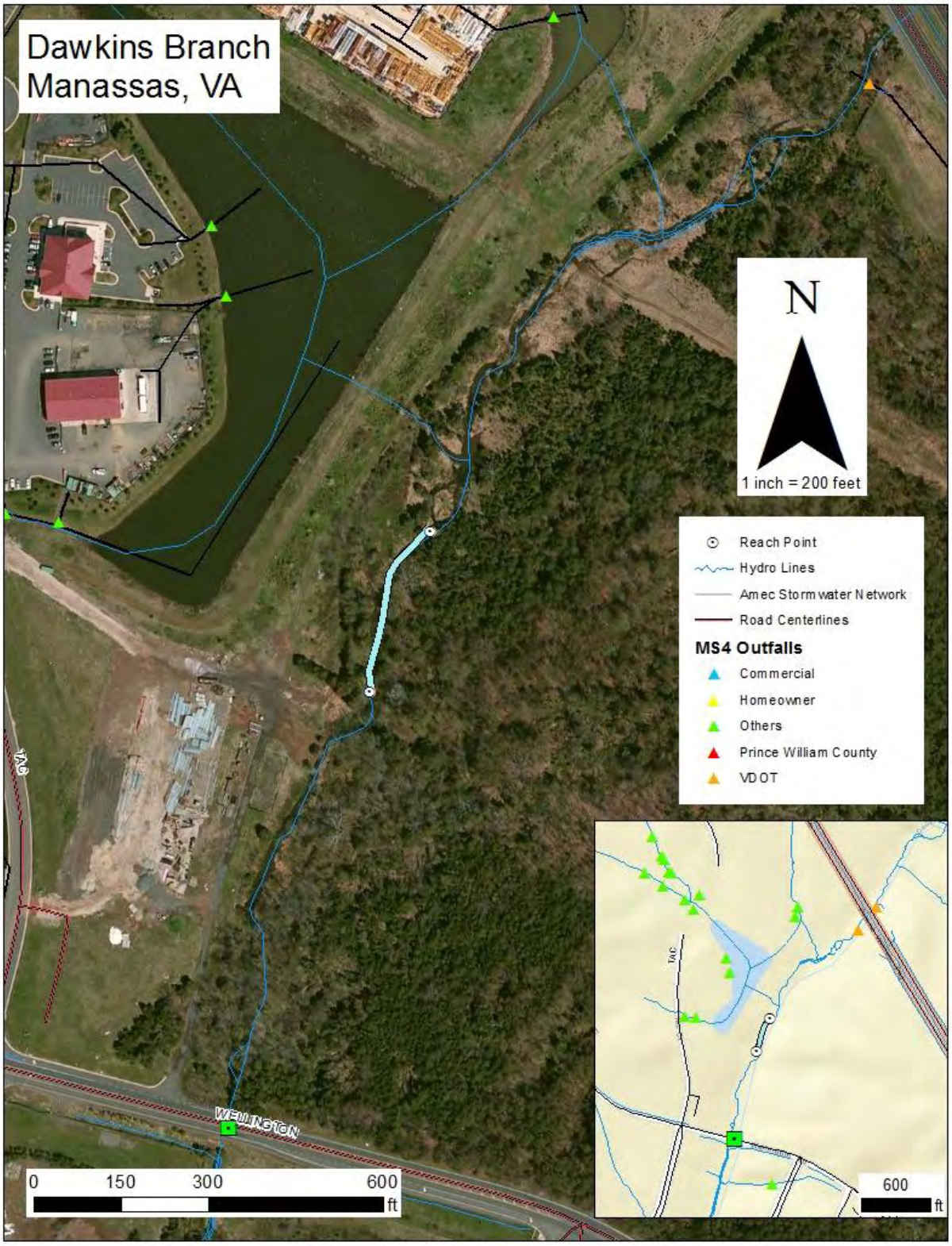
Dawkins Branch
Manassas, VA
N
1 inch = 200 feet
Reach Point
Hydro Lines
Amec Stormwater Network
Road Centerlines
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
WELLINGTON
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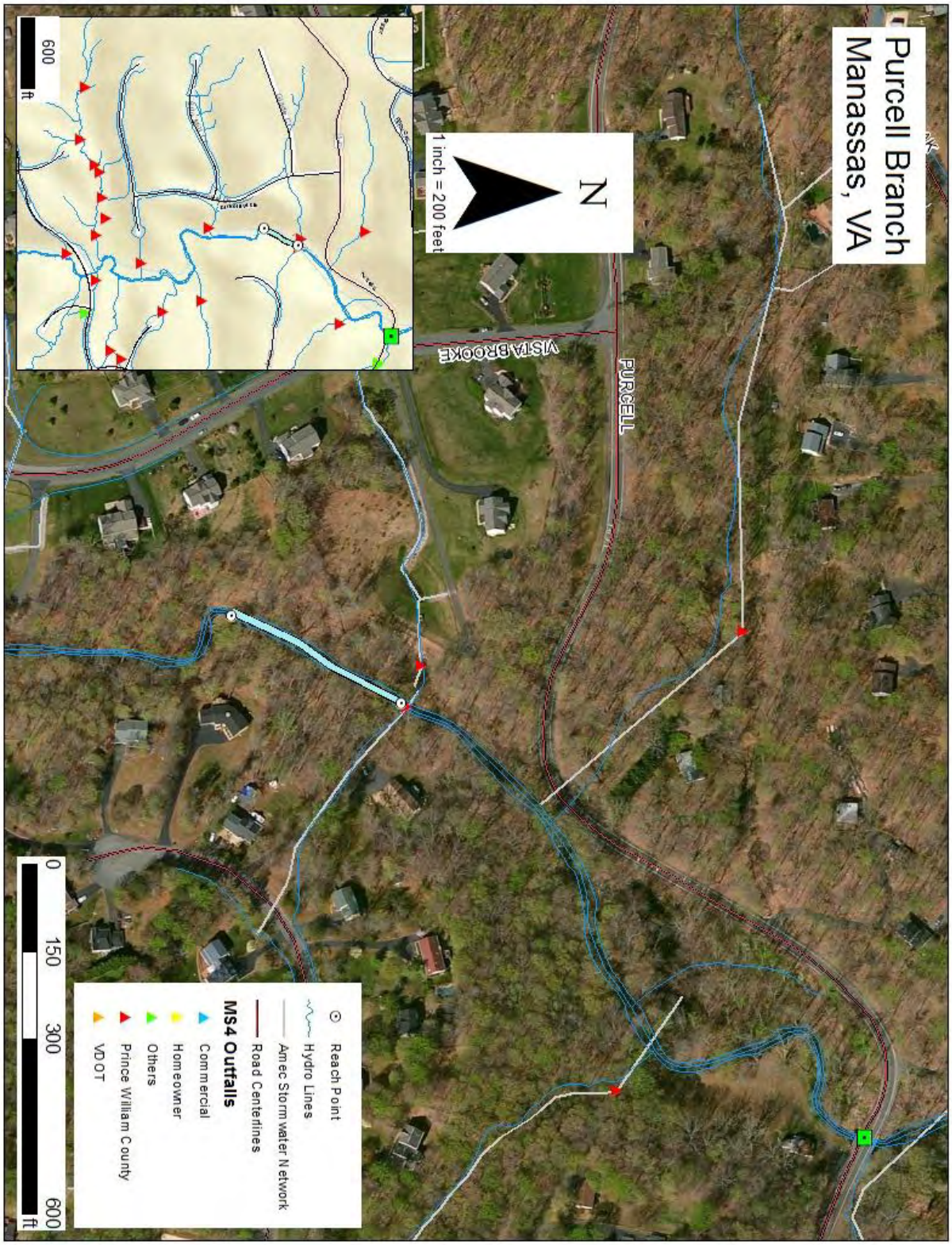
Purcell Branch
Manassas, VA
N
1 inch = 200 feet
VISTA BROOKE
PURCELL
600
ft
0
150
300
600
ft
Reach Point
Hydro Lines
Amec Stormwater Network
Road Centerlines
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT

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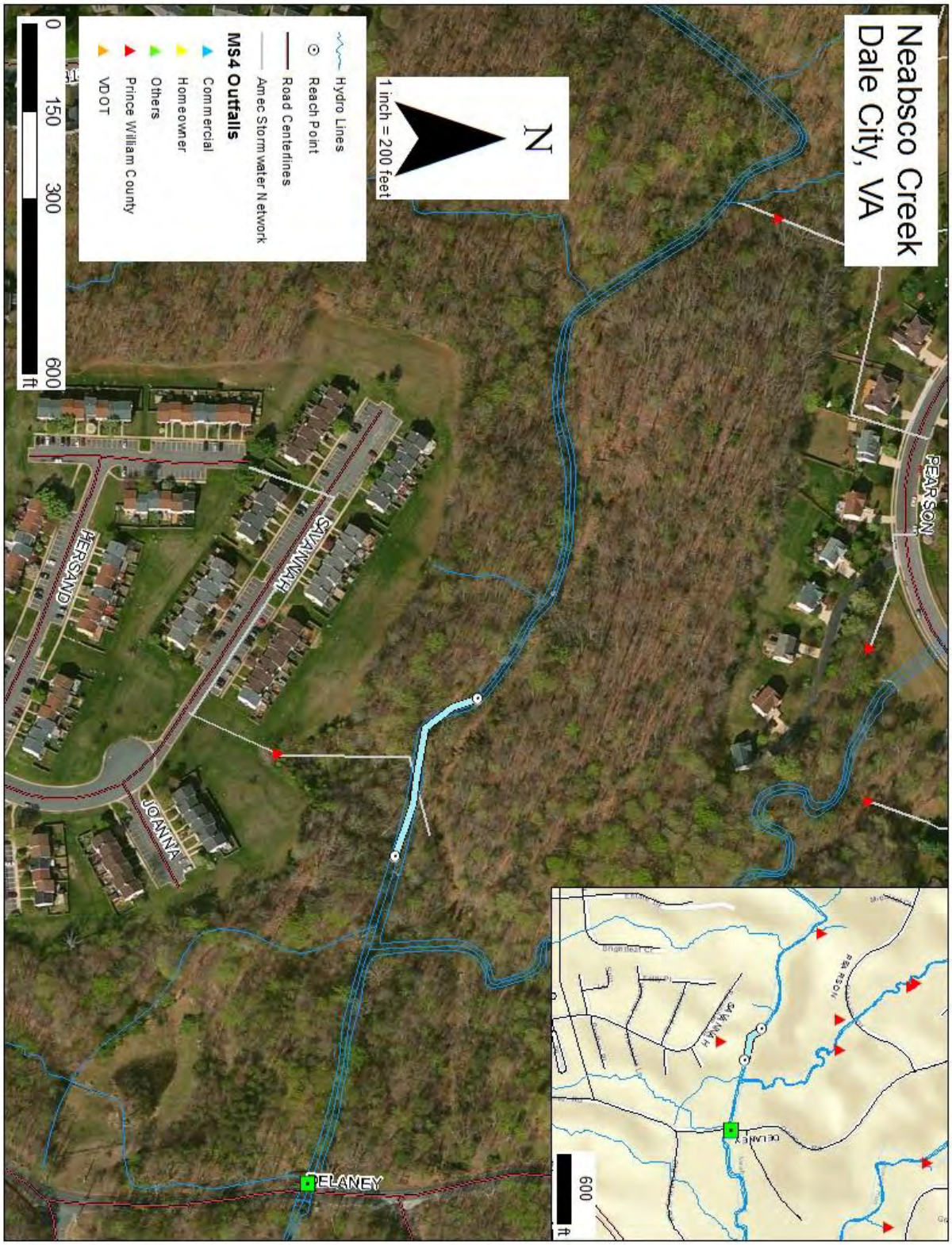
Neabsco Creek
Dale City, VA
N
1 inch = 200 feet
Hydro Lines
Reach Point
Road Centerlines
Amec Stormwater Network
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
0
150
300
600
ft
PEARSON
SAVANNAH
PERSAND
JOANNA
DELANEY
600
ft

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Cow Branch
Woodbridge, VA
Hydro Lines
Reach Point
Road Centerlines
Amec Storm water Network
MS4 Outfalls
Commercial
Homeowner
Others
Prince William County
VDOT
Cow Branch, Mellott Rd
MELLOTT
CROSSFIELD
OBERLIN
IVY STONE
POTOMAC HEIGHTS
JEFFERSON DAVIS
OPITZ
CROSSFIELD
MELLOTT
N
1 inch = 200 feet
0
150
300
600
ft
600
ft

Appendix C: Site Photos

Little Bull Run

Figure 1: Backwater area created by sanitary sewer crossing. Sampling reach lies upstream.

Figure 2: Looking upstream at beginning of sampling reach along the riffle consisting of larger gravel, cobble, and bedrock.

Figure 3: Looking downstream near beginning of sampling reach along the riffle containing large gravel, cobble, and bedrock.

Dawkins Branch

Figure 4: Large woody debris downstream from sampling reach.

Figure 5: Looking upstream near beginning of sampling reach.

Figure 6: Upstream from initial sampling point.

Figure 7: Looking downstream towards Figure 6.

Figure 8: Construction contractor storage site adjacent to stream reach. Site was contributing noticeable amount of silt to stream.

Purcell Branch

Figure 9: Stream bank incision >6 feet (vertical instability) from bed. Photo was taken downstream from sampling reach.

Figure 10: Upstream view of large pool filled with leaf pack. Photo was taken downstream of sampling reach.

Figure 11: Past leaf-packed pool, looking upstream towards initial sampling point.

Figure 12: Bank incision upstream of sampling reach. Suspected cause of incision is boulder creating flow redirection and backwater eddies, located behind photographer, impeding flow during high energy events.

Figure 13: Upstream view about 75 meters from initial sampling point.

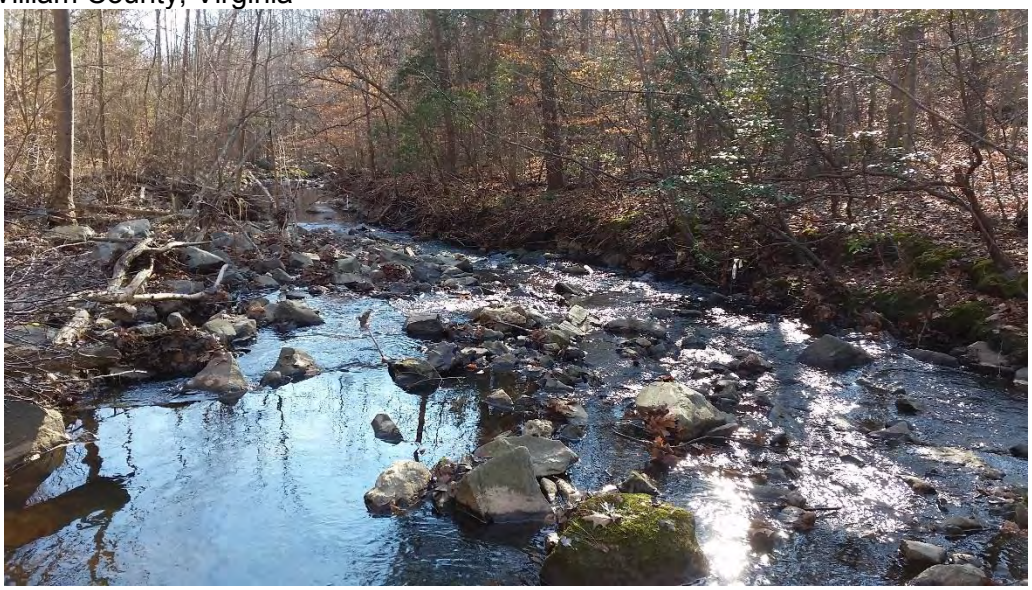

Figure 14: Looking downstream through sampling reach from approx. same location as Figure 13.

Cow Branch

Figure 15: Looking downstream from most recent bed and bank armoring. Sampling reach lies downstream from where photo location.

Figure 16: Technician standing at initial sampling point. Jefferson Davis Hwy. lies in the background.

Figure 17: Brief inspection of benthic macroinvertebrate habitat upstream from initial sampling point.

Sampling Plan
Benthic Macroinvertebrate Population and Water Quality Monitoring

Prepared for:

Prince William County Department of Public Works
Virginia

Prepared by:

Amec Foster Wheeler Environment & Infrastructure, Inc.
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(770) 421-3400

December 29, 2015

Project No. 151270003.0001

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APPENDICES

LIST OF ACRONYMS

Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
BI	Biotic Index
cm	Centimeter
COC	Chain of Custody
CWA	Clean Water Act
CFR	Code of Federal Regulations
DO	Dissolved Oxygen
E. coli	*Escherichia coli*
EPT	Ephemeroptera/Plecoptera/Tricoptera
GPS	Global Positioning System
m	Meter
µm	Micrometer
MS4	Municipal Separate Storm Sewer System
PMA	Percent Model Affinity
RBP	USEPA Rapid Bioassessment Protocol
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VSCI	Virginia Stream Condition Index
VSMP	Virginia Stormwater Management Program

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) has prepared this sampling plan for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Permit, Municipal Separate Storm Sewer System (MS4) Permit Number VA0088595, issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. Section I.C.1 of the permit requires the continued implementation of a biological stream monitoring program that includes an assessment of the habitat and benthic macroinvertebrate community of select Prince William County streams. This sampling plan provides detailed descriptions of the sampling and analytical activities, as well as a technical approach and methods to scientifically evaluate natural conditions in Prince William County streams.

1.1 BACKGROUND

The United States Environmental Protection Agency (USEPA) delegated the authority to implement Section 402 of the Clean Water Act (CWA) to the Commonwealth of Virginia on March 31, 1975. Subsequently, Section 62.1-44.15:25 of the Virginia Stormwater Management Act authorizes VDEQ to issue, deny, amend, revoke, terminate, and enforce permits for the control of stormwater discharges from MS4s. The VSMP Permit Number VA0088595 authorizes point source discharges of stormwater runoff and certain non-stormwater discharges from the MS4 operated or owned by Prince William County. Part I.C of the VSMP permit outlines the monitoring requirements guided by Section 9VAC25-870-380 C.2.c.(4) of the VSMP regulations.

1.2 PURPOSE AND OBJECTIVES

The purpose of this sampling plan is to outline a plan of study that will be used to comply with the biological stream (Part I.C.1) and in-stream monitoring (Part I.C.2) requirements outlined in Prince William County's permit. The specific objectives are to gather sufficient data to evaluate, and subsequently demonstrate, upstream best management practices effectiveness.

2.0 SITE BACKGROUND AND SETTING

A MS4 is a system of conveyances which may include roads with drainage systems, municipal streets, catch basins, ditches, gutters, curbs, man-made channels, or storm drains. It is designed to collect or convey stormwater. The Prince William County MS4 is composed of numerous sites throughout Prince William County and contains over 11,000 miles of stormwater conveyance structures. The Prince William County MS4 discharges stormwater into 24 6th order hydrologic units within 9 major watersheds of the Potomac River Basin.

Prince William County is 338 square miles in area and is bordered by the Potomac River to the east, Fairfax and Loudoun Counties to the north, Fauquier and Stafford Counties to the south, and Fauquier County to the west. The majority of Prince William County is located in the Piedmont Province with the remainder in the Atlantic Coastal Plain province. The Piedmont Province is an eastward sloping plateau characterized by moderate to very steep slopes. The Atlantic Coastal Plain province has primarily flat terrain with elevations ranging from sea level to about 300 feet. The Fall Line is a transitional area where the softer, less consolidated rocks of the Coastal Plain to the east intersect with harder and more resistant metamorphic rocks of the Piedmont to the west, forming an area of ridges, waterfalls and rapids. Land use surrounding the proposed sampling locations includes residential, undeveloped, commercial and recreational areas.

3.0 SAMPLING, ANALYSIS, AND REPORTING

This section describes the activities for the biological stream monitoring and in-stream monitoring required by Part I.C.1 and I.C.2 of VSMP MS4 Permit VA0088595.

3.1 SAMPLING LOCATIONS

Benthic macroinvertebrate and surface water samples will be collected from five locations in Prince William County (Appendix A).

- Little Bull Run, Catharpin Road, Gainesville, Virginia;
- Dawkins Branch, Wellington Road, Manassas, Virginia;
- Purcell Branch, Purcell Road, Manassas, Virginia;
- Neabsco Creek, Delaney Road, Dale City, Virginia;
- Cow Branch, Mellott Road, Woodbridge, Virginia.

Benthic macroinvertebrate sampling reaches will be 100 meters (m) long, ideally located 100 m upstream from road or bridge crossings, and have no major tributaries discharging to the reach. Sample locations will be verified using a handheld global positioning system (GPS) unit. The limits will marked in the field using survey stakes, pins, or an appropriate alternative for subsequent sampling events. Sample stations and their limits will be re-verified each sampling event using a handheld GPS and will be re-marked, if necessary.

3.2 SAMPLING AND FIELD DATA COLLECTION ACTIVITIES

Sampling and field data collection activities will include physical and chemical data collection, habitat assessment and benthic macroinvertebrate sampling. Sampling will be conducted following the requirements of VSMP MS4 Permit VA0088595 and procedures outlined in the USEPA Rapid Bioassessment Protocol (RBP) (Barbour et al. 1999).

