NASA Langley Research Center
Municipal Separate Storm Sewer System (MS4)
Annual Report

Covering the period of July 1, 2015 – June 30, 2016

Submitted to the Virginia Department of Environmental Quality (DEQ) in compliance with Permit No. VAR040092

NASA LaRC MS4 Annual Report

The following provides a summary of permit year (PY) three MS4 activities showcasing LaRC's compliance with the MS4 General Permit (VAR040092) and the Year Three Program Plan. An updated Program Plan covering PY 4 has been completed and is currently being implemented. A summary of Program Plan updates can be found at the end of this Annual Report.

Annual Report Format:

- Annual Reporting requirements listed in Section II E occur on pages 2 - 5.
- Annual reporting requirements on MCMs 1 – 6 occur on pages 6 - 25.
- Annual reporting requirements of Section One Special Condition / TMDL Action Plan occur on pages 26 - 27.
- MS4 Program Plan update summary and modification requests occur on pages 28 -29.
- Certification statement occurs on page 30.
- Supporting documentation for MCM 2 compliance occurs as an appendix to this report.

Annual Reporting Requirements
GP Section II E (3)

(a) Background Information.

(1) The name and state permit number of the program submitting the annual report;

(2) The annual report permit year;

(3) Modifications to any operator's department's roles and responsibilities;

(4) Number of new MS4 outfalls and associated acreage by HUC added during the permit year; and

(5) Signed certification;

(b) The status of compliance with state permit conditions, an assessment of the appropriateness of the identified best management practices and progress towards achieving the identified measurable goals for each of the minimum control measures;

(c) Results of information collected and analyzed, including monitoring data, if any, during the reporting period;

(d) A summary of stormwater activities the operator plans to undertake during the next reporting cycle;

(e) A change in any identified best management practices or measurable goals for any of the minimum control measures including steps to be taken to address any deficiencies;

(f) Notice that the operator is relying on another government entity to satisfy some of the state permit obligations (if applicable);

(g) The approval status of any programs pursuant to Section II C (if appropriate), or the progress towards achieving full approval of these programs; and

(h) Information required for any applicable TMDL special condition contained in Section I.

(a) Background Information:

(1) NASA Langley Research Center
General Permit Registration Number VAR040092

(2) Annual Report for PY 3 covering the period of July 1, 2015 – June 30, 2016.

(3) There have been no major modifications to any operator roles and/or responsibilities. In the current MS4 Program Plan, the Standard Practice and Environmental Engineering Branch (SPEEB) (referred to as NASA Environmental) is responsible for ensuring implementation of the MS4 Program Plan and Annual Reporting.

(4) A total of 16 outfalls exist (shown in Figure 1). No new MS4 outfalls have been added during the PY.

(5) The signed Certification Statement can be found on the last page of this Annual Report.

(b) The status of compliance with state permit condition is compliant. The official assessment of the appropriateness of the identified best management practices is that the permit requirements are being adequately addressed and achieved. Progress towards achieving the identified measurable goals for each of the minimum control measures is strong. For more specifics on this please see the section on MCM reporting in the remainder of the report.

(c) No monitoring data related to the MS4 program was collected and/or analyzed. LaRC does hold an individual VPDES permit (VA0024741) that requires monitoring and Discharge Monitoring Reports (DMR). All required monitoring results associated with that permit have been submitted to VADEQ's eDMR system.

(d,e) The following is a general overview of planned activities associated with the MS4 Program for Year 4:

MCM 1 - Three new high priorities have been selected and an associated education and training plan was developed. The three priorities for Year 4 are: (1) Construction Site Erosion and Sediment Control (ESC) Best Management Practices (BMPs); (2) Dumpster Maintenance: Illicit Discharge Detection and Elimination; and (3) the Chesapeake Bay TMDL and LaRC's TMDL Action Plan. Planned outreach activities include educational articles, flyers, website resources, specific training classes, and educational signs placed at BMPs. In May 2017, MS4 staff will solicit public feedback via the @LaRC announcement system on educational high priorities for PY4.

MCM 2 – As required, the PY3 Annual Report will be posted to the public webpage. LaRC will also continue to maintain an updated MS4 Program Plan online. Lastly, LaRC will participate, through promotion, sponsorship, or other involvement, in a minimum of four local events/activities. The activities shall be aimed at increasing public participation to reduce stormwater pollutant loads; improve water quality; and support local restoration and clean-up projects, programs, groups, meetings, or other opportunities for public involvement.

MCM 3 – LaRC has a robust GIS-based MS4 map, but improvements are still planned. LaRC is on track to meet the requirement to have a complete and updated storm sewer system map and information table within 48 months of permit coverage. Currently, all conveyance systems and outfalls are mapped, but LaRC plans to add informational tables ("attributes") to each GIS outfall point showing the MS4 acreage served and the name of the receiving water listing and impairments or applicable TMDLs. The information tables will be available by clicking on the outfall point in GIS.

LaRC will continue to implement the existing Illicit Discharge Detection and Elimination (IDDE) Program. LaRC's IDDE Handbook is up-to-date and does not require an update. Adequate records will be kept on any illicit discharge found and eliminated to allow for accurate future annual reporting.

MCM 4 – LaRC will continue to implement our existing DEQ-approved Annual Standards and Specifications (AS&S) for Stormwater Management (SWM) and Erosion and Sediment Control (ESC) to ensure compliance with the MS4 Permit and Virginia Stormwater Management Program (VSMP) regulations. LaRC's Annual Standards and Specifications are currently approved through October 31, 2016. LaRC submitted a new AS&S submittal for DEQ review and approval on 9/13/2016 to Hannah Zegler.

During the PY, it is anticipated that three (3) regulated land disturbing activities will occur. Environmental staff will ensure these projects are compliant through plan review and inspection.

It is also expected during the upcoming PY that Mrs. Andrea Remington will receive her Dual Combined Administrator certification for SWM and ESC. Currently, Mrs. Andrea Remington is provisionally certified as an ESC and SWM Program Administrator, Inspector, and Plan Reviewer. Mr. Peter Van Dyke and Mr. Todd Herbert will maintain their Dual Combined Administrator certification during PY4.

MCM 5 – LaRC is planning to inspect all existing SWM facilities at least once during the PY as required. Also, LaRC will continue to work to ensure adequate maintenance of existing SWM facilities is completed. If any new SWM facilities come online during the PY, adequate documentation and records will be maintained for proper reporting to DEQ.

MCM 6 – LaRC will continue to implement the following best management practices during the PY: street sweeping, ditch/grass channel maintenance, equipment maintenance, proper salt/brine storage, outfall maintenance, catch basin maintenance/clean outs, and leaf collection. LaRC will continue to strictly limit the use of nutrients and fertilizer application on pervious turf areas. The use of multi-media environmental audits will also continue, in order to ensure facilities are operating within compliance of the MS4 permit.

A new training plan and scheduled was incorporated into the latest Program Plan. LaRC will implement the training plan during the PY, which is consistent with MS4 permit requirements. Training classes are offered for broad or targeted audiences, depending on the topic. Training topics include, but are not limited to, illicit discharge detection and elimination, good housekeeping, stormwater pollution prevention, and spill response. Audiences targeted for the PY include contractors, grounds maintenance staff, janitorial staff, civil servants, etc.

(f) Not applicable. LaRC does not rely on another government entity to satisfy some of the state permit obligations.

(g) Not applicable. LaRC does not have any such programs.

(h) LaRC currently has no waste load reductions associated with any TMDLs except the Chesapeake Bay TMDL. A previous TMDL for the Back River (Bacteria) has been pulled back, revised, and reissued. The final TMDL did not assign a WLA to NASA LaRC due to a lack of sources as indicated in the final study. No updated TMDL action plans are required at this time. During the PY, LaRC will continue to implement the approved Chesapeake Bay TMDL Plan. For specific annual reporting on the TMDL Action Plan implementation please see the appropriate report section. .

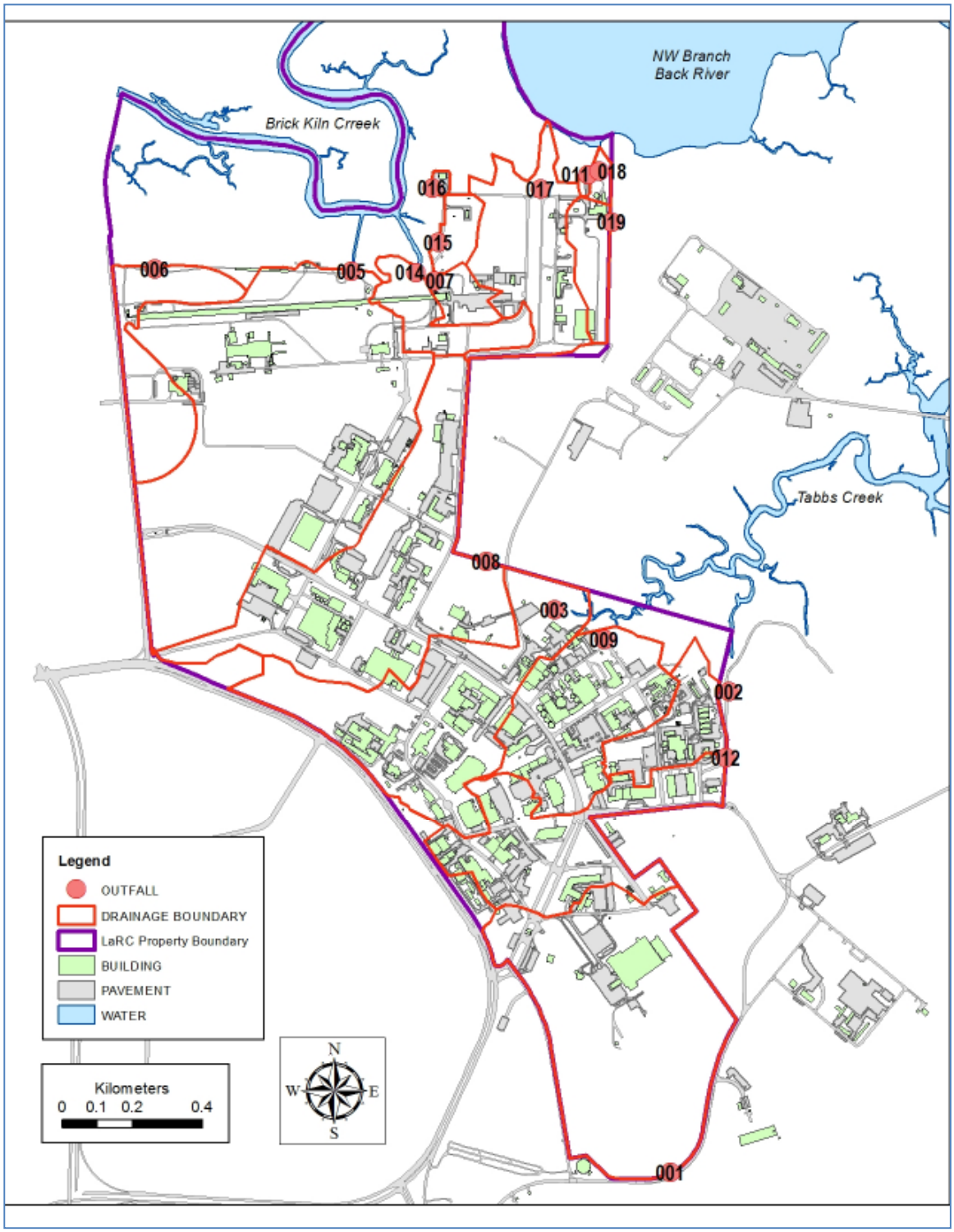

FIGURE 1 - LaRC OUTFALL AND OUTFALL DRAINAGE BASIN MAP

Minimum Control Measure One – Public Education and Outreach
Annual Reporting Requirements – GP Section II B 1 (g)

(1) A list of the education and outreach activities conducted during the reporting period for each high-priority water quality issue, the estimated number of people reached, and an estimated percentage of the target audience or audiences that was reached.

(2) A list of the education and outreach activities that will be conducted during the next reporting period for each high-priority water quality issue, the estimated number of people that will be reached, and an estimated percentage of the target audience or audiences that will be reached.

(1) The following details education and outreach activities during permit year 3:

High Priority 1: Proper Procedures for Vehicle and Power Washing
Selected Audience: Maintenance Staff and Contractors (Approx. 100 people)

- An educational article titled, *If You Use a Pressure Washer at LaRC*, was published on 3/29/16, 3/30/16, 3/31/16, and 4/1/16 with 1773, 1525, 1510, and 1478 visitors ("hits") respectively. This article focused on the steps personnel can take to ensure no discharge of power-washing wastewater on Center.
- An education article titled, *Green, Clean Car Washing*, was published on 3/29/16, 3/30/16, 3/31/16, and 4/1/16 with 1834, 1564, 1519, and 1503 visitors ("hits") respectively. This article focused on how to have an eco-friendly car wash experience and prevent stormwater pollution. It also reviewed the three state-approved car wash locations located at LaRC.
- The Environmental Website's Illicit Discharge Detection and Elimination (IDDE) section was reviewed and updated twice during the last Permit Year. The updates included (1) adding a PowerPoint presentation titled, *Recognizing and Reporting Stormwater Pollution* and (2) adding a printable poster covering preventing stormwater pollution.
- Facility Environmental Coordinator (FEC) Training was held on 7/15/15, 7/22/15, 5/18/16, and 6/14/16 with 27, 12, 24, and 10 attendees respectively. The FEC training course goes into detail about stormwater pollution prevention and the importance of proper procedures for any water discharge, including vehicle and power washing. FECs are asked to monitor their facilities for any water discharge, including these activities, and to ensure the proper procedures are being followed by all personnel performing the task.

The total number of estimated people reached was 12,779. This represents 100% of the total targeted audience.