3.2.1 Physical and Chemical Data Collection

Physical and chemical data collection includes collection of in-situ water quality readings, collection of surface water samples, and documentation of stream characteristics. The equipment needed for collection of these data includes a YSI Model 556 water quality meter (or equivalent), Lamotte 2020 turbidity meter (or equivalent), sample collection bottles, gloves, RBP Physical Characterization and Water Quality Field Data Sheets (Appendix B), a camera, a 100-m tape measure, and a flow meter (such as the Marsh-McBirney Flo-Mate). Field activities, measurements and observations will be recorded in indelible ink in a bound field logbook.

3.2.1.1 Water Quality

Water quality readings and surface water samples will be collected prior to disturbance of the sample reach. In-stream monitoring is required to be conducted at 5 stream sites for the following parameters per VSMP MS4 Permit VA0088595:

- pH,
- dissolved oxygen (DO),
- temperature,
- total suspended solids (TSS),
- ammonia as nitrogen,
- nitrate plus nitrite nitrogen,
- total Kjeldahl nitrogen (TKN),
- total nitrogen (calculation),
- dissolved phosphorus,
- total phosphorus, and
- *Escherichia (E.) coli.*

The RBP Physical Characterization and Water Quality Field Data Sheet (Appendix B) requires the measurement of pH, DO, and temperature as well as the following parameters in addition to those required by VSMP MS4 Permit VA0088595:

- conductivity or specific conductance, and
- turbidity.

In-situ water quality data will be collected using a multiprobe water quality meter (YSI Model 556 or equivalent) and a handheld turbidity meter (Lamotte 2020 or equivalent). The multiprobe will be calibrated daily using standard solutions. A calibration form is included in Appendix B. Multiprobe readings are taken mid-channel and the unit should be allowed to stabilize before recording readings.

Grab surface water samples to be collected for laboratory analysis of TSS, ammonia, nitrate/nitrite, total Kjeldahl nitrogen (TKN), dissolved phosphorus, total phosphorus, and *E. coli* should be collected at mid-channel at the zero mark of the reach in an area with cross-sectional homogeneity, and well mixed water. The samples will be placed in coolers on ice and shipped overnight under chain-of-custody (COC) procedures to a qualified laboratory licensed in the Commonwealth of Virginia. Custody seals will be employed to check for tampering during shipment. Samples will be analyzed in accordance with 1VAC30-45, Certification for Noncommercial Environmental Laboratories, or 1VAC30-46, Accreditation for Commercial

Environmental Laboratories. Methods used for sample analysis will be those approved by Title 40 Code of Federal (CFR) Regulations Part 136 or alternative methods approved by USEPA.

3.2.1.2 Stream Characteristics

Upstream and downstream photographs will be taken at each sampling location to document conditions at the time of sampling. Physical characteristics of the streams will be recorded on the Physical Characterization and Water Quality Field Data Sheet of the RBP (Appendix B). This field sheet includes a description of the sample location, weather conditions, stream characterization, watershed features (surrounding land use, non-point source pollution, erosion), riparian vegetation, instream features (high water mark, width, depth, morphology, velocity, canopy cover, channelization, and dams), large woody debris, aquatic vegetation, water quality, and substrate (odors, oils, deposits, components). The high water mark to be recorded on the form is defined as the vertical distance from the bankfull margin of the stream bank to the peak overflow level, as indicated by debris hanging in riparian or floodplain vegetation and deposition of silt or soil.

An estimate of large woody debris in contact with the stream water is recorded on the Physical Characterization and Water Quality Field Data Sheet (Appendix B). Each woody debris formation with a surface area in the plane of the water surface that is greater than 0.25 square m is recorded on the stream reach drawing with the size of the woody debris estimated to the nearest 0.5 m. Only the portion in contact with the water is measured. Woody debris with a length or width less than 0.5 m is not counted. Root wads and logs/limbs in the water margin that are in contact with the water are arbitrarily given a width of 0.5 m. The length and width of each formation are multiplied and the resulting products are summed to give the aquatic habitat area influenced. This area is divided by the water surface area within the reach to obtain the large woody debris density.

3.2.2 Habitat Assessment

Habitat characteristics will be assessed using the Habitat Assessment Field Data Sheet (Appendix B), as specified in the RBP. The habitat assessment is performed along the 100-m reach from which the biological sampling is to be conducted. Care will be taken not to disturb the benthic macroinvertebrate sampling habitat during the habitat assessment.

The Habitat Assessment Field Data Sheet (Appendix B) of the RBP will be completed at each location. There are high gradient stream and low gradient stream versions of this form. The high gradient form is used for streams located in moderate to high gradient landscapes with coarse substrates. The low gradient form is used for streams that are located in low to moderate

gradient landscapes and have fine substrates. The appropriate data form for each sampling location will be determined during the site reconnaissance.

The habitat assessment incorporates features of the entire sampling reach. The form rates ten parameters as optimal, suboptimal, marginal, or poor. The parameters to be rated include epifaunal substrate, embeddedness or pool substrate characterization, velocity/depth regime or pool variability, sediment deposition, channel flow status, channel alteration, riffle frequency or channel sinuosity, bank stability, bank vegetative protection, and riparian zone. The Habitat Assessment Field Data Sheet should be completed by a team of 2 or more qualified personnel that come to a consensus on determination of quality.

3.2.3 Benthic Macroinvertebrate Sample Collection

Biological stream monitoring will be conducted twice per year, spring and fall, at 5 locations (Appendix B). The collection of wildlife for scientific and/or educational purposes in Virginia requires a scientific collection permit. Permit applications are available from the Virginia Department of Game and Inland Fisheries (VDGIF) and should be submitted at least 1 month prior to benthic macroinvertebrate sample collection. The permit requires annual renewal and submittal of annual catch report. VDGIF requests to be notified seven days in advance of each sampling event.

The multiple habitat sampling method will be used to characterize the benthic macroinvertebrate community, as outlined in USEPA RBP Section 7.2. This method is used to collect benthic macroinvertebrates from various substrate types and micro-habitats available within a 100-m sampling reach. Sampling begins at the downstream end of the reach and proceeds upstream. Habitats will be sampled be using a 0.3-m wide, 500-micrometer (µm) mesh, D-frame dip net. A total of 20 jabs or kicks are taken from all major habitat types in the reach. A jab consists of forcefully thrusting the net into a productive habitat for a linear distance of 0.5 m. A kick is accomplished by positioning the net and disturbing the substrate for a distance of 0.5 m upstream of the net.

Different types of habitat are to be sampled in approximate proportion to their representation of surface area of total macroinvertebrate habitat in the reach. The habitats sampled typically consist of loose cobble, fallen logs and tree limbs (snags), vegetated banks or undercut banks with exposed plant root material, sand and silt bottom materials, and submerged macrophytes. Other habitats that may be sampled include bedrock, large rocks, boards and litter; and detrital pockets of twigs and leaves. The RBP Benthic Macroinvertebrate Field Data Sheet (Appendix B) will be completed for each sample. This form includes a summary of the percent of each

habitat type present, the number of jabs or kicks taken in each habitat type, and field observations of aquatic biota.

The jab or kick method varies with habitat type. Shallow areas with coarse substrates are sampled by holding the bottom of the dip net against the substrate and kicking the substrate upstream of the net. Submerged woody debris can be sampled by kicking while placing a net downstream, jabbing directly into medium-sized woody debris or by rinsing the woody debris directly into the sieve bucket. Sample submerged undercut banks by jabbing into the habitat. Bump or jab the net along the bottom of plants in the stream to sample rooted macrophytes. Sand and soft sediment can be sampled by bumping the net along the surface of the substrate.

The 20 jabs and kicks will be composited into a 0.5-µm mesh sieve bucket to obtain a single homogenous sample. The net will be thoroughly back-washed into the sieve bucket every few jabs to facilitate collection of benthic macroinvertebrates that are not readily visible. Large debris will be rinsed and removed from the sieve bucket. Observable benthic macroinvertebrates will be collected from the net with forceps and placed in a labeled, sample container. Small debris will be transferred from the sieve bucket to the sample container. An index card indicating the sample identification, date, stream name, sample location, and sampler name will be placed inside each sample container. The index card will be printed in pencil to prevent dissolution of the label by preservative which will be added by the analytical laboratory.

Benthic macroinvertebrate samples will be placed on ice in coolers and shipped overnight under COC procedures to an accredited benthic macroinvertebrate laboratory. Custody seals will be employed to check for tampering during shipment.

3.2.4 Field Duplicates

Duplicates are collected in the field for surface water analytical samples and benthic macroinvertebrate samples at a frequency of 1 per ten samples. Since there are five sample locations, duplicates will be collected every other sampling event at one sample location. Surface water duplicates will be collected by filling extra grab sample bottles for each analysis. The benthic macroinvertebrate duplicates will be collected from a sample location with habitat available for 2 sets of 20 jabs within the sample reach.

3.3 BENTHIC MACROINVERTEBRATE SAMPLE SORTING

The laboratory will sort, mount, identify, enumerate, evaluate, and classify benthic macroinvertebrates. In addition to sorting and identification of benthic macroinvertebrates, the laboratory staff will perform appropriate benthic macroinvertebrate index calculations and will perform and interpret statistical analyses of the benthic macroinvertebrate database. The

laboratory staff will also utilize the habitat descriptions and evaluations and the field physical/chemical water data parameters collected by field sampling personnel in the evaluation of benthic macroinvertebrates in the context of their physical/chemical habitats at the sampling location.

Samples should be logged in on a designated form or logbook such as the RBP Benthic Macroinvertebrate Sample Log-In Sheet (Appendix C). The login should contain the information from the sample label and the number of containers. A minimum of 200 ± 20 percent organisms will be sorted from each benthic macroinvertebrate sample, using the Caton subsampler (Caton 1991). This subsampler consists of square metal frame with a gridded mesh bottom (screen), a plastic tray that accommodates the frame, a square metal "cookie cutter" (cutter), and a metal scoop. The sample will be emptied onto the 500-µm mesh screen and washed to remove fixative and excess detritus. The sample and screen will then be placed into the tray and enough water added to cover the sample contents. The contents will be evenly distributed over the screen, which will then be lifted from the tray of water so the sample contents will settle onto the screen, which is divided into 6 centimeter (cm) by 6 cm portions (grids). After randomly-selecting four grids and locating them using an alphanumeric designation and crosspieces on the top of the screen, the contents of each grid will be removed using a scoop and a brush. A minimum of four grids will be used to obtain the specified number. If the four grids do not contain 200 ± 20 percent organisms, enough grids will be examined to acquire this number. If the four grids contain too many organisms, they will be emptied into a smaller subsampler of similar design, and four grids randomly chosen for sorting.

The contents from each grid will be transferred to a container, and enough water will be added to keep the organisms moist during the sorting process. The selected subsample will then be taken to the sorting station. Small aliquots of sample will be put into a gridded Petri dish, and the organisms removed, counted and placed into patent lip vials containing 70 percent ethanol by major group (e.g., Trichoptera, Ephemeroptera, Bivalvia, etc.). Vials will be labeled with site, date, major group, number of individuals, and size of subsample. The RBP Benthic Macroinvertebrate Laboratory Bench Sheet (Appendix C) should be completed. The sorted and unsorted portions of the sample will be preserved separately using the original fixative.

Organisms will be identified to the generic/specific level, except for groups such as nematodes, and damaged or very small individuals. Organisms, except oligochaetes and chironomid larvae, will be identified using a stereomicroscope. Oligochaetes and chironomid larvae will be mounted on microscope slides using CMC mounting medium prior to identification using a compound microscope.

3.3.1 Quality Assurance/Quality Control Procedures

Subsequent to benthic macroinvertebrate sample sorting, the residue from a minimum of 10 percent of the samples will be rechecked to document that 95 percent of the total number of organisms has been removed. If there is an error of greater than 5 percent, then all of the samples completed by that particular sorter will be re-examined. The results from these checks will be recorded on the laboratory bench sheets (Appendix C) and will be presented with the other data in the report.

A voucher collection for Prince William County dataset, consisting of one to three specimens for each taxon will be prepared in accordance with the RBP. These slides will be labeled, kept separate from the remaining identifications, and noted on the laboratory bench sheets. A taxonomist not responsible from the original identifications should spot check samples according to the identifications on the bench sheet.

Data will be entered into a standardized Excel spreadsheet and double-checked for accuracy.

3.3.2 Benthic Macroinvertebrate Sample Results Evaluation

Metrics are biological attributes that represent elements of the structure and function of the bottom-dwelling macroinvertebrate assemblage. Metrics are specific measures of diversity, composition, and tolerance to pollution, and when combined into a multimetric index can integrate biological community characteristics and measure the overall response of the community to environmental stressors. Biological metrics include:

- **Taxa Richness –** The number of taxa reflects the health of the community through a measurement of the variety of taxa present. This measure generally increases with increasing water quality, habitat diversity, and/or habitat suitability.

- **Abundance –** The number of individual organisms found at each location. This measure can indicate whether an area is supporting a large, and when coupled with taxa richness, diverse community.

- **EPT Index (Ephemeroptera/Plecoptera/Tricoptera [mayflies/stoneflies/ caddisflies]) –** The EPT Index is the total number of distinct taxa within these three orders. This value summarizes taxa richness within the insect orders that are generally considered to be the most sensitive to pollution.

- **EPT/EPT + Chironomidae (midgeflies) Ratio –** A measure of abundance ratio of these two groupings indicates the balance of the benthic community diversity.

- **Percent Dominant Taxon –** This measure is the percentage occurrence of the most dominant taxon for each location. This measure is based on the assumption that dominance by a single taxon reflects an impaired community.

- **Percent Chironomidae --** This measure is the ratio of the abundance of Chironomidae to the total number of organisms found in a replicate. The response of this measure is to increase with increased perturbation.
- **Biotic Index (BI) –** The BI assigns tolerance values to individual taxa ranging from 0 to 10, with 0 being intolerant of pollution and 10 being very tolerant of pollution. The tolerance values assigned to the various taxa are taken from a variety of sources that best reflect the area sampled, such as Bode et al. (2002), Klemm et al. (1990), Hilsenhoff (1987), North Carolina Department of Environment, Health, and Natural Resources (2003), and the Tennessee Department of Environment and Conservation (2011). The formula for calculating the BI is:

  $BI = \sum [(tv)_i n_i / N]$
  where:
  $(tv)_i$ = the tolerance value of the i^{th} taxon,
  n_i = the abundance of the i^{th} taxon, and
  N = the total number of individuals in the sample.

- **Percent Model Affinity (PMA) –** The PMA expresses the sample as the percentage composition of seven major organism groups (Chironomidae, Trichoptera, Ephemeroptera, Plecoptera, Coleoptera [beetles], Oligochaeta [aquatic segmented worms], and others) and compares it to an ideal community composition derived from data from unpolluted streams (Bode et al., 2002). The degree of affinity of the sample percentage composition with that of the ideal is used to make a judgment about the water quality of the stream being studied.

Additional biological metrics will be used, if appropriate, such as:

- percentage oligochaetes + chironomids,
- percentage scrapers/scrapers + filterers,
- percentage clingers
- percentage EPT,
- percentage Oligochaeta,
- percentage Hydropsychidae/Trichoptera, and
- number of taxa in each tolerance category.

VDEQ has developed the Virginia Stream Condition Index (VSCI) (TetraTech 2003) that predicts the health of Virginia's non-coastal streams. The VSCI uses biological, physical, and chemical conditions from a least disturbed reference site within the region and has been statistically calibrated by VDEQ data. Eight VSCI metrics are combined in a multimetric approach to identify biological impairment as discussed in the VDEQ 2008 Quality Assurance Project Plan (VDEQ 2008). The eight biological measures used in the VSCI are: total taxa, EPT taxa, percent Ephemeroptera, percent Plecoptera-Trichoptera less Hydropsychidae, percent scrapers, percent Chironomidae, percent top 2 dominant taxa, and biotic index. Prince William County benthic macroinvertebrate samples will be evaluated using the VSCI.

3.3 REPORTING

An annual summary report will be prepared following each year of sampling. This report will summarize the macroinvertebrate and in-stream monitoring results and analyses, and include an interpretation of the data with respect to long-term patterns and trends. Initial or first year results from sampling and analysis will serve as a benchmark at each station for subsequent sampling events, and for comparative analysis performed on a station-by-station basis. Report appendices will include data and documentation from that year of sampling events.

4.0 REFERENCES

Barbour, M. T., J. Gerritsen, B. D.Snyder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish. 2nd ed. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Bode, R. W., M. A. Novak, L. E. Abele, D. L. Heitzman, and A. J. Smith. 2002. Quality Assurance Work Plan for Biological Stream Monitoring in New York State. NYS Dept. Environ. Conserv., Division of Water Albany. 115 pp.

Caton, L. W. 1991. Improved Subsampling Methods for the EPA “Rapid Bioassessment” Benthic Protocols. Bull. N. Amer. Benthological Soc. 8: 317-319.

Hilsenhoff, W. L., 1987. An Improved Biotic Index of Organic Stream Pollution. The Great Lakes Entomologist. 20:31-39.

Klemm, D. J., P. A. Lewis, F. Fulk, and J. M. Lazorchak, 1990. Macroinvertebrate Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters. EPA/600/4-90/030. U.S. Environmental Protection Agency, Cincinnati. 256 pp.

North Carolina Department of Environment, Health, and Natural Resources. 2003. Standard Operating Procedures for Benthic Invertebrates. NCDENR Biological Assessment Unit.

Tennessee Department of Environment and Conservation. 2011. Division of Water Pollution Control. Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys.

TetraTech, 2003. A Stream Condition Index for Virginia Non-Coastal Streams. Owings Mill, MD. September 2003.

Virginia Department of Environmental Quality, 2008. Biological Monitoring Program Quality Assurance Project Plan for Wadeable Streams and Rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, VA. August 2008.

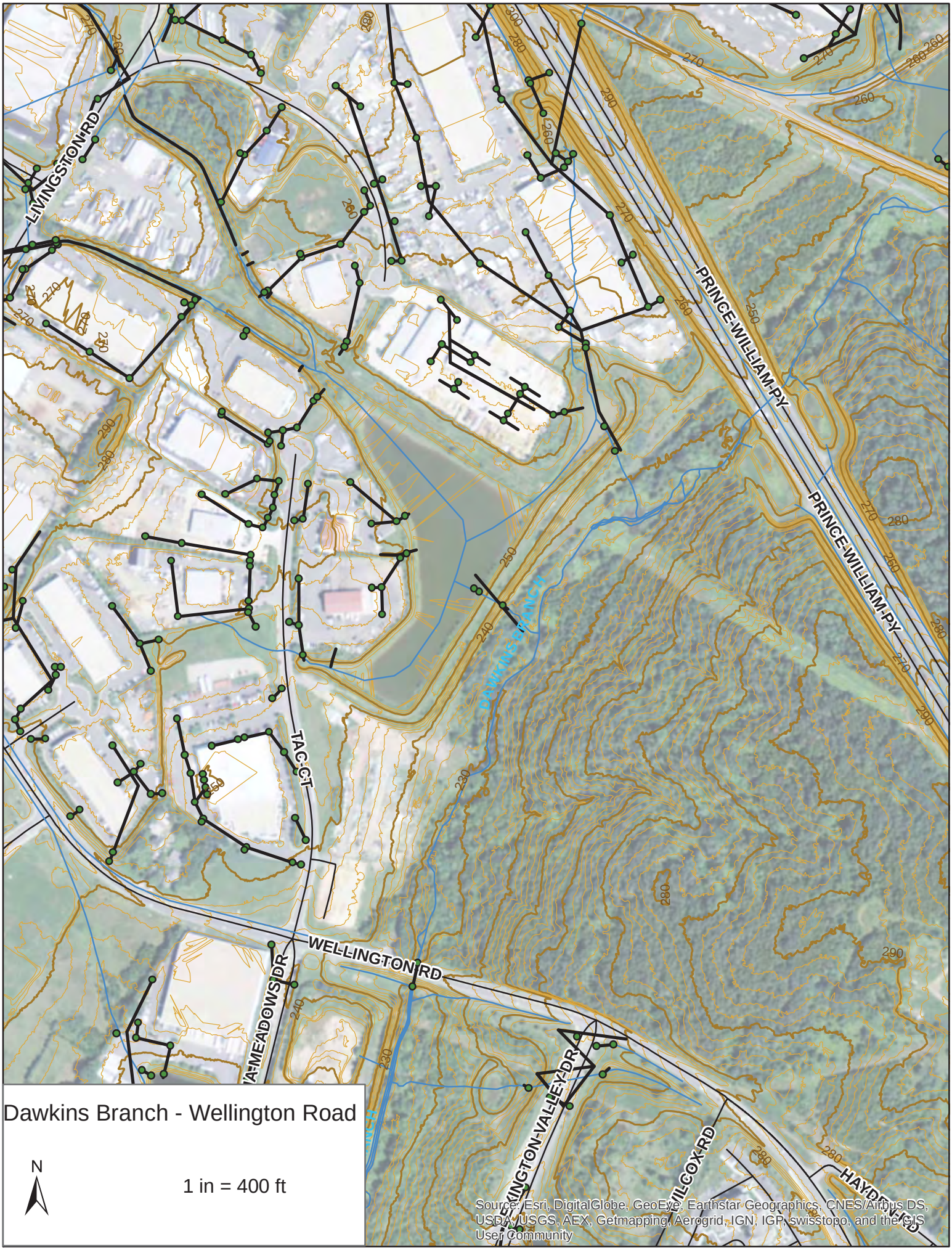
APPENDIX A

SAMPLING STATIONS


SNICKERSVILLE DR
LITTLE BULL RUN
LITTLE BULL RUN
EMMANUEL CT
HUNTERS RUN WY
RODERICK LP
CATHARPIN RD
CARTERWOOD DR
TOWN COMMONS WAY
Little Bull Run - Catharpin Road
N
1 in = 200 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