High Priority 2: Illegal Dumping
Selected Audience: Employee Population (3000)

- An education article, titled *ONLY RAIN DOWN THE DRAIN,* was published on 7/1/15 and 7/2/15 with 4934 and 4919 visitors ("hits") respectively. The article defined an illicit discharge, and informed LaRC personnel on how they can help the Center address stormwater pollution issues by reporting what they see.
- An educational article, titled *What Can You Do to Prevent an Illicit Discharge?,* was published on 6/28/16, 6/29/16, and 6/30/16 with 556, 575, and 547 visitors ("hits") respectively. The article focused on defining, recognizing, preventing, and reporting illicit discharges.

- The Environmental Website's Illicit Discharge Detection and Elimination (IDDE) section was reviewed and updated twice during the last Permit Year. The updates included (1) adding a PowerPoint presentation titled, *Recognizing and Reporting Stormwater Pollution* and (2) adding a printable poster covering preventing stormwater pollution.
- A special training session, titled *Recognizing and Reporting Stormwater Pollution,* was held on Center 6/7/16 with 3 participants. This training educated personnel on how to recognize illicit discharges, including spills and illegal dumping, and how to report an illicit discharge at NASA Langley. Attendees also learned the impact illegal dumping has on the Chesapeake Bay, and how to prevent stormwater pollution from occurring by identifying best management practices they can follow.
- A special training session, titled *Awareness of Environmental Issues: Common Water and Waste Concerns at Construction Sites* was held on 8/11/15 with 9 attendees. This training was targeted towards personnel within the Facility Assurance, Inspection, Maintenance, & Occupational Safety Support Services (FAIMOS) contract at NASA Langley. The training focused how to prevent, recognize, and report illicit discharges at construction sites and facility maintenance projects. Topics covered included proper procedures for concrete washout, dewatering, outside storage of chemicals, secondary containment, dirt tracking from vehicles, and good housekeeping. All topics related to preventing pollutants from entering local waterways in order to maintain the health of the Chesapeake Bay.
- A specific stormwater Custodial Management Training, was held twice on 7/15/16 and had 29 total attendees. This training focused on several stormwater issues included the importance of properly disposing of wash water from cleaning activities.
- Annual Waste Management and Spill Response Training was held on 7/16/15, 7/23/15, 6/7/16, and 6/8/16 with 130, 18, 153, and 164 attendees. This annual training is mandatory for all Center employees that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains.
- Facility Environmental Coordinator (FEC) Training was held on 7/15/15, 7/22/15, 5/18/16, and 6/14/16 with 27, 12, 24, and 10 attendees respectively. The FEC training course goes into great detail about stormwater pollution prevention and LaRC's IDDE program.

The total number of estimated people reached was 12,110. This represent 100% of the total targeted audience.

<u>High Priority 3: Chesapeake Bay TMDL Education</u>
Selected Audience: Employee Population (3000)

- An educational article and infographic, titled *How to have a Healthy Lawn*, was published on 9/21/15, 9/22/15, 9/23/15, 9/24/15, and 9/25/15, with 6189, 6002, 5926, 5850, and 5802 visitors ("hits") respectively. The article and infographic provided data on stormwater runoff into the Chesapeake Bay from nutrient rich sources, like lawns. It also provided tips to reduce the pollutants entering the Chesapeake Bay while still maintaining a healthy lawn.
- An educational article, titled *The Chesapeake Bay's "Diet"*, was published on 12/8/15, 12/9/15, 12/10/15, and 12/11/15 with 1987, 2068, 1968, and 1950 visitors ("hits") respectively. The article provided background on the Chesapeake Bay TMDL, and also educated personnel on the steps taken by LaRC staff to minimize sediment and pollutant runoff from demolition and construction activities at LaRC.
- The Environmental Website's Public TMDL Page was reviewed and updated twice during the last Permit Year. Both updates were a routine update. One update also included a link to download a PowerPoint presentation on the Chesapeake Bay TMDL and LaRC's Action Plan.

- A PowerPoint presentation was distributed to personnel at NASA Langley in order to further educate individuals on the Chesapeake Bay TMDL. The presentation reviewed what LaRC is doing to meet compliance for the Bay TMDL, including what load reductions LaRC needs to achieve. The presentation was advertised through the @LaRC page on 12/15/15, 12/16/15, 12/17/15, and 12/21/15 with 1867, 1839, 1815, and 1884 visitors ("hits") respectively.
- A special training session, titled *Awareness of Environmental Issues: Common Water and Waste Concerns at Construction Sites* was held on 8/11/15 with 9 attendees. This training was targeted towards personnel within the Facility Assurance, Inspection, Maintenance, & Occupational Safety Support Services (FAIMOS) contract at NASA Langley. The training focused how to prevent, recognize, and report illicit discharges at construction sites and facility maintenance projects. Topics covered included proper procedures for concrete washout, dewatering, outside storage of chemicals, secondary containment, dirt tracking from vehicles, and good housekeeping. All topics related to preventing pollutants from entering local waterways in order to maintain the health of the Chesapeake Bay.
- A special training session, titled *Recognizing and Reporting Stormwater Pollution,* was held on Center 6/7/16 with 3 participants. This training educated personnel on how to recognize illicit discharges, including spills and illegal dumping, and how to report an illicit discharge at NASA Langley. Attendees also learned the impact illegal dumping has on the Chesapeake Bay, and how to prevent stormwater pollution from occurring by identifying best management practices they can follow. An overview of how NASA LaRC is taking steps to protect local waters and improve the health of the Chesapeake Bay was given.

The total number of estimated people reached was 45,159. This represent 100% of the total targeted audience.

(2) The following is a list of education and outreach activities that will be conducted during the next reporting period including each high-priority water quality issue, the estimated number of people that will be reached, and an estimated percentage of the target audience or audiences that will be reached.

On 5/10/16 and 5/11/16 announcements were made for public input on selecting these education activities and high priorities. The announcements received 1216 and 1196 hits respectively. One public comment was received. The individual requested educating LaRC personnel further on green infrastructure around Center, and GIS tools available for identifying stormwater drains and drainage areas. Both of these topics will be promoted more in Permit Year 4 primarily under the TMDL Education high priority.

High Priority	Target Audience	Outreach Goal	Outreach Activities Planned - Permit Year 4 (July 1, 2016 – June 30, 2017)
Construction Site Erosion and Sediment Control (ESC) Best Management Practices (BMPs)	NASA employees and on site contractors involved in construction processes; FECs--150	50% of audience annually	Educational Article - 1 x year Environmental ESC BMP Flyer—Annual distribution SPEEB Environmental Website's Public Construction and ESC section –Reviewed, updated, and promoted via @LaRC 2x a year
Dumpster Maintenance: IDDE	General Center Population – 3000 FECs	25% of audience annually	Educational Article – 1 x year Standard Operating Procedure or Educational Flyer – Annual Distribution

High Priority	Target Audience	Outreach Goal	Outreach Activities Planned - Permit Year 4 (July 1, 2016 – June 30, 2017)
			SPEEB Environmental Website's Public IDDE Section - Reviewed, Updated and Promoted via @LaRC 2 x year
TMDL Education (Bay TMDL and LaRC's Action Plan)	General Employee Population – 3000	25% of audience annually	Educational Articles – 2 x year BMP education via posted signs –6 signs SPEEB Environmental Website's Public TMDL Website - Reviewed, Updated and Promoted via @LaRC 2 x year

Minimum Control Measure Two – Public Education and Participation
Annual Reporting Requirements - GP Section II B 2 (d)

(1) A web link to the MS4 Program Plan and annual report; and

(2) Documentation of compliance with the public participation requirements of this section.

(1) Web link to the primary public MS4 webpage where the Program Plans and Annual Reports can be viewed: https://environmental.larc.nasa.gov/water/ms4/

(2) Documentation of compliance with the public participation requirements of this section:

The following events were promoted on Center through promotion, sponsorship and/or involvement:

Hampton Roads 7th Go Green Expo – The VCE Peninsula Master Gardeners hosted the 7th Annual Go Green Expo on September 12th. The event provided education on sustainable gardening and hosted rain barrel workshops. LaRC promoted this event via the @LaRC announcement page. The announcements were posted on 8/31/15, 9/1/15, 9/2/15, 9/3/15, 9/4/15, and 9/11/15 with 7283, 7190, 7137, 7065, 7007, and 6605 visitors ("hits") respectively.

National Estuaries Week – Governor Terry McAuliffe proclaimed September 19-26, 2015 as National Estuaries Week in the Commonwealth of Virginia. LaRC advertised this event by providing education on the vital role of estuaries, and encouraging personnel to participate in local events. These events included beach clean-ups, hikes, canoe and kayak trips, workshops, and more. LaRC promoted this event via the @LaRC announcement page. The announcements were posted on 9/21/15, 9/22/15, 9/23/15, 9/24/15, and 9/25/15 with 6021, 5936, 5872, 5817, and 5762 visitors ("hits") respectively.

NASA Langley's Energy and Water Expo – LaRC held an on-Center Energy and Water Expo event on 10/14/15 in observance of Energy Action Month. The event featured several environmental education exhibits and displays from NASA Langley programs and local environmental groups. Exhibits featured information on Center programs for energy and water conservation, stormwater pollution prevention, and ways to conserve water at home. Participants were able to learn about rain barrels, green roofs, cisterns, sustainable building design, and more. The event had high attendance and were able to network and interact with exhibitors. The Expo was advertised on the @LaRC page and public environmental blog. Announcements were posted to @LaRC on 10/2/15, 10/5/15, 10/7/15, 10/9/15, 10/12/15, 10/13/15, and 10/14/15 with 5330, 5194, 5084, 4977, 4808, 4763, and 4727 visitors ("hits") respectively.

Newport News Rain Barrel Workshops – Newport News Waterworks partnered with the Newport News Master Gardeners, VA Cooperative Extension Office, and the Newport News Public Works to host several rain barrel making workshops. Rain barrel implementation has a positive effect on stormwater management and water conservation. LaRC received positive feedback from these events in the past and looks to continue supporting and promoting these workshops in the Hampton Roads community. LaRC promoted this event via posting to the @LaRC site. The announcement was posted on 10/16/15, 10/20/15, and 11/4/15 and received 4733, 4497, and 3677 "hits" (visitors) respectively.

Bluebird Gap Farm – Living Shoreline Project – The City of Hampton was seeking volunteers to help in creating 224 linear feet of living shoreline and planting 2,500 square feet of tidal marsh at Bluebird Gap Farm. The grant for this project is a focused effort by the Chesapeake Bay Foundation and local partners to

restore Hampton waterways. LaRC promoted this event via the @LaRC announcement page. The announcements were posted on 11/13/15, 11/17/15, 11/18/15, and 11/19/15 with 2930, 3041, 2918, and 2861 visitors ("hits") respectively.

Fallen Leaves and Waterways – askHRgreen.org is a local public awareness program of the 17 cities and counties of Hampton Roads, and encourages environmental stewardship among all residents. LaRC promoted an online quiz for individuals to test their knowledge on how autumn leaves should be handled in the yard, in order to have minimal impact to our local waterways. The quiz was advertised on the @LaRC site. The announcement was posted on 12/3/15 and 12/4/15 receiving 2376 and 2282 visitors ("hits") respectively.

Grasses for the Masses – Grasses for the Masses is a program hosted by the Chesapeake Bay Foundation. Participants grow grasses in their homes and then have the opportunity to help plant the grasses in a restoration site. LaRC advertised the benefits of underwater grasses and provided information on this program and upcoming workshops via the @LaRC announcement page and the public environmental blog. Announcements were posted on 12/21/15, 12/22/15, 12/23/15, 12/28/15, 12/29/15, and 12/30/15 with 1919, 1871, 1850, 1803, 1798, and 1779 visitors ("hits") respectively.

Ocean Friendly Gardening – The Norfolk Botanical Garden hosted a class for participants to learn how to garden for cleaner coasts and oceans. The class also covered techniques and practices to revive our watersheds in oceans, with presentation from Horticulturist Alexandra Cantwell and the Surfrider Foundation. LaRC promoted this event via the @LaRC announcement page. The announcements were posted on 1/7/16, 1/8/16, 1/11/16, 1/12/16, and 1/13/16 with 1700, 1663, 1631, 1616, and 1603 visitors ("hits") respectively.

Free Pruning Clinics – The York County/Poquoson Master Gardeners hosted several clinics that provided research-based pruning knowledge and practices that will help homeowners produce and maintain an attractive landscape, minimize plant disease, increase plant longevity, grow healthy plants, and enhance the look of home ornamental shrubs and small trees. These practices have a positive effect on stormwater management and water conservation. LaRC promoted this event via posting to the @LaRC site. The announcement was posted on 1/15/16, 1/18/16, 1/21/16, and 1/26/16 with 1740, 1444, 1432, and 1553 visitors ("hits") respectively.

LRNow Cleanup – Lynnhaven River NOW (LRN) works with the local community in restoring and protecting Virginia Beach waterways. LaRC advertised an opportunity to participate in a LRN Cleanup along the Lynnhaven Parkway/Potters Road in Virginia Beach. The event was promoted via the @LaRC announcement page on 2/8/16, 2/9/16, 2/10/16, 2/11/16, and 2/12/16. The announcements received 1346, 1330, 1320, 1314, and 1303 visitors ("hits") respectively.

2016 VPPSA Household Chemical Collection – The Virginia Peninsula Public Service Authority (VPPSA) holds household chemical, computer and electronics collections throughout the year. These events help to keep these types of products out of local waterways from improper disposal. LaRC promoted some of the collection events via the @LaRC announcement page and encouraged employees to attend their local municipality's event. LaRC promoted this event via posting to the @LaRC site. The announcements were posted on 3/7/16, 3/10/16, and 3/15/16 receiving 3855, 1891, and 1966 visitors ("hits") respectively.