Little Bull Run - Catharpin Road
N
1 in = 400 ft
LITTLE BULL RUN
CAMDENHURST DR
SHERINGHAM WY
DANEHURST CL
SELBOURNE LN
ELDERMIELL LN
SKIPTON WY
HEATHCOTE BL
WITTON CL
NEWBERN LP
LEGEND DR
HUNTERS RUN WY
EMMANUEL CT
FALLSMERE CL
INNESFREE WY
SUTTON OAKS WY
CATHARPIN RD
DEBHILL LN
SNICKERSVILLE DR
KANAWHA WY
CHELMSFORD DR
STREET CRY CT
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


TAC CT
WELLINGTON RD
DAWKINS BRANCH
DAWKINS BRANCH
DAWKINS BRANCH
S DR
250
250
260
240
250
230
270
270
250
280
240
240
240
230
260
Dawkins Branch - Wellington Road
N
1 in = 200 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


LIVINGSTON RD
PRINCE WILLIAM PY
PRINCE WILLIAM PY
DAWKINS BRANCH
TAC CT
WELLINGTON RD
A MEADOWS DR
WELLINGTON VALLEY DR
IL COX RD
HAYDEN LN
Dawkins Branch - Wellington Road
N
1 in = 400 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

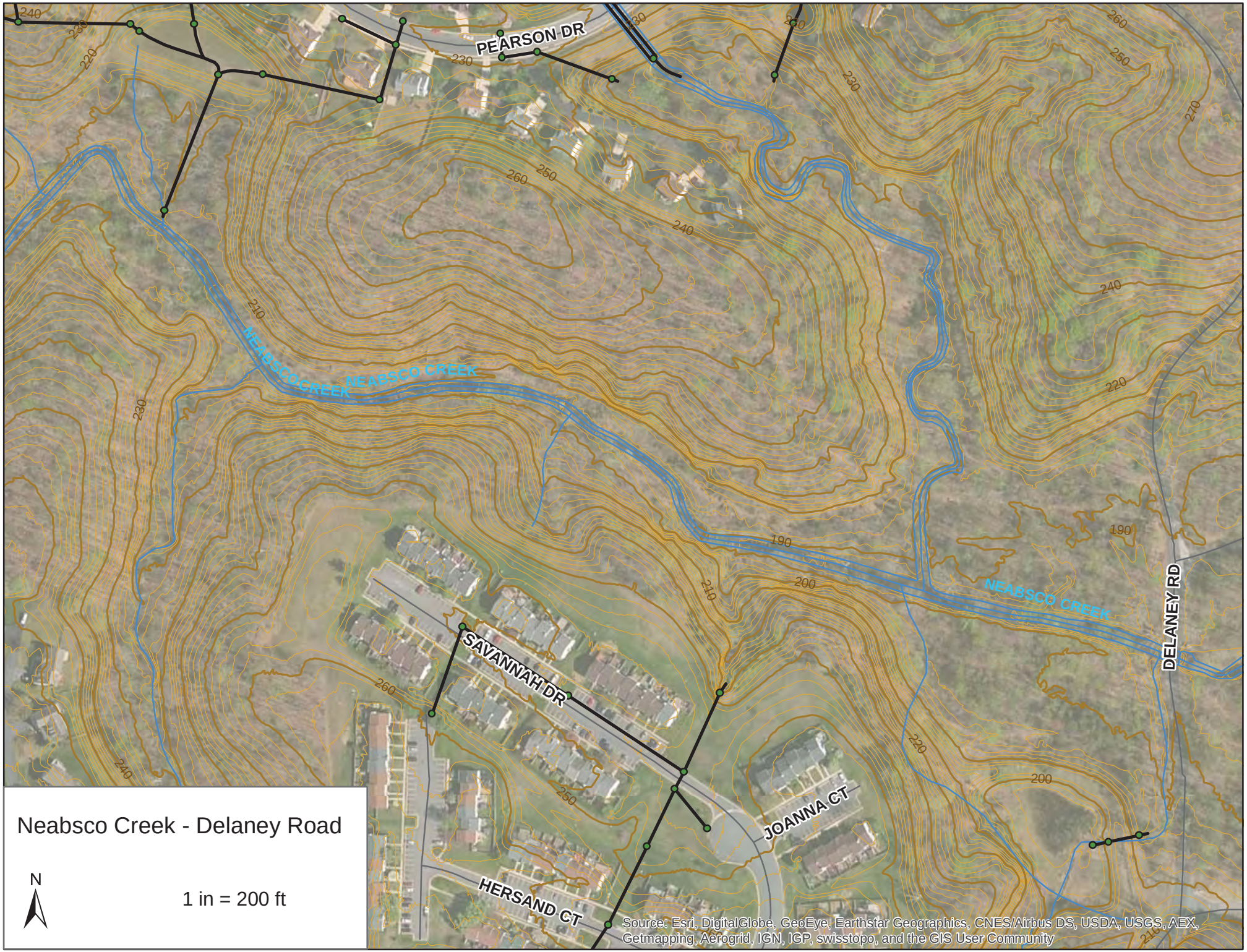
Purcell Branch - Purcell Road

N

1 in = 200 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


FALLING CREEK DR
FERN OAK CT
PURCELL BRANCH CT
ROCKY BROOKE CT
PURCELL RD
VISTA BROOKE DR
PURCELL BRANCH
GLADE CT
GRAY FOX TL
WHITE EAGLE DR
SILO MILL CT
PURCELL BRANCH
VISIONARY CT
UNBRIDLED CT
BRIDLE POST PL
PURCELL BRANCH
Purcell Branch - Purcell Road
N
1 in = 400 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


PEARSON DR
NEABSCO CREEK
NEABSCO CREEK
NEABSCO CREEK
SAVANNAH DR
JOANNA CT
HERSAND CT
DELANEY RD
Neabsco Creek - Delaney Road
N
1 in = 200 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


LAMBSGATE LN
LYNWOOD DR
LOGAN CT
LYNWAY CT
NEABSCO CREEK
NEABSCO CREEK
NEABSCO CREEK
NEABSCO CREEK
JOANNA CT
HERSAND CT
WHITELY CT
HEDRICK LN
HERCULES LN
DELANEY RD
STILL PL
PRATHER PL
MANOR HOUSE CT
BEL AIR PLANTATION RD
MINNIEVILLE RD
MINNIEVILLE RD
SAVANNAH DR
WHITAKER PL
ACCO WY
ESTATE DR
REGIMENT CT
Neabsco Creek - Delaney Road
N
1 in = 400 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


OPITZ BL
OPITZ BL
MALLOY CT
MASON CREEK CL
DANIEL STUART SQ
GREYWING ST
POTOMAC BRANCH DR
CROSSFIELD WY
OBERLIN DR
MELLOTT RD
JEFFERSON DAVIS HY
Cow Branch - Mellott Road
N
1 in = 200 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


OPITZ BL
OPITZ BL
REDDY DR
MALLOY CT
MASON CREEK CL
DANIEL STUART SQ
JEFFERSON DAVIS HY
BUILDAMERICA DR
POTOMAC CENTER BL
BROOKMOOR LN
CARTHAGE DR
OBERLIN DR
GREYWING ST
POTOMAC BRANCH DR
CROSSFIELD WY
IVYSTONE PL
EASTBOURNE DR
MELLOTT RD
WINDING LP
MARYLAND AV
PARTREE CT
DELAWARE DR
POTOMAC HEIGHTS PL
ENTERPRISE LN
HORIZON CT
SEQUOIA CT
Cow Branch - Mellott Road
N
1 in = 400 ft
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

APPENDIX B

FIELD FORMS

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE _____ TIME_____ AM PM	REASON FOR SURVEY

WEATHER CONDITIONS

Now		Past 24 hours
❑	storm (heavy rain)	❑
❑	rain (steady rain)	❑
❑	showers (intermittent)	❑
____%❑	%cloud cover	❑____%
❑	clear/sunny	❑

Has there been a heavy rain in the last 7 days? ❑ Yes ❑ No

Air Temperature_____^{0} C

Other_____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION

Stream Subsystem
❑ Perennial ❑ Intermittent ❑ Tidal

Stream Type
❑ Coldwater ❑ Warmwater

Stream Origin
❑ Glacial ❑ Spring-fed
❑ Non-glacial montane ❑ Mixture of origins
❑ Swamp and bog ❑ Other_____

Catchment Area_____km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
❑ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
❑ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
❑ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous

dominant species present _____

INSTREAM FEATURES

Estimated Reach Length _____m

Estimated Stream Width _____m

Sampling Reach Area _____m^2

Area in km^2 (m^2x1000) _____km^2

Estimated Stream Depth _____m

Surface Velocity (at thalweg) _____m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ❑ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle_____% ❑ Run_____%
❑ Pool_____%

Channelized ❑ Yes ❑ No

Dam Present ❑ Yes ❑ No

LARGE WOODY DEBRIS

LWD _____m^2

Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ❑ Attached Algae

dominant species present _____

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

Temperature_____° C

Specific Conductance_____

Dissolved Oxygen _____

pH _____

Turbidity _____

WQ Instrument Used _____

Water Odors
❑ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other_____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
❑ None ❑ Other_____

Turbidity (if not measured)
❑ Clear ❑ Slightly turbid ❑ Turbid
❑ Opaque ❑ Stained ❑ Other_____

SEDIMENT/ SUBSTRATE

Odors
❑ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other_____

Oils
❑ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ❑ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score _____

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		LOT NUMBER
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Cobble_____% ❑ Snags_____% ❑ Vegetated Banks_____% ❑ Sand_____% ❑ Submerged Macrophytes_____% ❑ Other ( )_____%
SAMPLE COLLECTION	**Gear used** ❑ D-frame ❑ kick-net ❑ Other _____ **How were the samples collected?** ❑ wading ❑ from bank ❑ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ❑ Cobble_____ ❑ Snags_____ ❑ Vegetated Banks_____ ❑ Sand_____ ❑ Submerged Macrophytes_____ ❑ Other ( )_____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

YSI Calibration Form

Project:_____
Date:_____
Pre-Calibration Time (24-hr Clock):_____
Post-Calibration Time (24-hr Clock):_____

Pine Sonde ID No.: _____
Pine Handset ID No.: _____
Battery Voltage (%): _____

Prior to Operation - Check the Following Items:

- ☐ Ensure Equipment is Operable Prior to Mobilization - Checked By _____
- ☐ Attach Carabiner to Sonde
- ☐ Attach Safety Line (Non-Wadeable Conditions) ☐ NA (Wadeable Conditions)
- ☐ Check Batteries/Back-Up Batteries

amec foster wheeler

User Tips:

Keep the handset and sonde in the shade when not in use (i.e., cooler, bucket, bin).
Keep the sensors damp between readings, check the sponge to ensure adequate moisture.
Do not keep the slotted cover on the sonde between readings or sites, or during mobilization.
If the calibration is "outside of range", call Pine Environmental at (770) 925-2855 or (800) 842-1088 for assistance, or for instructions to reset the default calibration settings.

		Pre-Calibration	Post-Calibration
DISSOLVED OXYGEN (DO)			
Was DO membrane changed? Yes, Time/Date:_____ ☐ No ☐ NA (optical sensor)			
Current Air Temperature ºC (meter reading):			
Current Barometric Pressure (from Weather Channel or NOAA.gov, which is corrected to sea level):	☐ NA (YSI includes barometer)		
Elevation Corrected Barometric Pressure to enter into YSI DO calibration (or YSI barometer reading if available):	Ex.: 30.02 in. Hg x 25.4 = mm Hg; **subtract** 2.54 mm Hg for every 100 ft. above sea level: 565/100 x 2.54 = 14.4 mm Hg Elevation: Calvert, AL is 50 ft, and Athens, GA site is 700 ft.		
DO concentration before Calibration (mg/L):			
DO concentration after Calibration (mg/L):			
CONDUCTIVITY [Note: Calibrate before pH]			
Temperature (ºC)			
Reading before Calibration (mS/cm^{C})			
Reading AFTER Calibration (mS/cm^{C})			
pH			
pH **7.0** value before calibration:			
pH **7.0** value after calibration:			
pH **7.0** mV **(range is -50 to +50 mV)**:			
pH **10.0** value before calibration:			
pH **10.0** value after calibration:			
pH **10.0** mV **(range is -130 to -230 mV)**:			
pH **4.0** value before calibration:			
pH **4.0** value after calibration:			
pH **4.0** mV **(range is 130 to 230 mV)**:			
OXIDATION/REDUCTION POTENTIAL (ORP)			
Calibration Temperature (ºC):			
Reading before calibration (mV):			
Reading after calibration (mV):			
TURBIDITY			
0 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		
1 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		
10 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		
126 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		

Pre-Calibrated By:_____

Post-Calibrated By:_____

Checked by:_____

APPENDIX C

LABORATORY FORMS

page __ of __

BENTHIC MACROINVERTEBRATE SAMPLE LOG-IN SHEET

Date Collected	Collected By	Number of Containers	Preservation	Station #	Stream Name and Location	Date Received by Lab	Lot Number	Date of Completion		
								sorting	mounting	identification

Serial Code Example: B0754001(1)
B = Benthos (F = Fish; P = Periphyton) ■ 0754 = project number ■ 001 = sample number ■ (1) = lot number (e.g., winter 1996 =1; summer 1996 = 2)

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BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page ____ of ____

STREAM NAME	LOCATION
STATION #_____ RIVERMILE_____	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN
STORET #	AGENCY
COLLECTED BY DATE_____	LOT #
TAXONOMIST DATE_____	SUBSAMPLE TARGET ❑ 100 ❑ 200 ❑ 300 ❑ Other ____

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta						Megaloptera					
Hirudinea						Coleoptera					
Isopoda											
Amphipoda						Diptera					
Decapoda											
Ephemeroptera											
						Gastropoda					
						Pelecypoda					
Plecoptera											
						Other					
Trichoptera											
Hemiptera											

Taxonomic certainty rating (TCR) 1-5:1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms _____ **Total No. Taxa** _____

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (BACK)

SUBSAMPLING/SORTING INFORMATION

Sorter _____

Date _____

Number of grids picked: _____

Time expenditure _____ No. of organisms _____

Indicate the presence of large or obviously abundant organisms:

QC: ❑ YES ❑ NO **QC Checker** _____

# organisms originally sorted		# organisms recovered by checker		# organisms originally sorted		% sorting efficiency
	÷ (		+		) =	

≥90%, sample passes _____

<90%, sample fails, action taken _____

TAXONOMY

ID _____

Date _____

Explain TCR ratings of 3-5:

Other Comments (e.g. condition of specimens):

QC: ❑ YES ❑ NO **QC Checker** _____

Organism recognition ❑ pass ❑ fail

Verification complete ❑ YES ❑ NO

General Comments (use this space to add additional comments):

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE _____ TIME_____ AM PM	REASON FOR SURVEY

WEATHER CONDITIONS

Now		Past 24 hours
❑	storm (heavy rain)	❑
❑	rain (steady rain)	❑
❑	showers (intermittent)	❑
____%❑	%cloud cover	❑____%
❑	clear/sunny	❑

Has there been a heavy rain in the last 7 days? ❑ Yes ❑ No

Air Temperature_____^{0} C

Other_____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION

Stream Subsystem
❑ Perennial ❑ Intermittent ❑ Tidal

Stream Type
❑ Coldwater ❑ Warmwater

Stream Origin
❑ Glacial ❑ Spring-fed
❑ Non-glacial montane ❑ Mixture of origins
❑ Swamp and bog ❑ Other_____

Catchment Area_____km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
❑ Forest ❑ Commercial
❑ Field/Pasture ❑ Industrial
❑ Agricultural ❑ Other _____
❑ Residential

Local Watershed NPS Pollution
❑ No evidence ❑ Some potential sources
❑ Obvious sources

Local Watershed Erosion
❑ None ❑ Moderate ❑ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
❑ Trees ❑ Shrubs ❑ Grasses ❑ Herbaceous

dominant species present _____

INSTREAM FEATURES

Estimated Reach Length _____m

Estimated Stream Width _____m

Sampling Reach Area _____m^2

Area in km^2 (m^2x1000) _____km^2

Estimated Stream Depth _____m

Surface Velocity (at thalweg) _____m/sec

Canopy Cover
❑ Partly open ❑ Partly shaded ❑ Shaded

High Water Mark _____m

Proportion of Reach Represented by Stream Morphology Types
❑ Riffle_____% ❑ Run_____%
❑ Pool_____%

Channelized ❑ Yes ❑ No

Dam Present ❑ Yes ❑ No

LARGE WOODY DEBRIS

LWD _____m^2

Density of LWD _____m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
❑ Rooted emergent ❑ Rooted submergent ❑ Rooted floating ❑ Free floating
❑ Floating Algae ❑ Attached Algae

dominant species present _____

Portion of the reach with aquatic vegetation _____%

WATER QUALITY

Temperature_____° C

Specific Conductance_____

Dissolved Oxygen _____

pH _____

Turbidity _____

WQ Instrument Used _____

Water Odors
❑ Normal/None ❑ Sewage
❑ Petroleum ❑ Chemical
❑ Fishy ❑ Other_____

Water Surface Oils
❑ Slick ❑ Sheen ❑ Globs ❑ Flecks
❑ None ❑ Other_____

Turbidity (if not measured)
❑ Clear ❑ Slightly turbid ❑ Turbid
❑ Opaque ❑ Stained ❑ Other_____

SEDIMENT/ SUBSTRATE

Odors
❑ Normal ❑ Sewage ❑ Petroleum
❑ Chemical ❑ Anaerobic ❑ None
❑ Other_____

Oils
❑ Absent ❑ Slight ❑ Moderate ❑ Profuse

Deposits
❑ Sludge ❑ Sawdust ❑ Paper fiber ❑ Sand
❑ Relict shells ❑ Other_____

Looking at stones which are not deeply embedded, are the undersides black in color?
❑ Yes ❑ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score _____

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE ___ (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE ___ (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS		LOT NUMBER
FORM COMPLETED BY	DATE _____ TIME _____ AM PM	REASON FOR SURVEY

HABITAT TYPES	**Indicate the percentage of each habitat type present** ❑ Cobble_____% ❑ Snags_____% ❑ Vegetated Banks_____% ❑ Sand_____% ❑ Submerged Macrophytes_____% ❑ Other ( )_____%
SAMPLE COLLECTION	**Gear used** ❑ D-frame ❑ kick-net ❑ Other _____ **How were the samples collected?** ❑ wading ❑ from bank ❑ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ❑ Cobble_____ ❑ Snags_____ ❑ Vegetated Banks_____ ❑ Sand_____ ❑ Submerged Macrophytes_____ ❑ Other ( )_____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

YSI Calibration Form

Project:_____
Date:_____
Pre-Calibration Time (24-hr Clock):_____
Post-Calibration Time (24-hr Clock):_____

Pine Sonde ID No.: _____
Pine Handset ID No.: _____
Battery Voltage (%): _____

Prior to Operation - Check the Following Items:

- ☐ Ensure Equipment is Operable Prior to Mobilization - Checked By _____
- ☐ Attach Carabiner to Sonde
- ☐ Attach Safety Line (Non-Wadeable Conditions) ☐ NA (Wadeable Conditions)
- ☐ Check Batteries/Back-Up Batteries

amec foster wheeler

User Tips:

Keep the handset and sonde in the shade when not in use (i.e., cooler, bucket, bin).
Keep the sensors damp between readings, check the sponge to ensure adequate moisture.
Do not keep the slotted cover on the sonde between readings or sites, or during mobilization.
If the calibration is "outside of range", call Pine Environmental at (770) 925-2855 or (800) 842-1088 for assistance, or for instructions to reset the default calibration settings.

		Pre-Calibration	Post-Calibration
DISSOLVED OXYGEN (DO)			
Was DO membrane changed? Yes, Time/Date:_____ ☐ No ☐ NA (optical sensor)			
Current Air Temperature ºC (meter reading):			
Current Barometric Pressure (from Weather Channel or NOAA.gov, which is corrected to sea level):	☐ NA (YSI includes barometer)		
Elevation Corrected Barometric Pressure to enter into YSI DO calibration (or YSI barometer reading if available):	Ex.: 30.02 in. Hg x 25.4 = mm Hg; **subtract** 2.54 mm Hg for every 100 ft. above sea level: 565/100 x 2.54 = 14.4 mm Hg Elevation: Calvert, AL is 50 ft, and Athens, GA site is 700 ft.		
DO concentration before Calibration (mg/L):			
DO concentration after Calibration (mg/L):			
CONDUCTIVITY [Note: Calibrate before pH]			
Temperature (ºC)			
Reading before Calibration (mS/cm^{C})			
Reading AFTER Calibration (mS/cm^{C})			
pH			
pH **7.0** value before calibration:			
pH **7.0** value after calibration:			
pH **7.0** mV **(range is -50 to +50 mV)**:			
pH **10.0** value before calibration:			
pH **10.0** value after calibration:			
pH **10.0** mV **(range is -130 to -230 mV)**:			
pH **4.0** value before calibration:			
pH **4.0** value after calibration:			
pH **4.0** mV **(range is 130 to 230 mV)**:			
OXIDATION/REDUCTION POTENTIAL (ORP)			
Calibration Temperature (ºC):			
Reading before calibration (mV):			
Reading after calibration (mV):			
TURBIDITY			
0 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		
1 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		
10 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		
126 NTU Turbidity Standard	☐ NA (No Standard) Before Cal: After Cal:		

Pre-Calibrated By:_____

Post-Calibrated By:_____

Checked by:_____

page __ of __

BENTHIC MACROINVERTEBRATE SAMPLE LOG-IN SHEET

Date Collected	Collected By	Number of Containers	Preservation	Station #	Stream Name and Location	Date Received by Lab	Lot Number	Date of Completion		
								sorting	mounting	identification

Serial Code Example: B0754001(1)
B = Benthos (F = Fish; P = Periphyton) ■ 0754 = project number ■ 001 = sample number ■ (1) = lot number (e.g., winter 1996 =1; summer 1996 = 2)

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BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page ____ of ____

STREAM NAME	LOCATION
STATION #_____ RIVERMILE_____	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN
STORET #	AGENCY
COLLECTED BY DATE_____	LOT #
TAXONOMIST DATE_____	SUBSAMPLE TARGET ❑ 100 ❑ 200 ❑ 300 ❑ Other ____

Enter Family and/or Genus and Species name on blank line.

Organisms		No.	LS	TI	TCR	Organisms		No.	LS	TI	TCR
Oligochaeta						Megaloptera					
Hirudinea						Coleoptera					
Isopoda											
Amphipoda						Diptera					
Decapoda											
Ephemeroptera											
						Gastropoda					
						Pelecypoda					
Plecoptera											
						Other					
Trichoptera											
Hemiptera											

Taxonomic certainty rating (TCR) 1-5:1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms _____ **Total No. Taxa** _____

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (BACK)

SUBSAMPLING/SORTING INFORMATION

Sorter _____

Date _____

Number of grids picked: _____

Time expenditure _____ No. of organisms _____

Indicate the presence of large or obviously abundant organisms:

QC: ❑ YES ❑ NO **QC Checker** _____

# organisms originally sorted		# organisms recovered by checker		# organisms originally sorted		% sorting efficiency
	÷ (		+		) =	

≥90%, sample passes _____

<90%, sample fails, action taken _____

TAXONOMY

ID _____

Date _____

Explain TCR ratings of 3-5:

Other Comments (e.g. condition of specimens):

QC: ❑ YES ❑ NO **QC Checker** _____

Organism recognition ❑ pass ❑ fail

Verification complete ❑ YES ❑ NO

General Comments (use this space to add additional comments):

Appendix 2 – In-Stream Monitoring

Appendix 3 – Floatables and Solids Monitoring

Floatble Monitoring 2017		2017							
Location	**Watershed**	**Name**	**Dates**	**Participants**	**Time**	**Total time**	**Pounds of Trash (lbs)**	**Distance Covered (ft)**	**Commments**
Phase 1									
Manassas Forge Drive	Lower Bull Run PL 46	Liberia Avenue Creek	2-4-2017	1	1.5	1.5	20	100	Dominant items collected were snack bags, plastic bags, plastic bottles, and styrofoam.
Cornice Place	Occoquan- PL 47	Hooes Run	02-11-2017	3	1	3	15	85	some items collected : rope, net, bag, slippers, **Payless bag, 3 Gaint bags, 1 Charles bag**
Dawkins Branch	Broad Run -34	Dawkins Branch	3-7-2017	2	2	4	35	60	The dominant items we found included snack wrappers, plastic bags, plastic bottles, pencils, straws, hair bows, balloons, socks, ziplock bags, and glue sticks just to name a few.
Andrew Leitch Park	Broad Run- PL 34	Neabsco Creek	3-21-2017	2	2	4	30	60	The dominant items we collected included glass bottles, wrappers, plastic bags, and plastic bottles. Some items were entangled within tree roots.
Phase 2									
Flat Branch	Bull Run- PL 44	Flat Branch	04/30/2017	8	2	16	70	70	plywoods and assorted trash, trash bags, plastic bottles, cloth, alluminum can
Manassas Forge Drive	Lower Bull Run PL 46	Liberia Avenue Creek	6-1-2017	2	1	2	25	100	Dog ball, car part, metal sheet , popsiicle stick, straws, toy gun, cloth, tic toc, milk jug, nug bun bullet, medication container,Plywood, ***Food Lion bag, *McDonald's cup , *Sweet**
Cornice Place	Occoquan- PL 47	Hooes Run	6-6-2017	3	1	3	5	85	Oil sheen, Candy-Chikliets, plastic cup, cigarate butts, metal hinge, handkerchief ***Five Guys Cup, * Sweet BBQ Becon Cup, *7/11 cup**
Phase 3									
Andrew Leitch Park	Broad Run- PL 34	Neabsco Creek	7/22/2017	**1**	**2**	**2**	80	60	Net, boards, gauze, scotch tape, metal rod, plastic, straw, mesh bag, pipe. 40 lbs. of trash ***Kings Dominion bags, *Global Foods bag**
Flat Branch	Bull Run- PL 44	Flat Branch	7-27-2017	7	2	14	25	70	Cloth, ball, cups, styrofoam pieces, plank

Dawkins Branch	Broad Run -34	Dawkins Branch	8/31/2017	**2**	**2**	**4**	**25**	**45**	Fork, stockings, toy car, dog toy, plastic tool, cardboard, plywood, paper, battery, elastic bands, cloth, straws, hair ribbons, headbands, classroom streamer, net, scarf, lid cups, glove, container, plastic rope, label for water balloons, yoyo, toy, juice box, pool frisbee, ***Duty Calls poop bags, *Wegmans grocery bag, *Ziploc bag, *Washington Post newspaper**

Floatables Monitoring Site Selection Data Sheets

The initial candidate Floatables Monitoring Program site locations were provided by PWCSWCD as part of their stream stewards program. These sites were first screened to include those who receive discharges from MS-4 Regulated Outfalls. Potential alternative sites are included as suggestions from PWC as additional sampling locations. These sites allow for a wider range of land uses to be included in the Floatables program analysis. Other sites will be considered upon discussion with stakeholders and County Staff if needed. These sites will be added at the end of this analysis document.

Maps are to be marked with important locations such as:

- Estimated Stream Stewards sampling location
- Ingress-egress for monitoring staff
- Potential sampling locations
- Trash hotspots
- Regulated outfall Locations
- Any dangerous or suspicious areas
- Other areas of interest

Scoring is determined by averaging the score from each individual scoring category. The score in each scoring category is selected from a scale of 1 to 5, with a score of 1 representing a least favored outcome, and a score of 5 representing a most desired outcome. If any qualifications are not met (i.e. a score of 0 is recorded for a site) then the site is disqualified from being used as a final site. The top 5 sites will be selected for the Floatables Monitoring Program.

Site 1: Bull Run, Ben Lomond Park

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

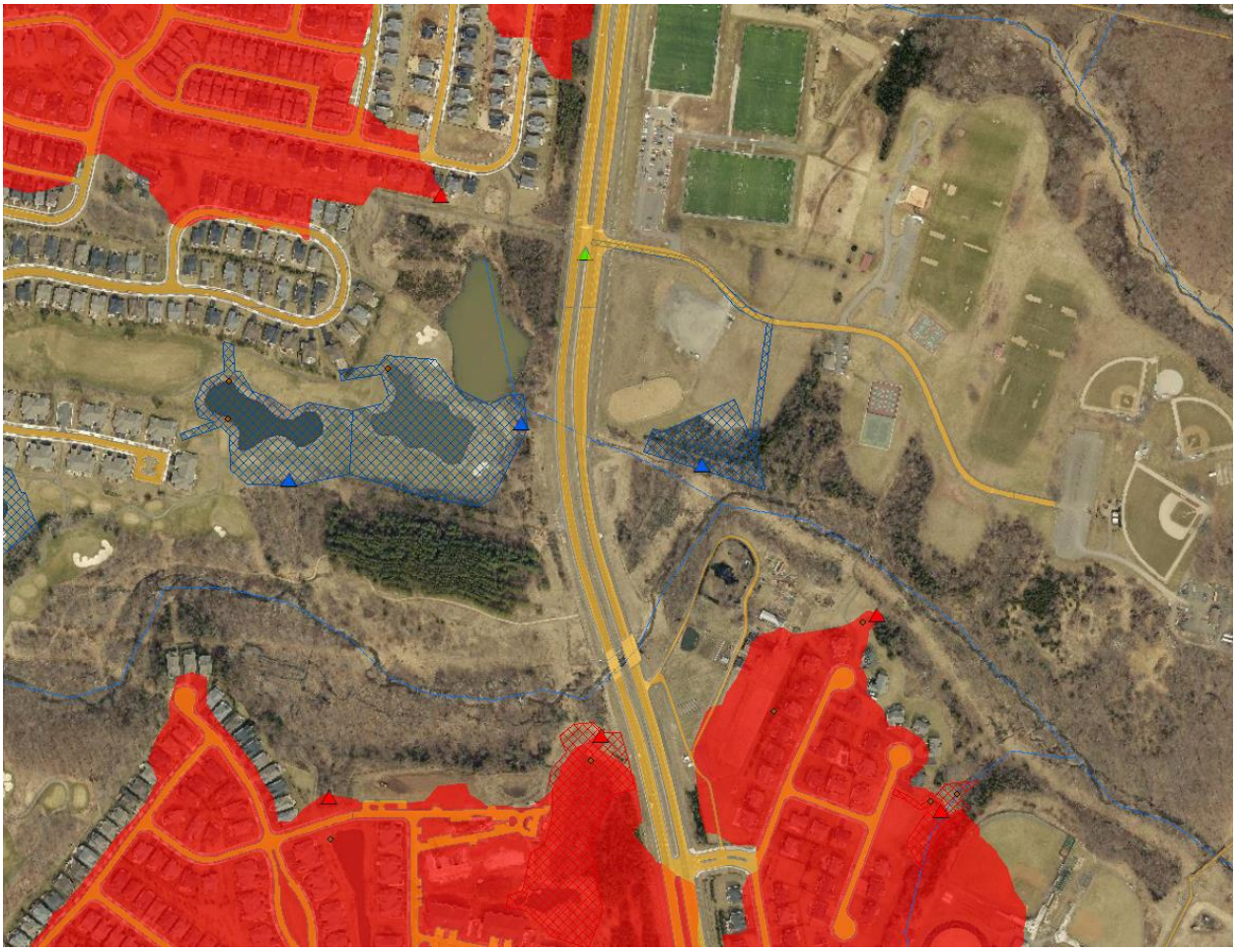
_____

_____

_____

Site Score: ____

Site 2: Catharpin Creek, James Long Park



Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 3: Dawkins Branch, Victory Elementary School

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

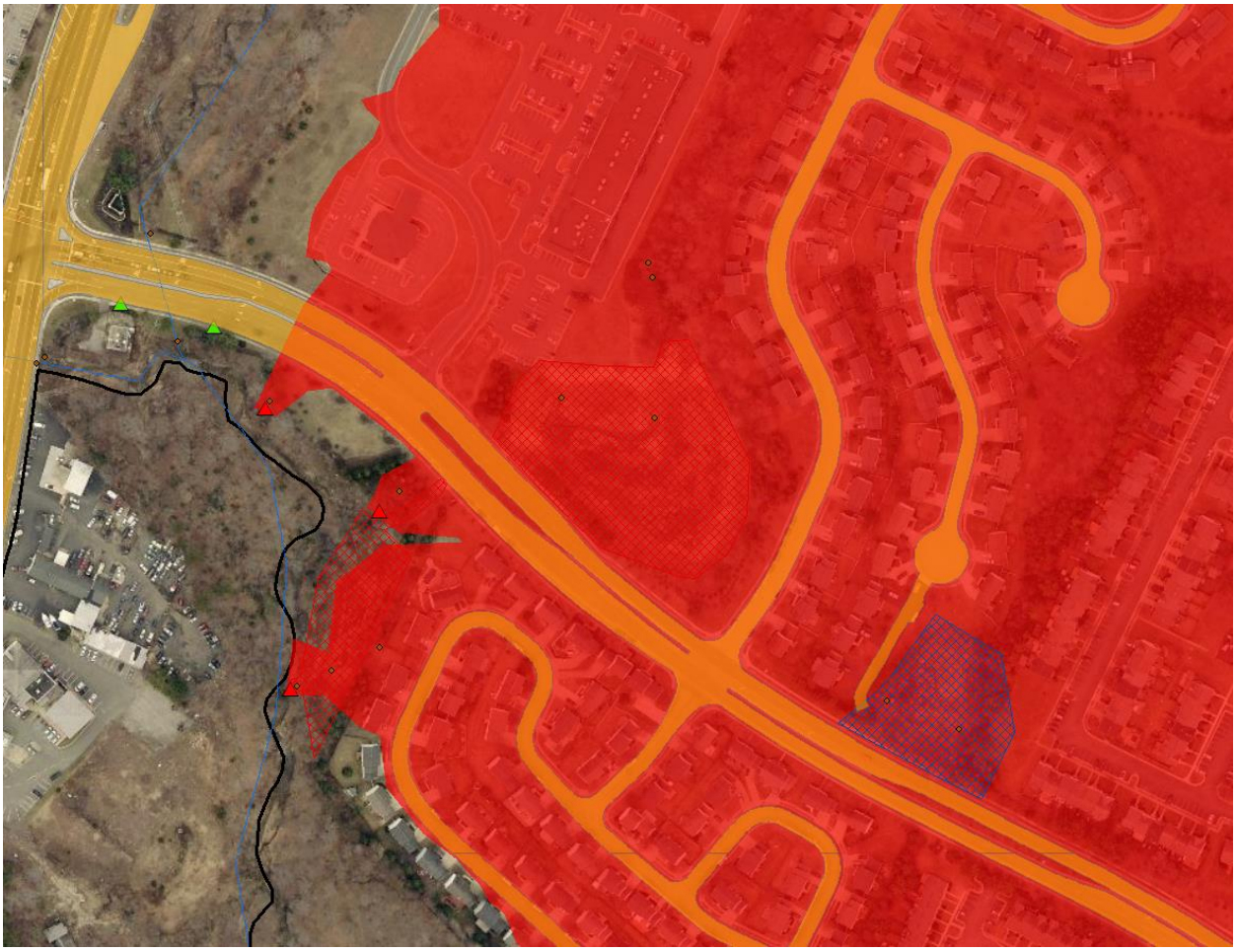
_____

_____

_____

Site Score: ____

Site 4: Dewey's Creek, Wayside Drive



Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 5: Hooes Run, Castile Court

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

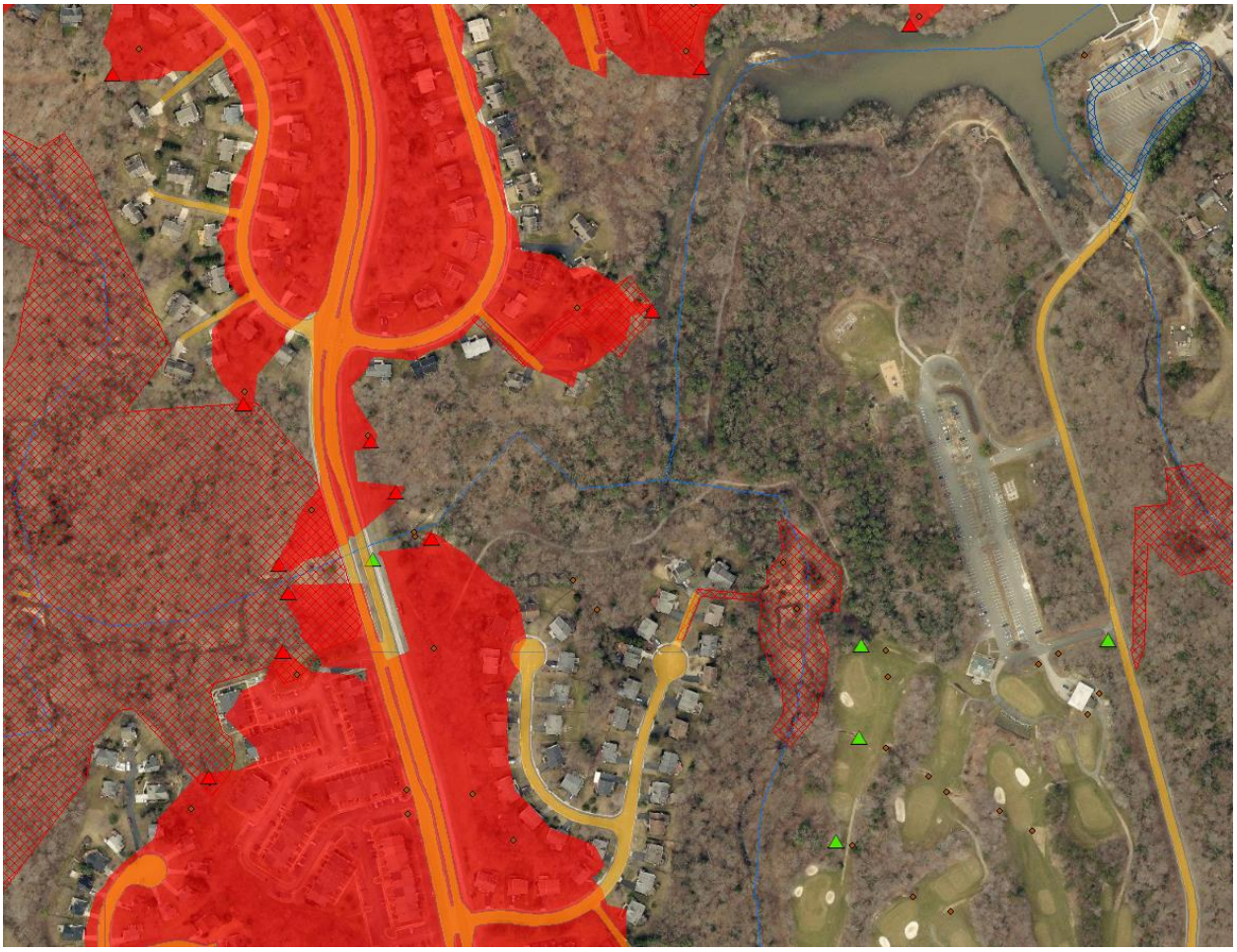
_____

_____

_____

Site Score: ____

Site 6: Hooes Run, Springwood Drive



Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 7: Neabsco Creek, Andrew Leitch Park

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 8: Neabsco Creek, Cloverdale Park

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 9: Powells Creek, Monclair

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 10:

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

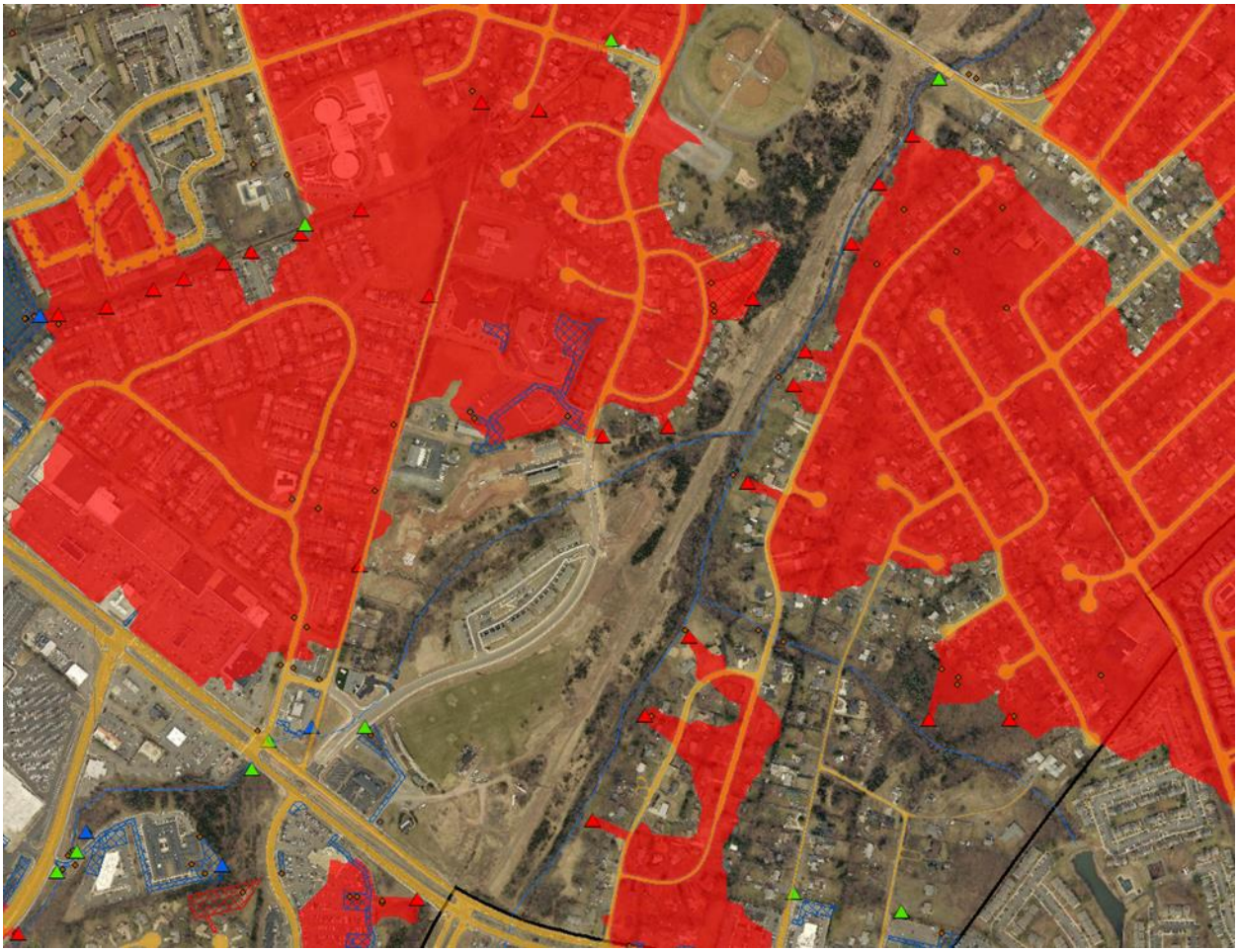
_____

_____

_____

Site Score: ____

Site 11:



Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Site 12:

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

_____

_____

Site Score: ____

Prince William County

Floatables Monitoring Program

Permit No.
VA0088595

Prince William County Department of Public Works
Watershed Management Branch
5 County Complex Court, Suite 170
Prince William, Virginia 22192

5/1/2016

Table of Contents

I. Introduction

Prince William County is dedicated to Program providing its citizens with the healthiest environment possible. It is with this goal the County establishes programs aimed at reducing pollutant impacts from heavily urbanized and industrialized areas. Non-point source pollution from urban and industrial areas within the County is a great concern due to its potential to impact water quality. Pollutants are transported from these areas during rain events and often deposited untreated into nearby streams and rivers. To mitigate this issue, the Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VA-DEQ) have instituted programs aimed at reducing the potential impact of pollutants from urban areas. Goes into

Under the Virginia Pollutant Discharge Elimination System Permit Program (VPDS) and Virginia Stormwater Management Program (VSMP) permits are issued aimed at reducing pollution runoff from industrial and urban areas containing Municipal Separate Storm Sewers Systems or MS-4s. These systems transport water from urbanized areas to streams and rivers and are a major concern of point and non-point source pollution. Discharges from MS4s are regulated under the Virginia Stormwater Management Act and Clean Water Act (CWA) through permits issued by DEQ and the EPA. Through this program, Prince William County maintains a Phase 1 VSMP MS-4 permit (Permit No. VA0088595).