Gardening Seminars – The Virginia Master Gardeners provided four different public seminars in the spring that focused on topics like lawn care and maintenance. Many of these topics were relevant to water quality and sustainable practices to prevent nutrient runoff. The event was promoted via the @LaRC announcement page and the public environmental blog, and also included reminder announcements on @LaRC before each seminar. Announcements to @LaRC were posted on 3/15/16, 3/16/16, 3/17/16,

4/20/16, 4/21/16, 5/18/16, 5/19/16, 6/15/16, and 6/16/16 with 1961, 1719, 1885, 1454, 1429, 1130, 1086, 767, and 751 visitors ("hits") respectively.

Great American Cleanup – The LaRC Environmental office posts an Environmental Tip each month (*Enviro-Tip of the Month*). For the month of April, the tip encouraged LaRC personnel to participate in the Great American Cleanup, the largest grassroots community involvement program in the United States. Local events across Hampton Roads included tree plantings, community cleanups, rain barrel workshops, and much more. LaRC promoted the Great American Cleanup events via the @LaRC announcement page and the public environmental log. Announcements to @LaRC were posted on 4/1/16, 4/4/16, 4/5/16, and 4/6/16 with 1457, 1628, 1421, and 1406 visitors ("hits") respectively.

HRSD York River Treatment Plant Tour – NASA Langley provided an opportunity for interested personnel to attend a tour of the Hampton Roads Sanitation District (HRSD) York River Treatment Plant on 4/20/2016. The HRSD York River Treatment Plant is designed to clean more than 15 million gallons of wastewater per day, and has received national awards for compliance with its environmental permits for more than 25 years. The tour was advertised on @LaRC and the public environmental blog. Announcements were posted on 4/11/16, 4/12/16, 4/13/16, 4/14/16, 4/15/16, 4/18/16, and 4/19/16 with 1544, 1348, 1325, 1500, 1304, 1261, and 1448 visitors ("hits") respectively.

NASA Langley's Main Earth Day/Arbor Day Event - LaRC held an on-Center Earth Day/Arbor Day event on 4/21/2016. The event featured over 13 environmental education exhibits and displays from several NASA Langley programs and local environmental groups. Exhibits featured information on Center programs for energy and water conservation, sustainable design including LaRC's Integrated Engineering Services Building, recycling, hazardous materials and waste management, stormwater pollution prevention, water and air quality, green purchasing, and cultural resources. The event had high attendance and guests were able to network and interact with exhibitors, participate in trivia games, and take home a plant for their office or garden. Promotion of this event was done on the @LaRC page and public environmental blog. The announcements were posted on 4/11/16, 4/12/16, 4/13/16, 4/14/16, 4/15/16, 4/18/16, 4/19/16, 4/20/16, and 4/21/16 receiving 1544, 1348, 1325, 1500, 1304, 1261, 2863, 2866, and 2836 visitors ("hits") respectively.

NASA Langley Plastic Bag Recycling – LaRC partnered with the York/Poquoson Master Gardeners to recycle plastic bags and film packaging. LaRC collected plastic bag material from Center personnel for 4 weeks in in observance of Earth Day and Arbor Day 2016. In total, 169 pounds of plastic material (estimated to be about 14,500 plastic bags) were collected and prevented from entering our local waterways and landfills. All plastic material was donated for a composite bench to be placed in a local learning garden. The event was advertised on the @LaRC page and public environmental blog. Announcements were posted to @LaRC on 4/20/16, 4/21/16, 4/22/16, 4/25/16, 4/26/16, 4/27/16, 4/28/16, 4/29/16, 5/2/16, 5/3/16, 5/4/16, 5/5/16, and 5/6/16 with 1428, 1409, 1405, 1375, 1294, 1403, 1357, 1137, 1317, 1271, 1064, 1235, and 1224 visitors ("hits") respectively.

Langley Air Force Base Shoreline Planting – NASA Langley partnered with the Langley Air Force Base on 4/19/16 and 4/20/16 to assist with a living shoreline project in observance of Earth Day 2016. LaRC advertised the event to volunteers interested in assisting with shoreline planting through the @LaRC page and public environmental blog. The advertisement also educated to personnel that living shorelines are important for protection from erosion, improving water quality, providing habitat, absorbing wave energy, and several other benefits. Announcements were posted 4/11/16, 4/12/16, 4/13/16, 4/14/16, 4/15/16, 4/18/16, 4/19/16, and 4/20/16 with 1544, 1348, 1325, 1500, 1304, 1261, 1448, and 1429 visitors ("hits") respectively.

NASA Langley's Sustainability Promises – During the week of Arbor Day 2016, LaRC invited personnel to visit a display outside of the cafeteria and to write a "sustainability promise" on a paper leaf. The paper

leaves were hung on a real tree for the NASA Langley community to see. This opportunity allowed LaRC personnel to consider how they could be more environmentally friendly in their daily activities. The tree, a Virginia native, was then planted outside of one of LaRC's LEED-Gold Certified buildings as a reminder of the sustainability promises made and to celebrate the important roles of trees in the environment and water quality. The event and results were advertised on @LaRC and the public environmental blog. Announcements were posted on 4/26/16, 4/27/16, 4/28/16, 5/2/16, 5/3/16, 5/4/16, 5/5/16, and 5/6/16 with 1329, 1338, 1330, 1295, 1266, 1067, 1231, and 1224 visitors ("hits") respectively.

Annual Clean the Bay Day - Clean the Bay Day is an annual stream and shoreline cleanup program where citizen volunteers come out to remove litter and debris from Virginia creeks, streams, rivers, and the Chesapeake Bay. This past year Langley Air Force Base (LAFB) did a large shoreline clean up and NASA LARC participated through promotion of the event. Last year, 141 total volunteers removed over 2,700 pounds of debris along 5 miles of Langley shoreline. LaRC promoted this event via the @LaRC announcement page. The announcements were posted on 6/1/16, 6/2/16, and 6/3/16 with 888, 904, and 872 "hits" (visitors) respectively. LaRC coordinated interested parties with the LAFB point of contact.

Additional documentation for these events can be found as an attachment to this Annual Report.

Minimum Control Measure Three – Illicit Discharge Detection and Elimination
Annual Reporting – GP Section II B 3 b

(1) A list of any written notifications of physical interconnection given by the operator to other MS4s;

(2) The total number of outfalls screened during the reporting period, the screening results, and detail of any follow-up actions necessitated by the screening results; and

(3) A summary of each investigation conducted by the operator of any suspected illicit discharge. The summary must include: (i) the date that the suspected discharge was observed, reported, or both; (ii) how the investigation was resolved, including any follow-up, and (iii) resolution of the investigation and the date the investigation was closed.

(1) Langley Air Force Base (LAFB) is the only downstream MS4 that LaRC has interconnection with. Joint Base Langley-Fort Eustis is comprised of two geographically separate entities: LAFB in Hampton and Fort Eustis in Newport News. LAFB's MS4 permit was issued in August 2016 (outside of the PY 3 reporting year). Fort Eustis has an MS4 permit; however, is not physically interconnected to NASA LaRC.