Through its VSMP permit, the County is required to monitor floatables from areas suspected to be contributing excess levels of trash and refuse to its MS-4 by implementing a Floatables Monitoring Program. Unlike the Dry Weather Monitoring Program and Wet Weather Screening Program, the Floatables Monitoring Program is aimed at assessing trash loadings to streams. Using information obtained through this program, the County is to then develop strategies to reduce refuse load from these areas. The County's MS-4 permit, issued on December 17th, 2014, outlines requirements for the Floatables Monitoring Program as follows:

> **3. Floatables Solids Monitoring**
> No later than 24 months after the effective date of the permit, the permittee shall develop and implement a floatables monitoring program. The intent of the monitoring program is to determine the loading of floatables from the MS4 to streams within the county. The permittee will implement the floatables monitoring program as follows:
>
> a) Monitoring shall be conducted at five (5) monitoring sites located at MS4 outfalls and/or streams receiving discharges from the MS4.
>
> b) Monitoring shall be conducted once per quarter after program implementation.
>
> c) The monitoring program shall include the count of floatables visually observed and length or area of sites assessed.

This program manual describes the methods and procedures for Prince William County's Floatables Monitoring Program. All procedures are subject to modification as program feasibility and applicability are assessed during program implementation. All program modifications will be noted as part of the County's Program Plan.

II. Site Selection

a. Initial Locations and Site Screening

i. Methods and Results

Initial site locations were provided by the Prince William County Soil and Water Conservation District (PWCSWCD) from a list of sites currently monitored under its stream stewards program. These nine sites were selected as the starting point during site screening since the PWCSWCD currently visits these sites on a quarterly basis, and Floatables monitoring could straightforwardly be incorporated with the stream stewards program.

Three additional sites were identified using GIS in the need to incorporate a more diverse set of land uses in the floatables analysis, as the sites monitored by PWCSWCD were located in mostly residential areas. These sites were located by making an overall observation of the County's service area and the location of its regulated outfalls in relation to areas with diverse land uses. The first supplementary site was located off of Liberia Avenue, near the intersection of Liberia and route 294. This site includes discharge from an upstream commercial area. The second additional site is located on flat branch near the intersection of Sudley Road and Goodwin Drive. This site incorporates an area with a high degree of impervious surfaces and includes drainage from commercial and industrial land uses. Finally the third additional site is located on Cornice Place off of Old Bridge Road. This area drains from a smaller shopping center, and would be a good opportunity to see how BMPs applied in that shopping center can effect floatables numbers downstream.

b. Selection of final sampling sites

i. Methods

Sites identified during initial site screening were visited and scored according to a set of metrics. These metrics were adopted in order to identify optimal locations for floatables monitoring. Metrics incorporated elements analyzing the quality of upstream conditions, land uses, safety and access of the site, size of contributing drainage systems, and opportunity to reduce floatable sources. Each metric was scored on a scale of 1-5 with a score of 5 being the most desirable, and 1 being the least. The total score for each site was calculated by averaging the scores from each metric for the site. Sites with the highest average score were the most desirable for use in the floatables monitoring program.

Within each site, a sampling area will be selected. This sampling area will outline where volunteers or staff are to assess floatables. This sampling site will be selected during the first sampling period, and will encompass the area where the most floatables are identified.

ii. Results

All 12 sites were analyzed for use in the program. The score results from each site are located in Table 1 below.

Table 1: Site Assessment Scores

Site	Score
Site 7: Neabsco Creek, Andrew Leitch Park	3.6
Site 10: Liberia and 294	3.6
Site 3: Dawkins Branch, Victory Elementary	3.4

Site 11: Flat Branch	3.4
Site 12: Cornice Place and Old Bridge Road	3.2
Site 4: Dewey's Creek, Wayside Drive	3.2
Site 9: Powell's Creek, Monclair	3.0
Site 6: Hooe's Run, Springwood Drive	2.6
Site 5: Hooe's Run, Castile Court	2.6
Site 2: Catharpin Creek, James Long Park	2.6
Site 8: Neabsco Creek, Cloverdale Park	2.4
Site 1: Bull Run, Ben Lomond Park	0

Site scores varied from 3.6 to 0. Site 1 was disqualified due to a lack of MS-4 outfalls discharging into the stream segment. Sites that ranked the highest typically had a mix of contributing land uses and highly accessible, countable, and identifiable sources of floatables within the stream segment. Sties typically had one to three regulated outfalls discharging to the stream, and had medium to small contributing drainage areas. The top 5 sites are selected for the program, with the top 2 sites used for the pilot study. Completed site assessment sheets are available in Appendix A.

c. Site Rotation

Sites will be rotated from monitoring cycle if it is determined that the site does not perform as expected. This can occur for several reasons such as, if the site does not receive sufficient trash counts, if access to the site becomes too dangerous for staff to safely perform monitoring, or if activities occur on site that render monitoring impractical such as a stream restoration or redevelopment projects. Sites must remain in the program for at least one year before being replaced by another site, unless circumstances arise that prevent monitoring from occurring.

Replacement sites will be selected in the same method as described above in section b. New candidate sites will be selected from the list of sites that were not selected in the initial site selection procedure and from suggestions from County Staff.

III. Field Procedures

a. Pilot Program

i. Methods

To test and refine monitoring program procedures as well as assess staff effectiveness in monitoring efforts, the Floatables Monitoring Program will first operate under a pilot program. The pilot program will conduct monitoring at two sites for four sampling periods. In order to proceed with main sampling program in a reasonable timeframe, the pilot monitoring will take place at an accelerated schedule. Instead of sampling once per quarter, monitoring will be conducted once per month. Factors such as sampling procedures, sampling site characteristics, safety measures, and monitoring forms will be evaluated during this time. The pilot program will last a total of 4 months before the main monitoring program begins.

ii. Results

Pilot Program results will be included at the end of the pilot study for the program.

b. Training

Sampling will be performed with a mix of paid staff and volunteers. In order to maintain consistency in the program in the event that different groups of people sample different sites, or different groups of people sample from each sampling period to the next, training must take place. Staff will be responsible for reading and understanding the methods presented in this manual, and relaying that information to volunteers. Staff will be directed to either be present during all sampling events, or at the very least be present for the first sampling event a volunteer participates in. Important concepts to place emphasis on when training volunteers are bankfull depth, the location of site markers, and the layout of the sampling form. A sampling manual shall be provided to each volunteer performing monitoring and each inspection sheet will include instructions and a detailed list of site locations. Volunteers can be directed to contact PWC staff if needed.

c. Sampling Methods

Sampling will be consistent across all sites. As referenced in section II.b, a sampling area will be selected within each monitoring site. The sampling area will be identified on site with simple wooden stakes. The stakes will be labeled to indicate the direction to follow when sampling and also indicate the bankfull height of the stream. If a distinct sampling direction is not indicated, it will be assumed sampling will take place in the direction of stream flow. The distance between stakes will be approximately 100 ft. Floatables monitoring staff will walk the length of the sampling area counting the type and amount of each floatable type. Refuse will be considered a floatable eligible to be counted if it is above the water line, within the confines of the stream, and below the bankfull mark of the channel, as described in figure 1 below. Observations will be recorded on the form presented in section IV.a. Data sheets will be provided to the County at the end of each monitoring year and kept within the County's Floatables monitoring manual in Appendix B.

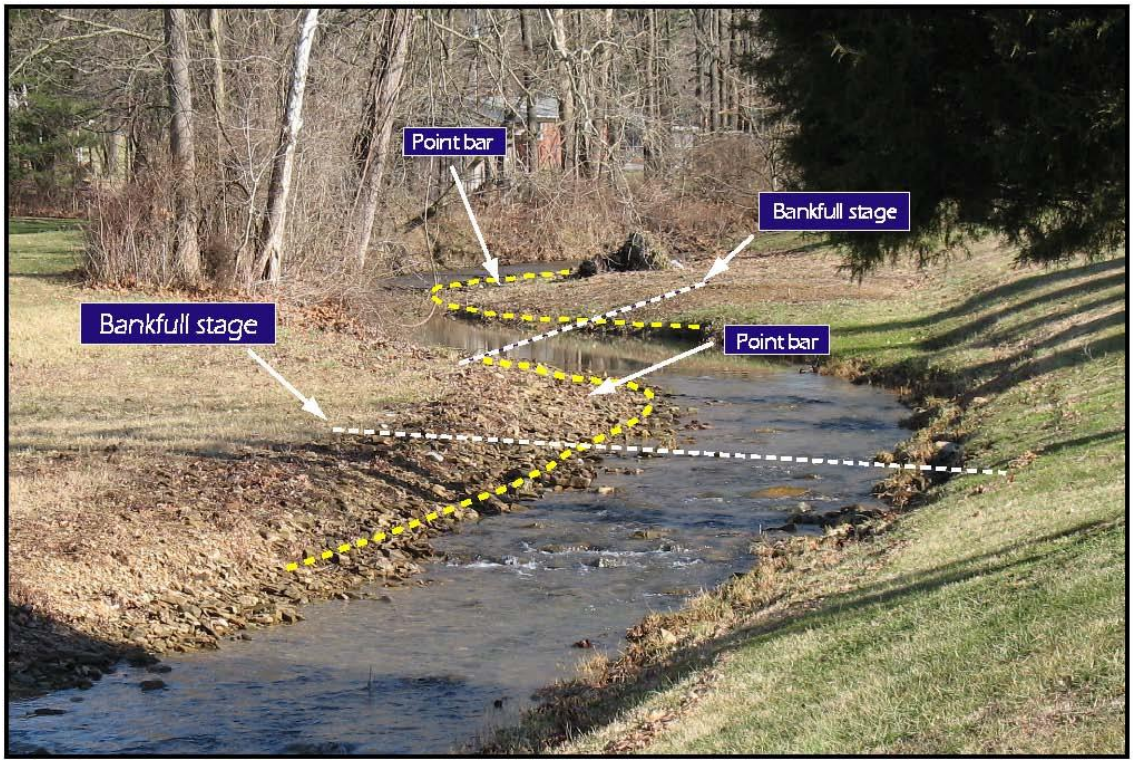


Figure 1. Bankfull Diagram, Credit Indiana FDH

d. Safety

Safety an important goal of the floatables monitoring program. When performing monitoring, staff should be equipped with proper footwear and clothing. This includes at a minimum closed toed shoes. Staff are recommended to also wear long sleeved shirts and pants, as well as waterproof gaiters or shoes in the event entering the stream is necessary. Staff should avoid accessing areas with high slopes and steep drop-offs.

The accessibility and safety of monitoring sites are incorporated in the site analysis used to determine sampling sites. Within sampling sites, sampling areas are identified that incorporate safe access and easy visibility for monitoring. Health and safety responsibility and accountability involves every employee. Some additional measures that should be followed or noticed includes:

1) Bring cell phone on all field site visits.

2) Exercise caution when encountering any wildlife and hazardous plants. In addition, many outfalls are located in remote areas that may be near gathering places for homeless or transient individuals. Do not enter a potentially hostile area.

3) Use common sense during electrical storms and/or when severe conditions (e.g., high wind, hail) develop. The safety of field staff overrides all other considerations.

4) Storm sewers contain a variety of water-borne bacteria and other harmful chemicals. Wash hands or use anti-bacterial wipes or hand gels liberally, especially prior to lunch breaks, etc.

i. DANGEROUS FLORA AND FAUNA

During the course of field activities, employees may come in contact with a wide range of dangerous or toxic animals and plants. Dangerous animals may include: black widow and brown recluse spiders; fire ants; mosquitoes and biting flies; bees, wasps and hornets; ticks and chiggers; microbial organisms (e.g., found in water, soil, and air and on carrier/host organisms); rabid mammals; and poisonous snakes. Dangerous plants may include: thorny plants; poison ivy, oak, and sumac; and molds, mildews, and fungi (which may cause allergic reactions). Contact with these organisms can cause effects from simple discomfort (such as from thorny bush scratches) to severe allergic reactions and possibly death. If interactions do occur, take appropriate actions related to specific interaction and individual response to interaction.

ii. WEATHER-RELATED HAZARDS

Weather-related hazards include the potential for heat or cold stress, electrical storms, treacherous weather-related working conditions, high winds, and limited visibility. These hazards correlate with the season in which site activities occur. In the event of adverse weather conditions, the Field Team Leader will determine if work can continue without endangering the health and safety of site personnel.

iii. HEAT STRESS

Heat stress is a significant potential hazard during the warmer months. Heat stress manifests itself as one of three conditions: heat cramps, heat exhaustion, or heat stroke. Heat cramps are brought about by a prolonged exposure to heat. As an individual sweats, water and salts are lost by the body, triggering painful muscle cramps.

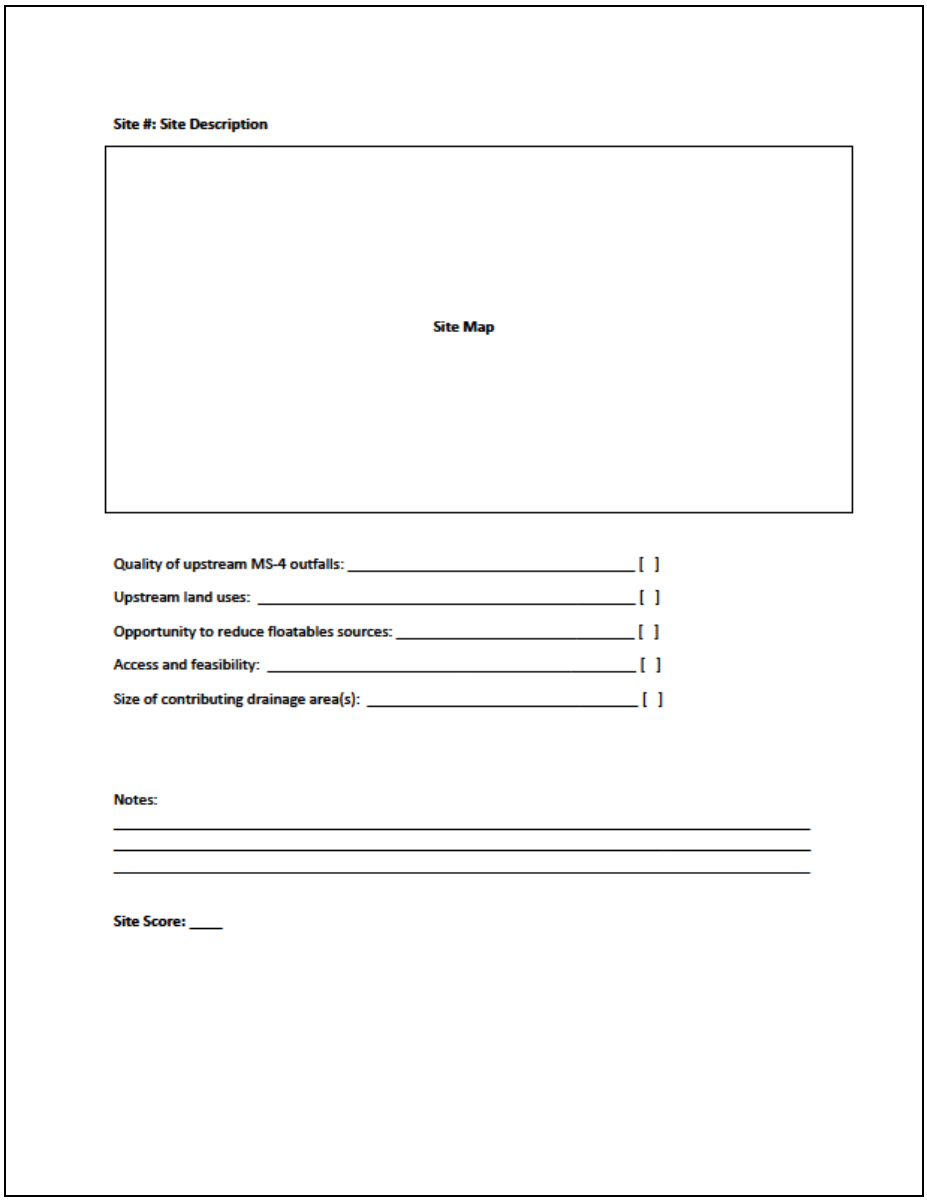
iv. COLD STRESS

Cold stress is a danger at low temperatures and when the wind chill factor is low. Cold stress is generally described as a local cooling (frost nip, frost bite, and freezing) or a general cooling (hypothermia). Personnel working outdoors in temperatures at or below freezing may be subject to local cooling. Areas of the body that have a high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. General cooling (hypothermia) occurs when exposure to cold reduces body temperature. With prolonged exposure, the body becomes unable to maintain its proper internal temperature. Without treatment, hypothermia will lead to stupor, collapse, and death. Prevention of cold stress is a function of whole body protection. Adequate insulated clothing will be worn when the air temperature drops below 50 °F. Reduced work periods maybe necessary in extreme conditions to allow adequate periods in a warm area.