Generally, NASA LaRC and LAFB communicate regarding projects, NEPA Environmental Assessments, interconnections and possible project impacts. NASA LaRC provided some assistance to LAFB in preparing for their new MS4 permit. LaRC shared our MS4 Program Plan and past Annual Reports with LAFB to study. LaRC also gave feedback on MCM best management practices and an overview of our MCM 4 program.

(2) NASA LaRC has 16 MS4 outfalls. The total number of outfalls screened during the reporting period included all 16 outfalls. Outfall inspections occurred weekly (VPDES permit requirement) for a total of 420 total screenings spread across the 16 outfalls. These inspections are recorded in an electronic logbook and are kept on file with NASA Environmental.

Additionally, to best ensure MS4 permit compliance, LaRC completes an annual MS4 outfall screening of all 16 outfalls. This screening program utilizes a NASA developed MS4 screening form. The results of the specific MS4 screening program are summarized below:

Outfall ID	Date	Screening Result	Follow-up
001	11/30/15	No issues.	--
002	11/25/15	No issues.	Grounds Maintenance routinely removes sediment from the outfall discharge points and the concrete-lined ditch in this area. All sediment is removed and properly disposed of.
003	11/25/15	Minimal sheen in the Oil Water Separator (OWS). Absorbent pads in place (VPDES requirement) and	--

Outfall ID	Date	Screening Result	Follow-up
		water is clear at end of OWS. No concern.	
005	11/25/15	No issues.	--
006	11/25/15	Pipe 90% full of sediment. Natural iron bacterial sheen present and water is stagnant.	Maintenance review recommended. Evaluate area to transition to wetland.
007	11/25/15	No issues.	--
008	11/25/15	Outfall was redesigned in previous PY. Outfall is operating in great condition and is not showing signs of erosion. Some sediment buildup at splash pool.	Will monitor sediment buildup and recommend removal if it begins to impact performance of outfall structure.
009	11/25/15	Absorbent pads in place (VPDES requirement). Water is clear at end of OWS.	None
011	11/25/15	Pipe 30% full of sediment.	The sediment has not been removed in this area yet. It is a low finding priority because this outfall is dry 99% of the time. Recommendation made to convert this area to BMP.
012	11/25/15	No issues.	Grounds Maintenance routinely removes sediment from the outfall discharge points and the concrete-lined ditch in this area. All sediment is removed and properly disposed of.
014	11/25/15	No issues.	--
015	11/30/15	No issues.	--
016	11/25/15	Pipe 50% full of sediment.	The sediment has not been removed in this area yet. It is a low finding priority because this outfall is dry 99% of the time.
017	11/25/15	No issues.	--
018	11/25/15	No issues.	--
019	11/25/15	Concrete pipe has a broken section at the outfall point.	NASA received funding to repair pipe structure. In 02/16, Grounds Maintenance provided labor to remove/dispose of two broken 24” concrete pipe sections and backfilled the area. Sediment build-up was also cleaned up in remaining existing pipe and the ditch was minimally reshaped to allow flow.

3. The following is a summary of each investigation conducted by the operator of any suspected illicit discharge. The summary includes: (i) the date that the suspected discharge was observed, reported, or both; (ii) how the investigation was resolved, including any follow-up, and (iii) resolution of the investigation and the date the investigation was closed.

   A total of 3 illicit discharges were suspected and 3 were found to be illicit discharges.

Illicit Discharge Investigation #1: B1244 Floor Cleaner Discharge

(i) Date observed: 9/15/2015

(ii) How investigation was resolved, including follow-up: During a routine inspection of B1244, staff was alerted to floor-cleaner wastewater that was being disposed of in the parking lot storm drain. It was identified that about 40-50 gallons of wastewater was disposed after floor cleaning of the facility, which happened 1 – 2 times a month. Staff followed up with facility personnel and requested that the MSDS information on the floor cleaner be sent in for review. Environmental staff halted the operation and labeled the finding as an illicit discharge.

(iii) Resolution of the investigation: Facility personnel were told to stop discharging floor cleaning water until an adequate solution could be developed. Environmental staff worked with HRSD and received permission to discharge this wastewater to the sanitary sewer. Staff identified a convenient drain location to empty the wastewater through GIS tools and met with facility staff to go over the new drainage procedure. Environmental staff met with facility staff on 10/14/2016 to go over all new procedures. A closure email was sent on 10/16/2016. The investigation was closed on 10/14/2015.

Illicit Discharge Investigation #2: B1148 Metal Hopper

(i) Date observed: 11/10/2015

(ii) How investigation was resolved, including follow-up: Environmental Staff received a phone call at 12pm on 11/10/2015 about a potential sheen leaking from a metal recycling dumpster. There was a light rain, the hopper's lid was open, and it had a rusted/cracked corner that allowed water to drain out of the dumpster. Staff responded immediately and identified some oily debris (rags primarily) that were the source of the sheen. Staff identified that no sheen had discharged into the nearest storm drain, but that sheen could be seen in puddles in the parking lot. Staff immediately placed protective booms around the storm drain and oil absorbing pads on areas of sheen. The hopper lids were closed and the hopper was moved to a more appropriate area for repair.

(iii) Resolution of the investigation: The risk to the environment and eliminating the illicit discharge was mitigated fairly immediately by addressing the hopper and source material. The root cause was that inappropriate oily rags were placed in a metal recycling dumpster outside. NASA has a program to collect and properly dispose of oily rags inside buildings. This example has been included as a talking point in Annual Waste Training courses about why it is important to follow existing Center procedures. The investigation was closed on 11/10/2015.

Illicit Discharge Investigation #3: Concrete Washout in Dumpster

(i) Date observed: 5/19/2016

(ii) How investigation was resolved, including follow-up: During a routine inspection, an environmental inspector noted concrete washout had escaped from a 20-Cy dumpster on 5/19/2016. Pictures were taken of the issue and reported at 11:25 am. The team identified the contractor utilizing the dumpster and detailed the issue to the prime contractor in an

email on 5/19/2016 at 11:57 am. The contractor cleaned up the spilled washout later that day. No material was discharged to the MS4. Environmental staff noted to the contractor that concrete washout may be collected in a dumpster, but that the dumpster must be properly sealed/lined to avoid outflow.

(iii) Resolution of the investigation: The risk to the environment and eliminating the illicit discharge was mitigated fairly immediately by addressing the dumpster and source material. The root cause was that an inappropriate dumpster (rusted, holes, no liner bag) was used. The prime contractor discussed this with their subcontractor and featured this as a lessons learned in their subcontractor safety newsletter. They also discussed the issue at their next Construction Management (CM) meeting and Project Manager (PM) meeting. The investigation was closed on 5/20/2016.

Minimum Control Measure Four – Construction Site Stormwater Management
Annual Reporting - Section II B 4 (f)

The operator shall track regulated land-disturbing activities and submit the following information in all annual reports:

(1) Total number of regulated land-disturbing activities;

(2) Total number of acres disturbed;

(3) Total number of inspections conducted; and a summary of the enforcement actions taken, including the total number and type of enforcement actions taken during the reporting period.