IV. Documentation

a. Forms

There are two types of data acquisition forms used in the program, the site identification/evaluation form, and the field inspection form. The site identification/evaluation form is used during the site selection process to evaluate potential sampling sites. It will also be used whenever new potential sites are evaluated for inclusion into the program. This form uses a set of metrics to score and average to generate a quantitative comparison between candidate sites. An example of the Site identification form can be seen in figure 2 below:



Site #: Site Description

Site Map

Quality of upstream MS-4 outfalls: _____ [ ]

Upstream land uses: _____ [ ]

Opportunity to reduce floatables sources: _____ [ ]

Access and feasibility: _____ [ ]

Size of contributing drainage area(s): _____ [ ]

Notes:

_____

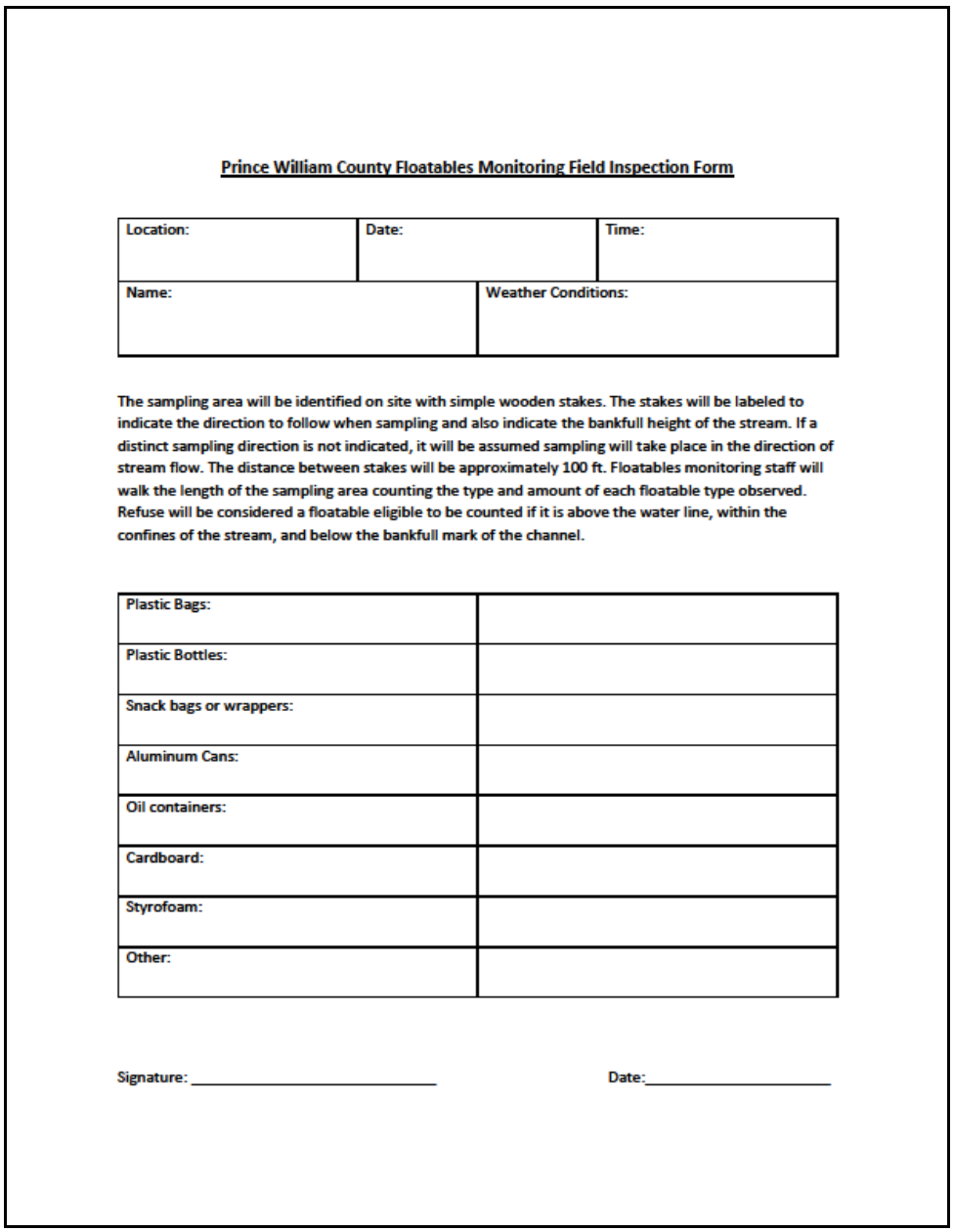
_____

_____

Site Score: ____

Figure 2: Site Identification Form

Field inspection forms are completed during each inspection. They incorporate information on the date, time, weather conditions, and site number of the inspection, Information on the person/group performing the inspection, and information on the floatables found on site. Each inspection from includes the basic sampling methods, and breaks down each floatable type typically observed in the field. An example of the field inspection form can be seen in figure 3 below:



Prince William County Floatables Monitoring Field Inspection Form

Location:	Date:	Time:
Name:	Weather Conditions:	

The sampling area will be identified on site with simple wooden stakes. The stakes will be labeled to indicate the direction to follow when sampling and also indicate the bankfull height of the stream. If a distinct sampling direction is not indicated, it will be assumed sampling will take place in the direction of stream flow. The distance between stakes will be approximately 100 ft. Floatables monitoring staff will walk the length of the sampling area counting the type and amount of each floatable type observed. Refuse will be considered a floatable eligible to be counted if it is above the water line, within the confines of the stream, and below the bankfull mark of the channel.

Plastic Bags:	
Plastic Bottles:	
Snack bags or wrappers:	
Aluminum Cans:	
Oil containers:	
Cardboard:	
Styrofoam:	
Other:	

Signature: _____ Date:_____

Figure 3: Field Inspection Form

b. Documentation and trends analysis

Data gathered in the field will be organized using an excel database provided by Prince William County. This database incorporates all site characteristics and inspections and allows for the easy identification of continued trends within each sampling site.

Each site has its own sheet within the database. Each sheet contains easily identifiable areas to enter data gathered from the field. Each site is identified at the top of the sheet along with a description of the site location. This database will be the main form of data transfer between monitoring staff and PWC.

V. Future Program Goals

a. Trash Mitigation plans

As data is gathered at sampling sites, an effort to help reduce the amount of floatables entering the streams will be developed. Using data gathered on floatables entering the stream segments, a determination of their source will be made. Efforts will then be undertaken in the surrounding drainage areas to reduce the amount of the floatables identified in the stream reaches.

These mitigation plans will focus on efforts such as ensuring recycling and trash bins have lids, enhancing trash storage, enforcing and promoting current recycling standards, promoting trash pickup events, encouraging street sweeping efforts in commercial areas, and other methods. An assessment on the effectiveness of these efforts can then be made, with the possibility of expanding mitigation plans to other parts of the County.

b. Adapting to changing MS-4 Regulations

As the program continues throughout the length of the County's current MS-4 permit, the County will monitor trends related to future requirements within the MS-4 program. This could lead to changes in the floatables monitoring program. Since the permit requirements can only be changed during permit issuance, current program goals and methods will remain constant throughout each permit period (5 years). As the timeline advances towards the County receiving a new MS-4 permit, potential changes to the program will be observed and incorporated into the next monitoring period.

APPENDIX A – Site Identification Forms

Site 1: Bull Run, Ben Lomond Park

Quality of upstream MS-4 outfalls: No quality upstream outfalls [0]

Upstream land uses: Residential, Some Commercial [2]

Opportunity to reduce floatables sources: _____ [ ]

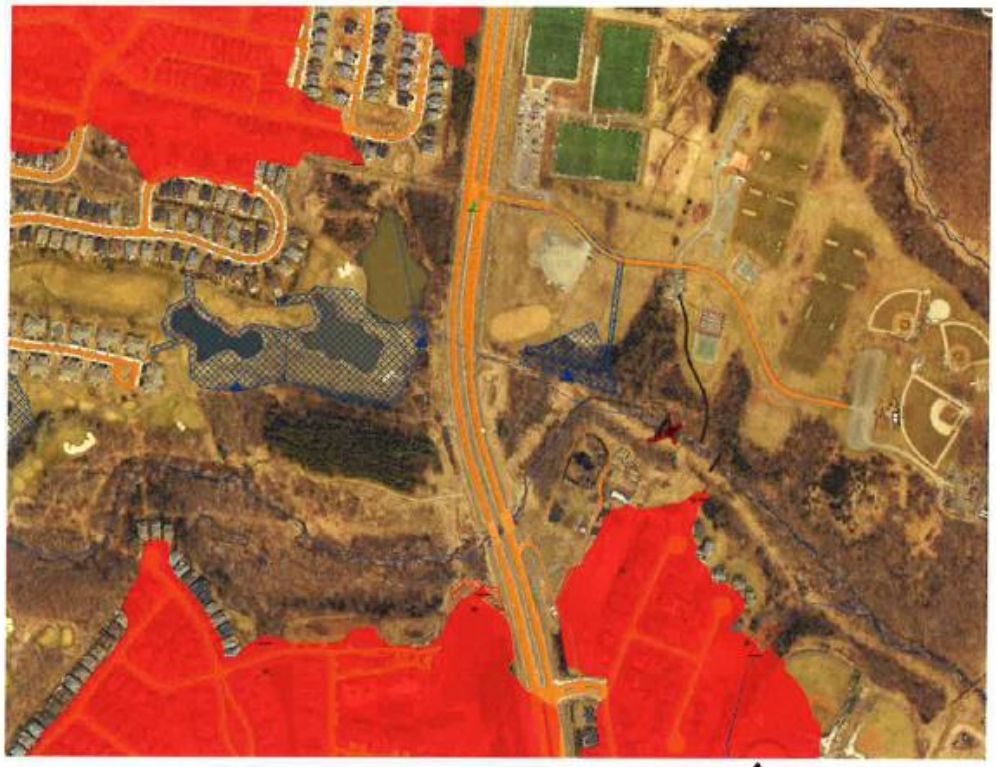
Access and feasibility: _____ [ ]

Size of contributing drainage area(s): Large >10ac [3]

Notes:
No MS-4 outfalls eliminates this site from the floatables monitoring program.

Site Score: 0

Site 2: Catharpin Creek, James Long Park



Quality of upstream MS-4 outfalls: Mostly Nonpoint, One MS-4 outfall [1]

Upstream land uses: Residential, Large lot, Sports Complex [2]

Opportunity to reduce floatables sources: Not much trash present [1]

Access and feasibility: Very easy access, ~~limited~~ Easy Mobility [store] [5]

Size of contributing drainage area(s): Small-Med [4]

Notes:

Access easily available from library parking lot. Site is devalued by lack of floatables input, Not many MS-4 outfalls Nearby, Little Nonpoint Sources. Site good for monitoring, Bad for trend analysis

Site Score: 2.6

Site 3: Dawkins Branch, Victory Elementary School

Quality of upstream MS-4 outfalls: 2 Quality outfalls [2 3]

Upstream land uses: Residential, Schools, Roadway [3]

Opportunity to reduce floatables sources: Some floatables, limited but existing sources [4]

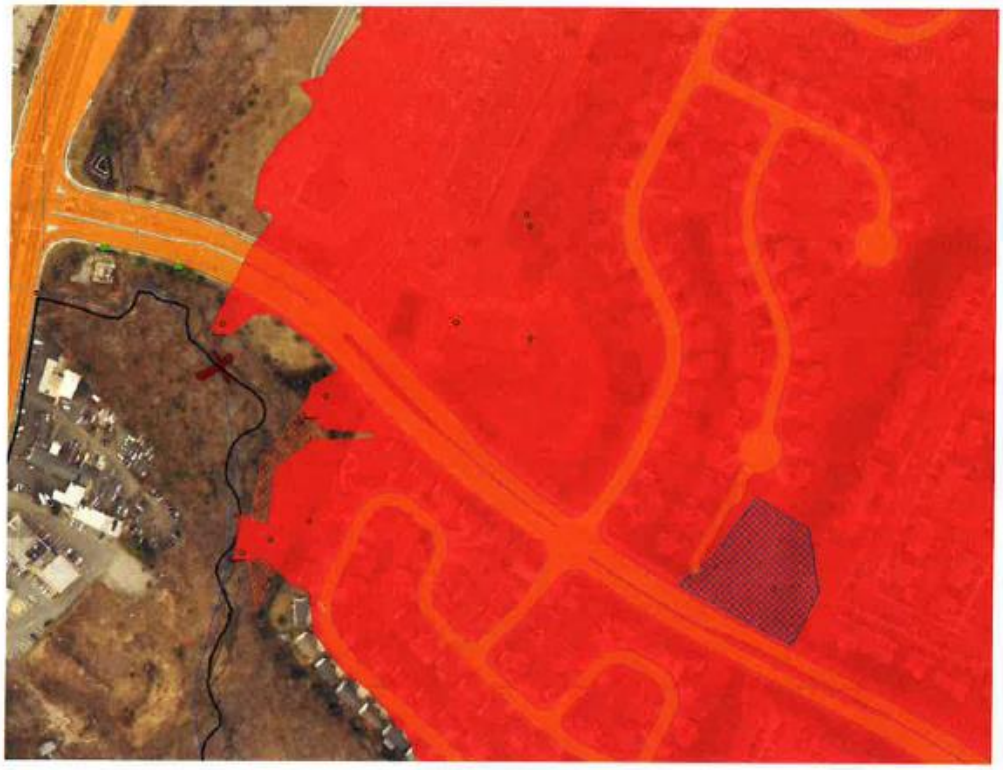
Access and feasibility: Both sides easy access, Lateral access good [5]

Size of contributing drainage area(s): Med - large [3]

Notes:
Good open area for monitoring. Outfalls can be Isolated to single residential area. Not many floatables present when site inspection occured

Site Score: 3.4

Site 4: Dewey's Creek, Wayside Drive



Quality of upstream MS-4 outfalls: One gravity outfall, [3]

Upstream land uses: Residential, Commercial, Roadway [4]

Opportunity to reduce floatables sources: Large amount of trash → Trash source from Streambank [4] 3

Access and feasibility: Available Parking, easy access [3]

Size of contributing drainage area(s): Large [3]

Notes:

Stream will undergo Restoration project in Coming years. May Complicate Monitoring efforts [fall 2016]. Could be good pilot site

Site Score: ~~3.5~~ 3.2

Site 5: Hooes Run, Castile Court

Quality of upstream MS-4 outfalls: 2-3 quality outfalls [3]

Upstream land uses: Residential [2]

Opportunity to reduce floatables sources: good amount of trash identifiable sources [4]

Access and feasibility: Neighborhood w/ little parking, hill difficult [2]

Size of contributing drainage area(s): Medium [2]

Notes:

good opportunity to reduce floatables, Access may be difficult, Steep slopes down to stream, and stream has high steep banks.

Site Score: 2.6

Site 6: Hooes Run, Springwood Drive

Quality of upstream MS-4 outfalls: 3 quality outfalls [3]

Upstream land uses: Residential [2]

Opportunity to reduce floatables sources: little to no trash [2]

Access and feasibility: hilly area to descend, path helps access [3]

Size of contributing drainage area(s): med- large [3]

Notes:

larger stream, access good, but ~~needs~~ may vary according to where along reach sampling occurs. Very little trash in stream.

Site Score: 2.6

Site 7: Neabsco Creek, Andrew Leitch Park

Quality of upstream MS-4 outfalls: 2 quality outfalls [2]

Upstream land uses: Residential Small lot [3]

Opportunity to reduce floatables sources: Low numbers of floatables [4]

Access and feasibility: good access, ~~Too few Inputs~~ good isolated inputs [5]

Size of contributing drainage area(s): Small - Mid [4]

Notes:

Many potential sampling sites, ~~Not much trash found in Stream~~ access is good. Stream size is good. ~~Easily~~ Simple area to reduce floatables.

Site Score: 3.6

Site 8: Neabsco Creek, Cloverdale Park

Quality of upstream MS-4 outfalls: 2-3 quality [3]

Upstream land uses: Residential [2]

Opportunity to reduce floatables sources: would be difficult to ID sources, little amount of trash [2]

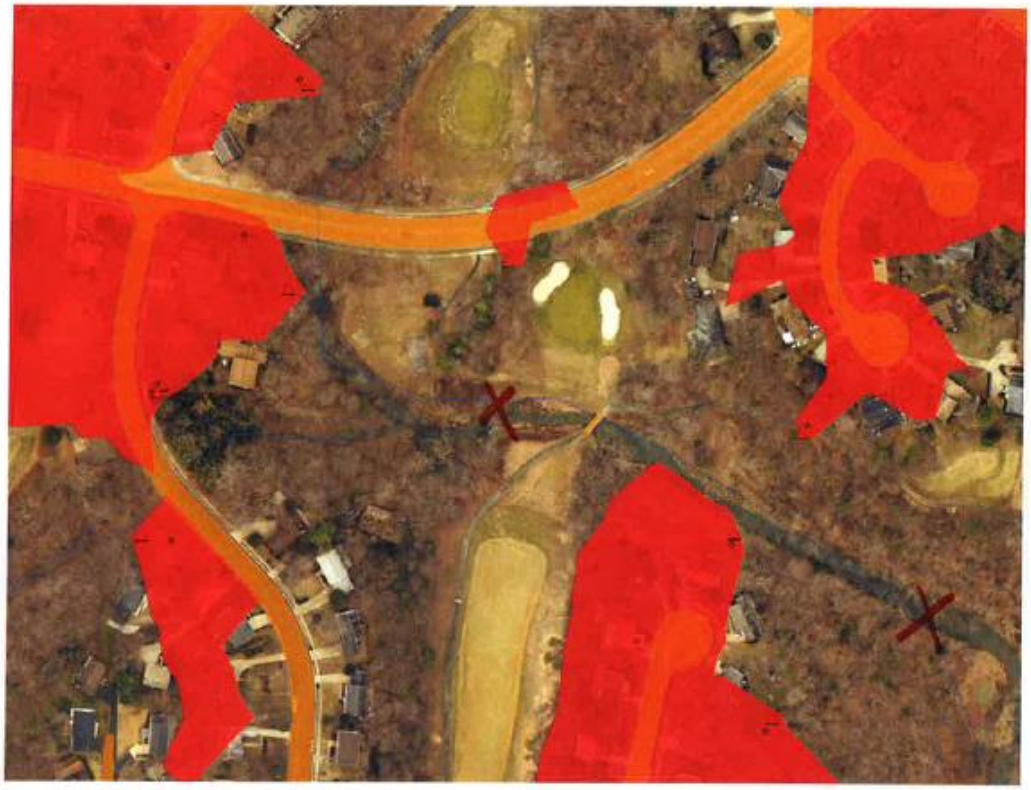
Access and feasibility: bag way from parking, wide deep channel [2]

Size of contributing drainage area(s): Med-Large [3]

Notes:
wide stream makes it difficult for monitoring efforts.

Site Score: 2.4

Site 9: Powells Creek, Monclair



Quality of upstream MS-4 outfalls: 1-2 quality outfalls [2]

Upstream land uses: Residential. [2]

Opportunity to reduce floatables sources: ~~Some trash, difficult to determine inputs~~ [2] Some trash Identifiable sources (3)

Access and feasibility: ~~large distance from parking, access through [illegible] Deep, wide channel~~ easy access (4)

Size of contributing drainage area(s): Small-med [4]

Notes:
Trash great as part of Prior Stream Restoration project which must be removed from analysis. Wide but shallow stream that receives high flows.

Site Score: 3.0

Site 10:

Quality of upstream MS-4 outfalls: Many upstream outfalls [4]

Upstream land uses: Commercial/Residential [4]

Opportunity to reduce floatables sources: Some [3]

Access and feasibility: Fence impedes Access, Action- Solve stream access [3]

Size of contributing drainage area(s): Small-med [4]

Notes:

No Current Sampling Site. ~~Image [illegible] Private property~~

Mostly Residential, Need access to BMP, But Site can be located Before Fence off area leaves Identifiable Input Drainage Areas. Floatables are Present, but have potential for more.

Site Score: 3.6

Site 11: Flat Branch

(2)

Quality of upstream MS-4 outfalls: Many [4]

Upstream land uses: Commercial/ Residential [4]

Opportunity to reduce floatables sources: Sufficient floatables [4]

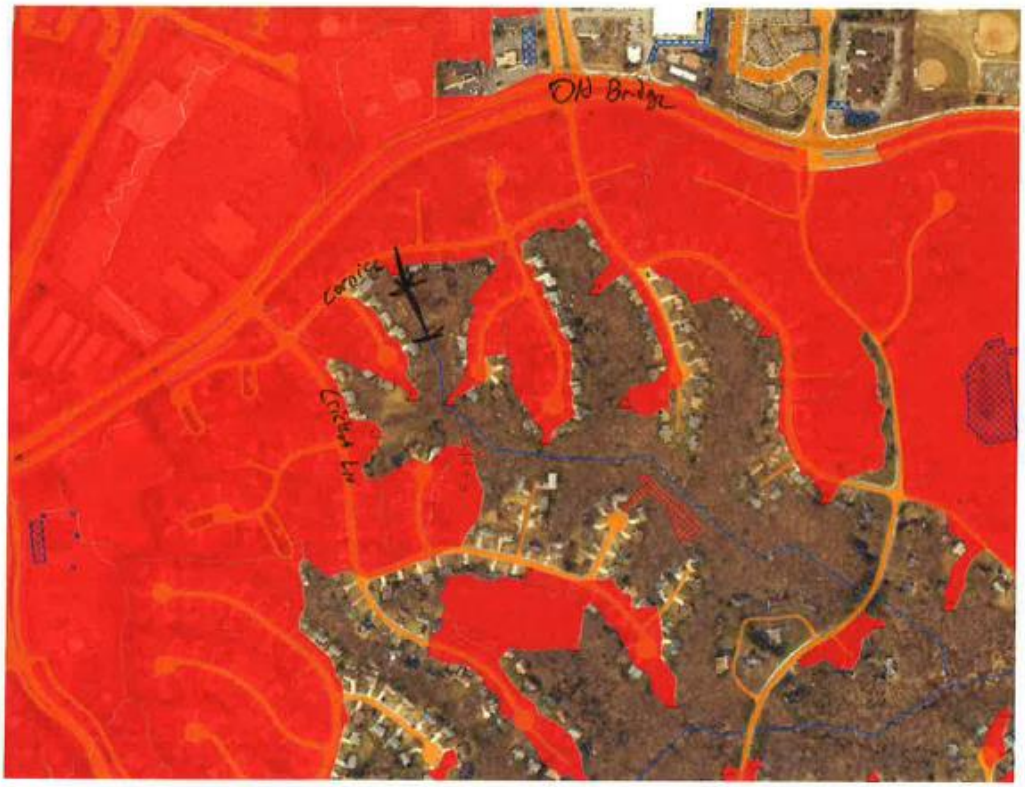
Access and feasibility: Ingress/Egress through private property [3] Local access good

Size of contributing drainage area(s): Large [2]

Notes:
No current sampling site. Ingress/Egress through private property. Sufficient floatables exist, but may not be attributed to MS-4 outfalls. Transported from upstream

Site Score: 3.4

Site 12:



Quality of upstream MS-4 outfalls: Many [4]

Upstream land uses: Commercial / Residential [4]

Opportunity to reduce floatables sources: Good amount of floatables [4]

Access and feasibility: Small stream, easy access from Roadway [3]

Size of contributing drainage area(s): Very Large [1]

Notes:
No Current Sampling site. Small stream with good floatable #s. Easy access
May be able to discern source of floatables for Resid Commercial Sources

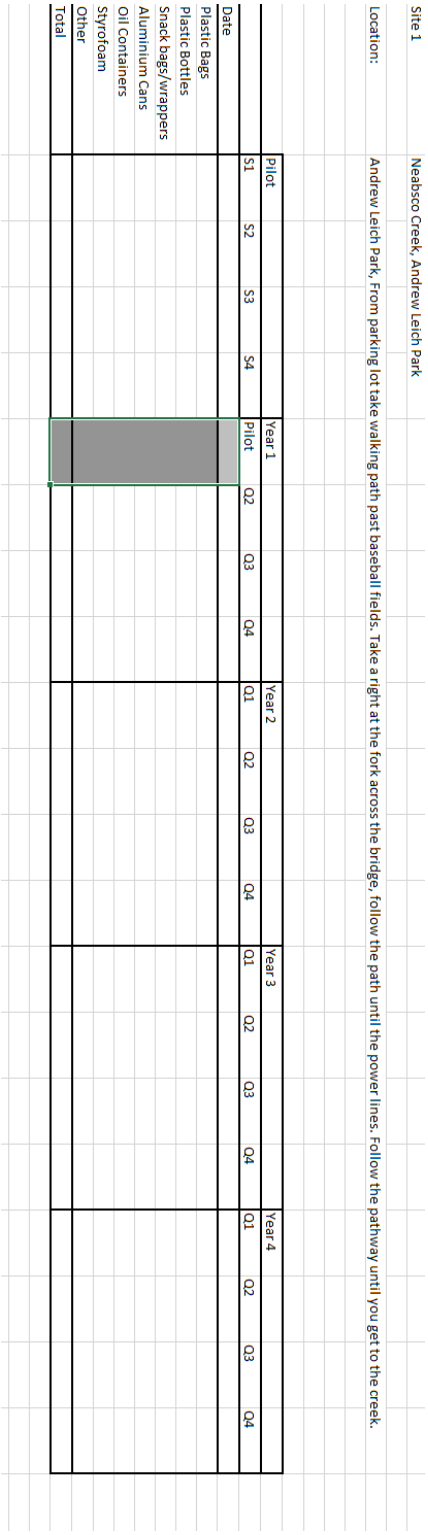
Site Score: 3.2

APPENDIX B – Field Inspection Forms

Forms will be added to this section upon completion

APPENDIX C – Floatables Monitoring Database

An example page from the document is presented below:



Site 1 Neabsco Creek, Andrew Leich Park

Location: Andrew Leich Park. From parking lot take walking path past baseball fields. Take a right at the fork across the bridge, follow the path until the power lines. Follow the pathway until you get to the creek.