(1) The total number of regulated LDAS during the reporting year was four.
- 1213/1192 Demo – VAR10G488
- ALDF Demolition – VAR10G584
- 1145/1231 Demolition – VAR10G966
- CRF Construction – VAR10G999

(2) The total number of acres disturbed was 11.55 acres.

(3) The total number of NASA (MS4 staff) inspections conducted was 122. The following is a summary of 12 issues that rose to the level of formal enforcement actions taken. All issues were closed once enforcement actions were taken. It should be noted that there were numerous minor issues noted in the field during the year. Per NASA Annual Standards and Specifications, for minor deficiencies with no environmental impacts the contractor may remedy the violation immediately and avoid a formal enforcement action (such as a signed *Corrective Action Notice or contract action)* being issued. Only issues that needed formal "enforcement" are reported below:

Project	# of Enforcement Actions	Type of Enforcement	Issues Driving the Enforcement
VAR10G488	0	No issues.	- Only very minor maintenance issues noted (like cleaning a drop inlet protection). No formal enforcement taken – issues were either corrected onsite or done within requested period.
VAR10G584	6	Formal written Corrective Action Notices submitted to the contractor and project team	- Location of SWPPP and contact info not posted.

Project	# of Enforcement Actions	Type of Enforcement	Issues Driving the Enforcement
			- ESC BMPs (including inlet protection) not installed or not in accordance with approved SWPPP - Silt fence repair needed due to sediment undercutting (asked more than once for repair) - Temporary and/or permanent stabilization not applied in specified time or was ineffective and was not inhibiting erosion - Controls pulled without NASA approval - Sediment tracking onto roadways
VAR10G966	1	Formal written Corrective Action Notice submitted to the contractor and project team	- Temporary and/or permanent stabilization not applied in specified time or was ineffective and was not inhibiting erosion. Site had been dormant at grade for >14 days
VAR10G999	5	Formal written Corrective Action Notice submitted to the contractor and project team	- Dewatering without proper controls (not in accordance with approved SWPPP) - Sediment tracking onto roadways - Temporary and/or permanent stabilization not applied in specified time or was ineffective and was not inhibiting erosion. - Inlet protection was missing and/or needed maintenance - Concrete washout maintenance needed - Non-compliant construction entrance (asked more than once for compliance). Entrance was not constructed to specs and not identified in SWPPP. - Sediment-laden flow leaving site via storm inlet. Protection not providing adequate filtration.

Minimum Control Measure Five – Post Construction
Annual Reporting - Section II B 5 e

(1) The stormwater management facility type;
(2) A general description of the facility's location, including the address or latitude and longitude;
(3) The acres treated by the facility, including total acres, as well as the breakdown of pervious and impervious acres;
(4) The date the facility was brought online (MM/YYYY). If the date is not known, the operator shall use June 30, 2005, as the date brought online for all previously existing stormwater management facilities;
(5) The sixth order hydrologic unit code (HUC) in which the stormwater management facility is located;
(6) The name of any impaired water segments within each HUC listed in the 2010 § 305(b)/303(d) Water Quality Assessment Integrated Report to which the stormwater management facility discharges;
(7) Whether the stormwater management facility is operator-owned or privately-owned;
(8) Whether a maintenance agreement exists if the stormwater management facility is privately owned; and
(9) The most recent inspection of the stormwater management facility.

Per Guidance from DEQ's Jaime Bauer, DEQ's new BMP Warehouse application can be used to meet this annual reporting requirements. NASA LaRC submitted information via the application for this year's report. The approved submission was labeled as 20160831.

Minimum Control Measure 6 – Pollution Prevention/Good Housekeeping
Annual Reporting - Measurable Goals - GP Section II B 6 g

(1) A summary report on the development and implementation of the daily operational procedures;

(2) A summary report on the development and implementation of the required SWPPPs;

(3) A summary report on the development and implementation of the turf and landscape nutrient management plans that includes:

(a) The total acreage of lands where turf and landscape nutrient management plans are required; and

(b) The acreage of lands upon which turf and landscape nutrient management plans have been implemented; and

(4) A summary report on the required training, including a list of training events, the training date, the number of employees attending training and the objective of the training.

(1) LaRC was required to complete the development and implementation of written procedures designed to minimize or prevent pollution within 24-months of permit coverage. LaRC has completed this task. Operational procedures and good housekeeping practices have been summarized in the Program Plan and written descriptions of how the work is accomplished has been included. The updated Program Plan goes into more specific detail on LaRC's programs and procedures for street sweeping, ditch and outfall maintenance, equipment maintenance, salt storage, outfall maintenance (booms, pads, etc.), catch basin maintenance, leaf collection, spill containment, and application, storage, transport and disposal of pesticides, herbicides, and fertilizers.

(2) NASA LaRC has assessed all facilities on Center for their potential of discharging pollutants. In general, LaRC has a low risk for facilities discharging pollutants due to current procedures in place and LaRC's practice of material storage with no exposure to stormwater. Additionally, many facilities that would be covered under this MCM are already covered under LaRC's VPDES Permit #VA0024741 or LaRC's General VPDES Permit for Vehicle Wash Facilities (VAG750198). Facilities covered under a separate VPDES permit shall adhere to the conditions established in that permit and are excluded from this requirement. LaRC only identified one (1) area as high priority, which is the composting facility/grounds maintenance area.

The Center operates an informal composting area and landscape material storage area in the fields near Building 1285. This area is primarily used for storing mulch and sand and well as for composting leaves and other landscaping debris (gumballs, small branches, etc.). The area selected is surrounded by grass and has no storm inlets or ditches nearby. The potential for any stormwater runoff is limited; however, this area could be improved. Additionally, LaRC is interested in expanding its composting operation, so the risk to the MS4 could grow. LaRC will develop and implement a specific stormwater pollution prevention plan (SWPPP) for this high priority facility. LaRC will development and implement this SWPPP within 48 months of coverage as required by Table 1.

(3) LaRC will continue to strictly limit the use of nutrients and fertilizer application on pervious turf areas. LaRC's policy regarding the use of pesticides, herbicides and fertilizers is to follow Integrated Pest Management (IPM) practices whenever possible and to use the absolute minimum amount of pesticides, herbicides, and fertilizers on Center as necessary. LaRC has no applicable lands where nutrients are applied to a contiguous area of more than 1 acre. The total acreage of

lands where turf and landscape nutrient management plans apply is zero. The acreage of lands upon which turf and landscape nutrient management plans have been implemented is zero.