	Pilot				Year 1				Year 2				Year 3				Year 4			
	S1	S2	S3	S4	Pilot	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Date																				
Plastic Bags																				
Plastic Bottles																				
Snack bags/wrappers																				
Aluminium Cans																				
Oil Containers																				
Styrofoam																				
Other																				
Total																				

Prince William County Floatables Monitoring Field Inspection Form

Location:	Date:	Time:
Name:	Weather Conditions:	

The sampling area will be identified on site with simple wooden stakes. The stakes will be labeled to indicate the direction to follow when sampling and also indicate the bankfull height of the stream. If a distinct sampling direction is not indicated, it will be assumed sampling will take place in the direction of stream flow. The distance between stakes will be approximately 100 ft. Floatables monitoring staff will walk the length of the sampling area counting the type and amount of each floatable type observed. Refuse will be considered a floatable eligible to be counted if it is above the water line, within the confines of the stream, and below the bankfull mark of the channel.

Plastic Bags:	
Plastic Bottles:	
Snack bags or wrappers:	
Aluminum Cans:	
Oil containers:	
Cardboard:	
Styrofoam:	
Other:	

Signature: _____ Date:_____

Appendix III – Administrative and Programmatic

Public Works

Mission Statement

The goal of the Prince William County Department of Public Works is to improve the wellbeing of our community. We do the right thing by creating and sustaining the best environment in which to live, work and play. We protect and improve our natural and historic resources, adopt and enforce codes and regulations, and build and maintain the infrastructure needed for employees to serve our community.

Expenditure Budget: $86,149,775

50.6% of Community Development

Community Development Expenditure Budget: $173,566,908

Program:

- Director's Office: $764,109
- Historic Preservation: $1,460,406
- Stormwater Infrastructure Management: $3,554,418
- Site Development: $3,548,301
- Watershed Improvement: $7,828,811
- Fleet Management: $11,256,917
- Facilities Construction Management: $130,040
- Sign Shop: $218,954
- Small Project Construction: $1,880,890
- Mosquito & Forest Pest Management: $1,900,067
- Solid Waste: $24,445,268
- Buildings & Grounds: $11,712,129
- Property Management: $12,879,467
- Neighborhood Services: $4,204,687
- Service Districts (Bull Run & Lake Jackson): $365,311

Mandates

There are state mandates for public records management and preservation, and to maintain existing street name signs. Public Works provides these mandated services. Public Works is liaison to the state mandated Chesapeake Bay Preservation Area Review and Wetlands Boards. The Board of County Supervisors has enacted additional local mandates for which Public Works has responsibility.

State Code: Chapter 7, Virginia Public Records Act; Highways, Bridges and Ferries, 33.2-328, Wetland Board, 28.2-1303, Chesapeake Bay Preservation Area Review Board, Title 9, Virginia Administrative Code, 62.1-44.15:24

County Code: Chapter 2 (Wetlands Areas; Coastal Primary Sand Dunes & Beaches Zoning Ordinance; Historical Commission), Chapter 3 (Amusements), Chapter 5 (Building Maintenance Code), Chapter 12 (Massage Establishments), Chapter 13-320.1 (Designation of watercraft, boat trailer, motor home, and camping trailer "restricted parking" zones), Chapter 14 (Noise), Chapter 16-56 (Graffiti Prevention and Removal), Chapter 22 (Refuse), Chapter 23 (Public Sanitary Sewers), Chapter 23.2 (Stormwater Management), Chapter 25 (Subdivisions - Minimum Requirements), Chapter 29 (Weeds & Grass), Chapter 32 (Zoning), Chapter 33 (Expedited Land Development Plan Review)

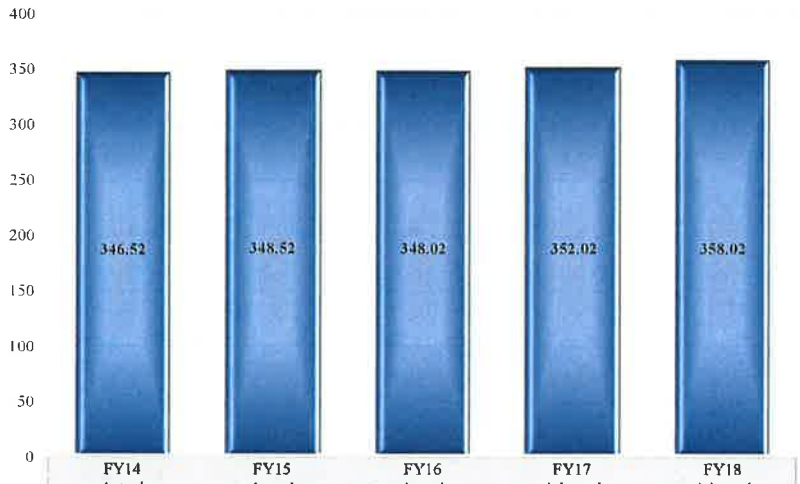
Expenditure and Revenue Summary

Expenditure by Program	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Adopted	FY18 Adopted	% Change Budget FY17/ Budget FY18
Public Works Director's Office	$1,279,245	$1,314,234	$1,326,506	$720,936	$764,109	5.99%
Historic Preservation	$1,461,803	$1,502,082	$1,352,263	$1,425,258	$1,460,406	2.47%
Stormwater Infrastructure Management	$2,649,889	$2,970,781	$2,798,956	$3,302,756	$3,554,418	7.62%
Site Development	$2,758,501	$3,113,044	$3,129,368	$3,299,188	$3,548,301	7.55%
Watershed Improvement	$3,390,972	$3,156,787	$4,326,518	$5,015,908	$7,828,811	56.08%
Fleet Management	$10,391,824	$10,231,551	$9,509,587	$10,996,131	$11,256,917	2.37%
Facilities Construction Management	$197,895	$1,551	($14,110)	$119,149	$130,040	9.14%
Sign Shop	$230,756	$231,381	$245,535	$205,435	$218,954	6.58%
Small Project Construction	$2,048,951	$1,599,435	$2,713,579	$2,058,102	$1,880,890	(8.61%)
Mosquito & Forest Pest Mgmt	$1,503,026	$1,417,367	$1,431,993	$1,808,077	$1,900,067	5.09%
Solid Waste	$19,094,885	$19,020,477	$16,579,543	$17,651,541	$24,445,268	38.49%
Buildings & Grounds	$10,736,120	$10,479,664	$10,463,388	$10,667,356	$11,712,129	9.79%
Property Management	$10,787,030	$10,991,654	$11,096,827	$12,312,610	$12,879,467	4.60%
Neighborhood Services	$3,295,480	$3,711,504	$3,783,055	$4,085,882	$4,204,687	2.91%
Service Districts	$462,222	$336,990	$226,516	$365,311	$365,311	0.00%
Total Expenditures	**$70,288,599**	**$70,078,503**	**$68,969,521**	**$74,033,639**	**$86,149,775**	**16.37%**

Expenditure by Classification						
Salaries and Benefits	$25,195,601	$25,210,806	$27,216,854	$27,957,906	$29,422,351	5.24%
Amortization	$3,774,243	$2,386,372	$1,483,825	$1,755,699	$2,085,793	18.80%
Capital Outlay	$2,658,020	$2,752,188	$2,144,190	$4,103,041	$4,343,048	5.85%
Contractual Services	$11,104,589	$10,818,362	$11,607,479	$13,246,082	$14,076,374	6.27%
Debt Maintenance	($35)	$0	$0	$0	$0	0.00%
Depreciation	$3,171,757	$4,015,054	$1,404,086	$1,007,569	$2,098,713	108.29%
Internal Services	$2,986,634	$3,822,599	$3,277,379	$2,778,723	$2,835,975	2.06%
Purchase of Goods & Services	$11,577,531	$11,328,794	$11,038,682	$14,520,167	$14,926,921	2.80%
Leases & Rentals	$6,247,571	$6,452,339	$6,513,416	$6,959,789	$7,528,497	8.17%
Reserves & Contingencies	($829,535)	($997,515)	($1,407,876)	($3,570,217)	($3,796,909)	6.35%
Transfers Out	$4,402,221	$4,289,504	$5,691,485	$5,274,880	$12,629,012	139.42%
Total Expenditures	**$70,288,599**	**$70,078,503**	**$68,969,521**	**$74,033,639**	**$86,149,775**	**16.37%**

Funding Sources						
Revenue from Federal Government	$267,260	$267,260	$330,000	$330,000	$330,000	0.00%
Permits & Fees	$1,901,782	$2,297,479	$2,300,354	$2,407,996	$2,407,996	0.00%
Fines & Forfeitures	$1,163	$570	$9,015	$0	$0	0.00%
Use of Money & Property	$1,762,644	$1,728,145	$1,978,405	$1,989,190	$1,989,190	0.00%
Revenue from Other Localities	$56,997	$2,839	$0	$0	$0	0.00%
Miscellaneous Revenue	$165,859	$259,314	$516,140	$243,000	$492,932	102.85%
Non-Revenue Receipts	$157,526	$223,397	$423,236	$173,700	$173,700	0.00%
General Property Taxes	$1,540,997	$1,599,105	$1,710,112	$1,794,771	$1,794,771	0.00%
Charges for Services	$35,348,742	$36,322,119	$38,453,850	$36,837,933	$37,098,719	0.71%
Revenue from Commonwealth	$480,227	$1,295,388	$517,762	$552,728	$552,728	0.00%
Transfers In	$10,417,561	$2,356,503	$3,549,431	$2,028,088	$1,785,390	(11.97%)
Total Designated Funding Sources	**$52,100,758**	**$46,352,120**	**$49,788,306**	**$46,357,406**	**$46,625,426**	**0.58%**
Use/(Contribution) of Fund Balance	**($7,702,986)**	**($3,747,682)**	**($7,386,786)**	**($1,097,820)**	**$8,673,751**	
Net General Tax Support	**$25,890,827**	**$27,474,065**	**$26,568,001**	**$28,774,053**	**$30,850,598**	**7.22%**
Net General Tax Support	**36.84%**	**39.20%**	**38.52%**	**38.87%**	**35.81%**	

Staff History by Program



	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Adopted	FY18 Adopted
Director's Office	6.77	5.77	5.77	5.77	5.27
Historic Preservation	14.55	14.55	14.55	14.55	14.55
Stormwater Infrastructure Management	60.90	24.97	23.75	25.15	25.16
Site Development	0.00	25.71	27.70	27.79	27.78
Watershed Improvement	0.00	11.93	11.27	11.28	11.22
Fleet Management	35.15	35.15	35.15	35.15	35.15
Facilities Construction Management	8.50	9.50	9.50	9.50	10.00
Sign Shop	3.84	4.12	4.03	4.12	4.16
Small Project Construction	17.20	15.11	14.98	14.39	14.43
Mosquito & Forest Pest Management	13.81	13.91	14.02	14.02	14.00
Solid Waste	59.72	59.72	60.72	60.72	60.72
Buildings & Grounds	72.97	74.97	73.47	76.47	80.47
Property Management	16.00	16.00	16.00	16.00	18.00
Neighborhood Services	37.11	37.11	37.11	37.11	37.11
Service Districts (Bull Run & Lake Jackson)	0.00	0.00	0.00	0.00	0.00
Full-Time Equivalent (FTE) Total	**346.52**	**348.52**	**348.02**	**352.02**	**358.02**

Future Outlook

County Facilities Are Over Capacity - Many County facilities are currently at or beyond capacity. In particular, staff housed at the Judicial Center, Sudley North, Ferlazzo, Public Safety Training Center, and Fleet Management facilities have faced increasing shortages in space for several years. These facilities support Public Safety and Human Service agencies, which have experienced growth and will continue to grow as the population increases. Many steps have been taken to accommodate this growth such as reducing space standards, making conference rooms into office space and fragmenting agencies into other facilities both owned and leased. However, at this point these tactics have exhausted their effectiveness and all future growth will have to be accommodated through additional leased space or the construction of additional County facilities.

Deferred Facility Maintenance - Public Works maintains over 130 facilities and 1.2 million square feet. These facilities range in age from brand new (Montclair Library) to 269 years old (Rippon Lodge). In order to comply with the American Public Works Association accreditation standards and the County's Principles of Sound Fiscal Management, Public Works implements both a daily maintenance program and a cyclic replacement program for major facility components. As new facilities are brought on line and the existing facilities are aging, Public Works is unable to keep pace with the cyclic replacement schedules. This translates into a large

deferred maintenance list. Eventually, the deferred items will fail and staff will have to replace systems during an emergency situation, which will be significantly more expensive than if they were managed according to a schedule. Furthermore, system failures will interrupt needed services provided to residents at these facilities.

Facility Security Concerns - Facility Security continues to be a growing concern for the safety of staff and protection of property. As acts of violence around the country directed toward government institutions have become more frequent, security assessments of major County complexes will need to occur. In FY16, Public Works completed a security assessment of the Judicial Center, which recommended $4.55 million in security enhancements. These recommendations will be implemented in FY17. Also at the end of FY16, a security assessment of the Prince William County (PWC) Government Center Complex was initiated. Dedicated resources will be needed to complete and implement these assessments.

Increase in Environmental Mandates - Environmental Services is concerned about the resources needed to comply with the ever increasing federal and state requirements for Chesapeake Bay Restoration and Total Maximum Daily Loads (TMDL) reductions for water quality improvements. The ability to achieve large pollutant reductions will require new programs that enable the County to meet these strict stormwater regulations. These initiatives will require increased funding, which may necessitate increases in stormwater management fees for residential and commercial property.

General Overview

A. **Internal Service Fund (ISF) Technology Budget** - The County annually allocates all technology costs to agencies through an ISF, using the approved cost basis for each technology activity. Technology activities include phone, radio and computer support, business systems support, GIS, web services, capital equipment replacement, and administration. In FY18, the Public Works technology bill increases by $40,011.

B. **Snow Removal Budget Increase** - Based on the three and five prior year averages of snow removal expenditures, the Public Works snow removal budget is being increased by $200,000. In prior years when there were major snow events, Public Works would have to request funding from the contingency budget.

C. **Site Inspections Funding Shift** - Since 2010, funding for the site inspections activity was split between the stormwater management fee and land development fees. In FY17, funding for site inspections was shifted to development fees and the Virginia Stormwater Management Program (VSMP). Development fees funds 60%, VSMP fees funds 20% and the stormwater management fee funds the remaining 20% of site inspections. The stormwater management (SWM) fee will continue to fund federal and state mandated activities for Chesapeake Bay TMDL reductions and water quality improvements. In FY18, the split will be 68% development fees, 22% VSMP and 10% SWM fees. In FY19, the plan is to have the site inspections function funded 75% by development fees and 25% by VSMP.

Budget Initiatives

A. Budget Initiatives

1. Maintenance and Custodial Services for Central District Police Station – Buildings & Grounds

Expenditure	$575,201
Revenue	$0
General Fund Impact	$575,201
FTE Positions	4.00

a. Description - Central District Police Station is scheduled to be operational in summer 2017. This initiative funds three custodians and one maintenance mechanic to maintain the new county facility.

b. Service Level Impacts - The new police station, a 24/7 facility, adds 57,000 square feet of building maintenance and support to the county's facility inventory.

2. Utilities for Central District Police Station – Property Management

Expenditure	$163,684
Revenue	$0
General Fund Impact	$163,684
FTE Positions	0.00

a. Description - Central District Police Station occupancy is planned to occur in summer 2017. This initiative is for a full year of utility costs.

b. Service Level Impacts - The new police station adds 57,000 square feet of facility space requiring 24/7 supply for all utilities.

3. Lease Escalation and Utility Increase Costs – Property Management

Expenditure	$383,671
Revenue	$0
General Fund Impact	$383,671
FTE Positions	0.00

a. Description - This initiative provides additional funding for existing facilities utilities ($61,597) and funding for lease escalation costs as well as new leased space for the Brentsville District Supervisor and the Community Services Clubhouse ($322,074).

b. Service Level Impacts - Existing service levels are maintained.

4. **Building & Facility Capital Program – Property Management**

Expenditure	$187,838
Revenue	$0
General Fund Impact	$0
FTE Positions	2.00

a. **Description** - This initiative provides funding for two FTEs, an Engineer III and a Construction Coordinator, to establish and manage a capital component replacement program. These two positions will be funded by the project budget so there is no general fund impact.

b. **Service Level Impacts** - Existing service levels are maintained.

5. **Contract Increases – Buildings & Grounds**

Expenditure	$115,969
Revenue	$0
General Fund Impact	$115,969
FTE Positions	0.00

a. **Description** - This initiative provides additional funding for the following contracts:

- custodial services contract ($35,000)
- security guard services ($70,969)
- trash/recycling services ($10,000)

b. **Service Level Impacts** - Existing service levels are maintained.

6. **Support for Landfill Capital Projects – Solid Waste**

Expenditure	$4,483,000
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - This initiative funds the landfill capital projects in the FY2018-FY2023 Capital Improvement Program (CIP). The solid waste enterprise fund balance funds this one-time transfer. There is no general fund impact.

b. **Service Level Impacts** - Existing service levels are maintained.

7. One-time Increase Equipment and Vehicle Budget – Solid Waste

Expenditure	$633,000
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. Description - This initiative provides one-time funding for the scheduled replacement of solid waste equipment and is funded by existing revenue from the solid waste fee. The equipment being replaced includes one track loader used to process waste ($495,000), four recycling trailers ($48,000), a slope mower ($50,000) and a pickup truck ($40,000).

b. Service Level Impacts - Existing service levels are maintained.

8. Increase Oil and Anti-Freeze Recycling Budget – Solid Waste

Expenditure	$20,500
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. Description - Contractors have started charging for used motor oil & antifreeze collection services. Also, the periodic pump out of sludge and other undesirable materials from the motor oil and anti-freeze recycling tanks is required. This initiative is funded by existing solid waste fee revenue.

b. Service Level Impacts - Existing service levels are maintained.

9. Replace Scale Operating Software – Solid Waste

Expenditure	$110,000
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. Description - This initiative funds the replacement of the weigh scale software used at County solid waste facilities. The program depends on the current software system for weighing and billing of material arriving at facilities. The current system has been used by PWC in excess of 20 years and has reached its maximum data management capabilities. This is a one-time cost that is fully funded by existing solid waste fee revenue.

b. Service Level Impacts - Existing service levels are maintained.

10. Landfill Solar Lease Project – Solid Waste

Expenditure	$245,034
Revenue	$249,932
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - The Board of County Supervisors (BOCS) authorized an agreement with CGC, Inc. via BOCS Resolution 15-370 to develop a solar energy generation project at the landfill. The County will cover annual lease costs by the sale of excess power generated and solar renewable energy credits (SRECS). In addition, the County may see a reduction in the annual electric utility expenditures.

b. **Service Level Impacts** - Once complete this project will result in renewable energy being provided directly to buildings on the landfill property.

11. Northern Virginia Waste Management Program Contribution Increase – Solid Waste

Expenditure	$1,663
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - PWC is part of the Northern Virginia Regional Commission. In addition to the general contribution there is a $13,068 contribution to the Northern Virginia Waste Management Program that is paid by the solid waste enterprise fund. This is a $1,663 increase over FY17.

b. **Service Level Impacts** - Existing service levels are maintained.

12. Support for Watershed Projects – Watershed Improvement

Expenditure	$2,572,867
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - This initiative funds the watershed projects in the FY2018-FY2023 CIP. The transfer is funded by the stormwater management fee current year revenue and fund balance. There is no general fund impact.

b. **Service Level Impacts** - Existing service levels are maintained.

13. Watershed and Bacterial TMDL Action Plan Studies – Watershed Improvement

Expenditure	$450,000
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - The County's Municipal Separate Storm Sewer System (MS4) permit requires a watershed study be completed every other year ($350,000) and a bacterial TMDL action plan study be completed ($100,000). These studies are funded by the stormwater management fee so there is no impact on the general fund.

b. **Service Level Impacts** - Existing service levels are maintained.

14. Funding Increase to the Soil and Water Conservation District – Watershed Improvement

Expenditure	$4,745
Revenue	$0
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - The Prince William Soil and Water Conservation District (PWSWCD) is focused on protecting and enhancing the water and soil resources in the county. It is funded by the county via the existing stormwater management revenue and the Virginia Department of Conservation and Recreation. This initiative will increase the county funding to PWSWCD by 2% from $237,264 to $242,009.

b. **Service Level Impacts** - Existing service levels are maintained.

15. Replace Litter Crew Truck – Neighborhood Services

Expenditure	$55,000
Revenue	$55,000
General Fund Impact	$0
FTE Positions	0.00

a. **Description** - This initiative funds the replacement of a litter crew truck that has exceeded the recommended mileage maximum. All litter crew expenditures are funded by a transfer from the Solid Waste Enterprise Fund. There is no general fund impact.

b. **Service Level Impacts** - Existing service levels are maintained.

Program Summary

Director's Office

Provide overall leadership and management oversight for all Public Works activities. Review all major policy issues, financial transactions, BOCS reports, County Executive generated tracker reports and interface with executive management and the citizens of PWC on complex issues within the department.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Key department program measures met	77%	62%	54%	70%	70%
Public Works DART Score (Days Away, Restricted or Transferred)	8.1	3.0	7.9	4.5	6.2

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Leadership & Management	**$1,279**	**$1,314**	**$1,327**	**$721**	**$764**
BOCS agenda items	42	68	55	54	55

Historic Preservation

Manage the capital funding (through grants and capital program), design, restoration, and preservation of all County-owned historic sites. Engage in historic collections management. Support the work plan developed by the Historic Preservation Foundation. Manage the daily operations of County historic sites, including the site specific volunteers, assist with collections, and ensure the protection of the resources. Manage rentals, educational outreach, special events, and programming of all County-owned historic sites.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Customer satisfaction with visit to historic site	95.0%	96.0%	97.0%	95.0%	95.0%
Volunteer hours value	$212,186	$106,580	$111,498	$150,000	$125,000
Revenue recovery rate	4.9%	4.1%	4.3%	5.0%	5.0%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Preservation	**$680**	**$403**	**$378**	**$364**	**$378**
Annual average hours of service per long term volunteer	57	41	41	50	50
Archeological collections donated to the County	5	11	9	9	9
Management & Events Programming	**$782**	**$622**	**$576**	**$600**	**$606**
Programs at historic sites	1,212	768	832	850	900
FTE equivalent of volunteer hours contributed	6	3	3	4	3
Visitors to historic sites	53,708	70,892	82,841	77,000	100,000
Maintenance & Construction	**$0**	**$477**	**$398**	**$461**	**$476**
Work orders for historic buildings and grounds	172	137	111	150	150
Construction, restoration and renovation projects	4	3	3	3	3

Stormwater Infrastructure Inspections & Maintenance

Ensure that the County's stormwater infrastructure is in compliance with environmental regulations, standards, and policies including County standards, the Chesapeake Bay TMDL, and the County's MS4 permit. The program consists of the inspection of existing infrastructure, such as storm drain inlets, storm sewers and stormwater management facilities within County easements, as well as major maintenance of County-maintained facilities.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Drainage assistance requests responded to within 5 business days	96%	97%	99%	90%	95%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Stormwater Management Infrastructure Inspection	**$883**	**$859**	**$576**	**$701**	**$784**
County-maintained facilities inspected and/or re-inspected	1,449	843	875	875	900
Privately-maintained facilities inspected and/or re-inspected	312	375	266	200	200
Miles of drainage systems inspected	804	634	243	150	175
Stormwater Management Infrastructure Maintenance	**$1,767**	**$2,112**	**$2,223**	**$2,601**	**$2,770**
Major maintenance cases completed/closed	138	191	277	150	200

Site Development

Review multiple levels of land development plans and inspection of construction sites, to ensure compliance with environmental regulations, standards and policies related to stormwater management, best management practices, erosion and sediment control, resource protection areas, floodplains and geotechnical.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Site development plan submissions reviewed within county standards	100%	100%	99%	100%	100%
Lot grading plan submissions reviewed within 10 business days	100%	100%	100%	100%	100%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Plan Review	**$1,198**	**$1,491**	**$1,513**	**$1,591**	**$1,728**
Site development plan submissions reviewed	540	495	366	500	450
Lot grading lots reviewed	1,169	1,140	1,117	1,100	1,000
Site Inspections	**$1,560**	**$1,622**	**$1,616**	**$1,709**	**$1,821**
Virginia Stormwater Management Program & erosion & sediment control inspections	23,681	18,285	17,364	20,000	20,000

Watershed Improvement

Ensure that the water quality of streams within each of the County's watersheds is in compliance with environmental regulations, standards, and policies including the Chesapeake Bay TMDL and the County's MS4 permit. The focus of this program is to address water quality issues associated with illicit pollution discharges into the storm drainage system, discharge of pollutants from industrial activities, sediment release associated with stream erosion, and the reduction of nitrogen, phosphorous and sediment loads from stormwater runoff. The program includes the assessment of streams and other natural resources within each watershed, identification of problem areas, and implementation of water quality improvements. In addition, environmental education, outreach, and technical assistance to citizens, both in urban areas as well as within the agricultural community, are components of this program.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Industrial or high risk inspections conducted	25	60	31	80	25
Linear feet of stream restorations completed	1,100	1,100	1,468	2,500	2,500

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Watershed Monitoring	**$3,001**	**$2,762**	**$3,897**	**$4,581**	**$7,386**
Linear feet of stream assessments completed	94,302	67,457	56,800	60,000	60,000
Dry weather outfalls monitored and inspected	513	1,366	1,187	1,000	1,000
Watershed Improvements	**$390**	**$395**	**$430**	**$435**	**$442**
Pounds of phosphorus reduction achieved	-	-	100	50	100

Fleet Management

Provide county vehicle maintenance and county vehicle replacement. Provide fuel, repairs, and maintenance to the County's vehicles and equipment in an efficient and cost effective manner and minimize downtime due to breakdowns or other unscheduled maintenance. Replace County vehicles at the optimum point in the vehicle life cycle, maximizing cost-effectiveness and vehicle safety and reliability.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Cost per mile - light duty public safety vehicles	$0.26	$0.25	$0.27	$0.28	$0.28
Cost per mile - light duty non-public safety vehicles	$0.35	$0.34	$0.33	$0.34	$0.34
Work orders that are scheduled maintenance	58%	57%	56%	58%	58%
Availability of public service light duty vehicles	90%	91%	90%	92%	92%
Public Safety vehicles due or overdue for replacement	14%	10%	5%	8%	8%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
County Vehicle Maintenance	**$7,745**	**$7,425**	**$7,071**	**$8,346**	**$8,607**
Vehicles maintained that are under 10,000 lbs. gross vehicle weight	1,124	1,153	1,208	1,145	1,245
Heavy equipment maintained that are over 10,000 lbs. gross vehicle weight	226	227	229	225	233
Fleet work orders	7,390	8,293	7,094	7,500	7,758
County Vehicle Replacement	**$2,646**	**$2,806**	**$2,439**	**$2,650**	**$2,650**
General fund vehicles purchased	109	96	115	95	76

Facilities Construction Management

Support the CIP by developing budgets and managing the design and construction of County facilities. The majority of expenditure costs in this activity are recovered from capital projects.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
FCM customers satisfied with overall project management	90%	90%	100%	90%	90%
CIP construction change order different from original contracted amount	5%	3%	5%	<10%	<10%
CIP change orders based on user requested changes from total change order costs	4%	1%	12%	<10%	<10%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
County Facility Construction	**$198**	**$2**	**($14)**	**$119**	**$130**
Total CIP projects	9	9	9	8	8
Total non-CIP projects	5	2	2	4	0

Sign Shop

The Sign Shop inspects, fabricates, installs and maintains all street name signs as mandated by the Virginia Code § 33.2-328, the Code of Ordinances, County of Prince William Section 24-3 and the County's Design and Construction Standards Manual (DCSM) Section 604.06. In addition, the program produces high quality graphics for County vehicles and creates custom-designed original graphic designs for interior and exterior signs, banners, posters, and displays for County agencies, outside jurisdictions and developers.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Street name signs replaced within 7 days of inspection	83%	71%	77%	85%	80%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Street Name Signs	**$231**	**$215**	**$215**	**$203**	**$204**
Streets requiring street name signs	9,450	9,483	9,696	9,600	9,700
Street name signs fabricated for maintenance	664	485	723	600	700
Signs and Graphics	**$0**	**$16**	**$30**	**$2**	**$15**
Signs and graphics fabricated for revenue	13,648	12,049	11,686	11,000	11,500
Sign and graphic jobs completed	569	631	616	650	625

Small Project Construction

Provide support for a variety of County projects including stormwater maintenance, stream restorations, drainage improvements, parks, and transportation improvements.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Community improvement projects completed within 10% of estimated cost	91%	96%	97%	95%	95%
Community improvement projects completed on time	96%	99%	100%	-	-

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Small Community Improvement Construction	**$2,049**	**$1,599**	**$2,714**	**$2,058**	**$1,881**
Community improvement projects completed	57	81	61	50	50

Mosquito & Forest Pest Management

Survey, reduce, and control mosquitoes and certain forest pest populations. Program objectives include minimizing mosquito-transmitted disease by reducing mosquito populations and breeding sites, minimizing tree defoliation and mortality caused by the gypsy moth and fall cankerworm, conducting surveillance and outreach for Emerald Ash Borer, Asian Longhorned Beetle, Thousand Cankers Disease, Sudden Oak Death and Oak Splendour Beetle and minimizing adverse environmental and human health impacts resulting from the treatment of these pests.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Mosquito traps processed within 48 hours	-	98%	100%	98%	98%
Gypsy moth egg mass surveys done by November 1st	-	97%	89%	95%	95%
Citizen site visit requests responded to within 24 hours	97%	89%	98%	95%	95%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Mosquito/Forest Pest Monitoring	**$685**	**$850**	**$835**	**$984**	**$996**
Larval mosquito habitat inspections	4,053	5,840	5,726	5,000	5,000
Reduction and Response	**$818**	**$568**	**$597**	**$824**	**$904**
Mosquito larvicide applications	2,278	1,474	1,874	1,500	1,500

Solid Waste

Provide solid waste management services to all citizens, institutions, and businesses of PWC. Facilities and programs promote waste reduction and recycling, and efficiently receive and process all acceptable household and commercial wastes generated within the geographical boundaries of PWC, including the towns of Dumfries, Haymarket, Occoquan, and Quantico. Processing of the waste will meet or exceed all applicable federal, state, and local regulations.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Refuse recycled	41%	41%	34%	43%	35%
Tons of refuse processed	349,276	403,080	435,623	350,000	450,000

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Solid Waste Management & Administration	**$4,859**	**$5,917**	**$3,016**	**$3,458**	**$4,781**
Non-residential accounts processed	4,014	4,139	4,153	4,000	4,200
Appeals completed within 30 days	100%	100%	100%	>99%	>99%
Yard Waste Composting	**$2,851**	**$2,865**	**$2,590**	**$3,596**	**$3,584**
Tons of County yard waste diverted from waste stream	19,016	17,324	28,132	22,000	29,000
Solid Waste Facilities Operation	**$7,169**	**$9,379**	**$10,305**	**$7,724**	**$9,507**
Refuse trucks inspected	4,087	4,311	4,199	4,000	4,000
Pounds of Household Hazardous Waste and eWaste collected	1.5M	1.7M	1.5M	1.7M	1.7M
Citizens trips to Solid Waste facilities	486,199	511,225	532,526	515,000	520,000
Recyclable Materials Collected, Processed & Marketed	**$4,216**	**$860**	**$668**	**$1,118**	**$1,083**
Tons of recyclables processed and marketed	12,721	10,227	9,741	10,500	1,000
Revenue generated from sale of recyclables	$594,000	$576,000	$413,977	$500,000	$520,000
Landfill Closure	**$0**	**$0**	**$0**	**$1,756**	**$5,491**

Buildings & Grounds

Provide building maintenance services to over 130 owned facilities and selected leased properties; landscaping, grounds in-house and contract maintenance, snow removal, paving repair and installation, and moving services; custodial services for over 1.2 million square feet; and mail and printing services supporting the needs of the County government. Provide 24/7 operation and responsive emergency support to address natural or manmade disasters.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Cost per square foot for custodial services	$2.38	$2.29	$2.29	$2.36	$2.33
Routine maintenance work requests completed within ten (10) working days	70%	76%	79%	73%	73%
Cost per square foot for building maintenance program service	$2.73	$2.74	$3.70	$2.82	$3.09
Printing jobs completed on time	87%	87%	91%	89%	91%
Routine grounds maintenance requests completed within ten (10) working days	95%	87%	87%	92%	92%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Building Maintenance	**$5,301**	**$4,841**	**$4,268**	**$5,043**	**$5,404**
Work orders	6,194	5,000	4,475	5,600	4,435
Grounds Maintenance	**$1,169**	**$1,198**	**$1,507**	**$1,273**	**$1,537**
Grounds work requests	789	797	776	787	787
Custodial Services	**$2,541**	**$2,576**	**$2,786**	**$2,959**	**$3,251**
Square footage maintained	1.5M	1.1M	1.2M	1.1M	1.2M
Graphics Arts & Print Shop	**$638**	**$633**	**$564**	**$0**	**$85**
Copies produced in-house	8.1M	8.1M	4.6M	7.6M	5.0M
Printing jobs completed	1,074	2,223	2,338	1,732	2,450
Mail Room and Courier Service	**$295**	**$335**	**$421**	**$397**	**$400**
Total pieces of mail handled	1.3M	1.3M	1.4M	1.4M	1.4M
Security	**$793**	**$897**	**$917**	**$995**	**$1,035**
Citizen meetings supported by guard service	96%	97%	94%	95%	95%
Alarms and access devices work orders	1,063	788	862	944	914

Property Management

Provide a wide array of internal county services including space planning, agency moves, furniture purchasing, and management of surplus furniture items. Manage the leases of county buildings and the utility payments and energy usage monitoring of both owned and leased properties. Manage the County's Records Center in accordance with the mandated Library of Virginia retention standards.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Customers satisfied with overall project management	99%	97%	98%	98%	98%
Average cost per square foot of leased space	$18.79	$19.07	$19.55	$19.93	$19.25
Cost avoidance realized by redeploying surplus items	$191,143	$140,349	$189,734	$150,000	$150,000

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Property Management	**$1,469**	**$1,563**	**$2,031**	**$2,379**	**$2,389**
Property management projects completed	240	215	282	250	250
Energy Management	**$3,082**	**$2,982**	**$2,672**	**$3,025**	**$3,249**
Annual facility electrical usage - KWH per square foot	20	19	19	19	19
Real Estate	**$6,115**	**$6,318**	**$6,240**	**$6,750**	**$7,076**
Commercial square feet leased	317,814	324,309	323,309	328,509	330,741
Records Management	**$121**	**$129**	**$153**	**$159**	**$165**
Boxes delivered/picked up	5,292	7,723	5,424	5,000	5,300
Records checked in/checked out	7,996	8,270	8,436	8,000	8,300

Neighborhood Services

Provide a safe, clean and healthy community through education, community support and property code enforcement. Provide programs that teach residents and business owners how to properly maintain their properties, and work with neighborhood leaders to enforce property codes that go to the heart of the County's quality of life. Stimulate volunteer efforts across the County that empower citizens to clean trash and litter from common areas, waterways and the County's major roadways, to remove graffiti and other community maintenance issues in and around neighborhoods and to address other challenges by working together.

Key Measures	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Founded current year PCE cases resolved or moved to court action within 100 days	95%	98%	91%	96%	91%
Designated road avg litter rating- 1= no visible trash and 5= trash dumping site	2	2	1	2	2
First inspection of complaint within seven days	97%	-	93%	83%	85%
Average time to resolve cases (calendar days)	45	22	54	35	45

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY14 Actuals	FY15 Actuals	FY16 Actuals	FY17 Adopted	FY18 Adopted
Litter Control	**$695**	**$680**	**$709**	**$801**	**$862**
Tons of trash removed by County Litter Crew	143	195	168	170	167
Illegal signs removed from State right-of-way	10,764	13,178	17,713	12,500	12,500
Landscaping	**$329**	**$582**	**$487**	**$547**	**$547**
Landscaping areas maintained	42	44	44	44	44
Acres of medians and rights-of-way maintained	29	234	234	234	224
Property Code Enforcement	**$2,272**	**$2,450**	**$2,587**	**$2,738**	**$2,796**
Total cases resolved	4,773	4,357	6,489	4,600	5,000
Total inspections conducted	11,497	11,500	16,426	11,000	11,500

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

June 28, 2017

Christopher E. Martino
County Executive
County of Prince William
1 Complex Court
Prince William, VA 22192

Transmitted electronically to (CEmartino@pwcgov.org)

RE: Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit VA0088595, County of Prince William, Chesapeake Bay TMDL Action Plan Approval

Dear Mr. Martino:

The Department of Environmental Quality (DEQ) has reviewed the Chesapeake Bay TMDL Action Plan for received on February 21, 2017 in accordance Part I.D.1 of the MS4 Permit. Additional information was received March 13, 2017, March 14, 2017 and May 16, 2017.

As submitted, the action plan will result in the following annual reduction of pollutants of concern:

Pollutant of Concern	Annual Load Reduction (lb/yr)	Percentage of L2 Reduction Achieved After Implementation
Total Nitrogen	6706.58	33.5%
Total Phosphorus	1370.40	62.0%
Total Suspended Solids	893286.63	49.4%

The Chesapeake Bay TMDL Action Plan is hereby approved and is an enforceable part of the MS4 Program Plan.

Please note any modifications to the Chesapeake Bay TMDL Action Plan shall be made in accordance with Part I.A.7 of the MS4 Permit.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days from the date you received this decision within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Virginia Department of Environmental Quality.

Please contact Jeff Selengut at (804) 698-4265 or at Jeffrey.selengut@deq.virginia.gov if you have any questions.

Sincerely,

Allan Brockenbrough II, P.E.
Manager, Office of VPDES Permits

Copies: File
Mark Aveni, Prince William County (maveni@pwcgov.org)

Ungar, David

From: Mohan, Madan
Sent: Thursday, September 28, 2017 1:18 PM
To: Ungar, David
Subject: FW: Prince William County - Local TMDL Action Plans

From: Bauer, Jaime (DEQ) [mailto:Jaime.Bauer@deq.virginia.gov]
Sent: Friday, December 16, 2016 7:35 AM
To: Eib, Benjamin A. <BEib@pwcgov.org>
Cc: Aveni, Marc <MAveni@pwcgov.org>; Mohan, Madan <mmohan@pwcgov.org>; Mackert, Susan (DEQ) <Susan.Mackert@deq.virginia.gov>; Brooks, Kelsey (DEQ) <Kelsey.Brooks@deq.virginia.gov>
Subject: RE: Prince William County - Local TMDL Action Plans

Ben,

Kelsey Brooks and I will be working together to review the local TMDL action plans. We will let you know if we have any questions.

Jaime

Jaime L. Bauer | Environmental Specialist II | DEQ | 804-698-4416| jaime.bauer@deq.virginia.gov

From: Mackert, Susan (DEQ)
Sent: Thursday, December 15, 2016 3:54 PM
To: Eib, Benjamin A.
Cc: Bauer, Jaime (DEQ); Aveni, Marc; Mohan, Madan
Subject: RE: Prince William County - Local TMDL Action Plans

Hi Ben,

It was nice talking with you this morning. This confirms receipt of the local TMDL action plans. Staff will review and be in touch should they require any additional information or have any questions.

Hope you and your family have a wonderful holiday season.

Thanks,
Susan

Susan Mackert
Water Permit Writer, Senior II
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193
Phone: (703) 583-3853
susan.mackert@deq.virginia.gov

From: Eib, Benjamin A. [mailto:BEib@pwcgov.org]
Sent: Thursday, December 15, 2016 3:36 PM
To: Mackert, Susan (DEQ)
Cc: Bauer, Jaime (DEQ); Aveni, Marc; Mohan, Madan
Subject: Prince William County - Local TMDL Action Plans

Susan,

Per our discussion this morning, attached are the final drafts of our local TMDL Actions Plans for your review and approval. If you would like hard copies of the documents, just let me know and I'd be happy to drop them off at your office.

Let me know if you have any questions or require any additional information.

Thanks,
Ben

Benjamin Eib
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