(4) The following is a summary of completed training during the last PY:

Training Requirement	Applicable Audience(s)	Summary
Training for applicable field personnel in the recognition and reporting of illicit discharges	Facility Environmental Coordinators	FECs are asked to monitor their facilities for illicit discharge concerns and are the primary "eyes and ears" for the Environmental Branch. The FEC training course goes into detail about stormwater pollution prevention and the importance of LaRC's IDDE program. It also discussed how to make proper reports to NASA Environmental. FEC training was held on 7/15/15, 7/22/15, 5/18/16, and 6/14/16 with 27, 12, 24, and 10 attendees respectively. A total of 73 FECs were trained. All FECs are also required to attend the Annual Waste Management and Spill Response Training. This annual training is mandatory for all Center employees that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains. The training was held on 7/16/15, 7/23/15, 6/7/16, and 6/8/16, and all FECs are required to attend one of the training sessions.
	Standard Practice and Environmental Engineering Branch (SPEEB) employees and Jacobs (primary Center contractor) Personnel	A special training session, titled *Awareness of Environmental Issues: Common Water and Waste Concerns at Construction Sites* was held on 8/11/15 with 9 attendees. This training was targeted towards Jacobs personnel and personnel within the Facility Assurance, Inspection, Maintenance, & Occupational Safety Support Services (FAIMOS) contract at NASA Langley. The training focused how to prevent, recognize, and report illicit discharges at construction sites and facility maintenance projects. Topics covered included proper procedures for concrete washout, dewatering, outside storage of chemicals, secondary containment, dirt tracking from vehicles, and good housekeeping. A special training session, titled *Recognizing and Reporting Stormwater Pollution,* was held on

Training Requirement	Applicable Audience(s)	Summary
		Center 6/7/16 with 3 participants. This training educated personnel on how to recognize illicit discharges, including spills and illegal dumping, and how to report an illicit discharge at NASA Langley. Attendees also learned the impact illegal dumping has on the Chesapeake Bay, and how to prevent stormwater pollution from occurring by identifying best management practices they can follow. During the month of March 2016, individual IDDE training sessions were held with upper management of field personnel, including Jacobs personnel. The groups were also provided with laminated posters to be placed in facilities with guidelines on how to recognize and report illicit discharges. 3 posters were provided to Jacobs personnel.
	Personnel who handle waste on Center.	Annual Waste Management and Spill Response Training. This annual training is mandatory for all Center employees that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains. The training was held on 7/16/15, 7/23/15, 6/7/16, and 6/8/16, with 130, 18, 153, and 164 attendees respectively.
Training for applicable employees in good housekeeping and pollution prevention practices that are to be employed during road, street, and parking lot maintenance	Grounds Maintenance Contractor	During the month of March 2016, individual IDDE training sessions were held with upper management of field personnel, including Grounds Maintenance personnel. The groups were also provided with laminated posters to be placed in facilities with guidelines on how to recognize and report illicit discharges. 2 posters were provided to Grounds Maintenance personnel. The poster and individualized training covered maintenance and sweeping of roads, streets, and parking lots.
Training for applicable employees in good housekeeping and pollution prevention practices that are to be employed in and	Facility Environmental Coordinators	Certain FECs are employed to manage “public works-type” facilities on Center. The FEC training course goes into detail about stormwater pollution prevention and the importance of good housekeeping principles in and around facilities.

Training Requirement	Applicable Audience(s)	Summary
around maintenance and public works facilities.		FEC training was held on 7/15/15, 7/22/15, 5/18/16, and 6/14/16 with 27, 12, 24, and 10 attendees respectively. A total of 73 FECs were trained.
	Jacobs (primary Center contractor) Personnel	A special training session, titled *Awareness of Environmental Issues: Common Water and Waste Concerns at Construction Sites* was held on 8/11/15 with 9 attendees. This training was targeted towards Jacobs personnel and personnel within the Facility Assurance, Inspection, Maintenance, & Occupational Safety Support Services (FAIMOS) contract at NASA Langley. The training focused how to prevent, recognize, and report illicit discharges at construction sites and facility maintenance projects. Topics covered included proper procedures for concrete washout, dewatering, outside storage of chemicals, secondary containment, dirt tracking from vehicles, and good housekeeping.
Ensure that employees, and require that contractors, who apply pesticides and herbicides are properly trained or certified in accordance with the Virginia Pesticide Control Act (§ 3.2-3900 et seq. of the Code of Virginia).	Grounds Maintenance Contractor	The Grounds Maintenance Contractor is responsible for the minor amounts of pesticides and herbicides applied on Center. The program is primarily need-based and done via spot treatments (ex. Someone calls in a wasp nest to be sprayed). NASA has required, through specific contract language, that the Grounds contract operator carry all necessary state licenses. This contract language ensures that this requirement is met or the operator can't work at NASA LaRC.
Ensure that employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as required under the Virginia Erosion and Sediment Control Law	Standard Practice and Environmental Engineering Branch (SPEEB)	Mr. Peter Van Dyke serves as LaRC's Water Program Manager. Mr. Van Dyke is in charge of all ESC and SWM Plan reviews and inspection programs. Mr. Van Dyke has both ESC and SWM Combined Administrator certifications. Dual Combined Administrator #DCA0184 (Expires 4-17-2018) Mrs. Ande Remington provides contract support to LaRC's Water Program Manager. Mrs. Remington is a provisionally certified SWM Combined Administrator and ESC Combined Administrator.

Training Requirement	Applicable Audience(s)	Summary
Training for applicable employees in good housekeeping and pollution prevention practices that are to be employed in and around recreational facilities.	Facility Environmental Coordinators	LaRC has very limited recreational facilities due to our small size. There are a few ball/soccer fields and tennis court areas, but no nutrients are applied. However, LaRC reviews good housekeeping and pollution prevention practices around Center, including these facilities, during annual FEC training. FEC training was held on 7/15/15, 7/22/15, 5/18/16, and 6/14/16 with 27, 12, 24, and 10 attendees respectively. A total of 73 FECs were trained.
Emergency response employees shall have training in spill responses.	Waste Handling Center Personnel	Annual Waste Management and Spill Response Training was held on 7/16/15, 7/23/15, 6/7/16, and 6/8/16 with 130, 18, 153, and 164 attendees. This annual training is mandatory for all Center employees that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains. A total of 465 personnel were trained.

Section One Special Condition - Chesapeake Bay TMDL

Annual Reporting - GP Section I C 4

a. In accordance with Table 1, the operator shall submit the Chesapeake Bay Action Plan with the appropriate annual report.

b. Each subsequent annual report shall include a list of control measures implemented during the reporting period and the cumulative progress toward meeting the compliance targets for nitrogen, phosphorus, and total suspended solids.

c. Each subsequent annual report shall include a list of control measures, in an electronic format provided by the department, that were implemented during the reporting cycle and the estimated reduction achieved by the control. For stormwater management controls, the report shall include the information required in Section II B 5 e and shall include whether an existing stormwater management control was retrofitted, and if so, the existing stormwater management control type retrofit used.

d. Each annual report shall include a list of control measures that are expected to be implemented during the next reporting period and the expected progress toward meeting the compliance targets for nitrogen, phosphorus, and total suspended solids.

a. The Chesapeake Bay TMDL Action Plan was submitted with the Year 2 Annual Report as required. The Plan was reviewed and approved by DEQ's Allan Brockenbrough in a letter dated 12/11/215.

b. The following is a list of control measures implemented during Year 3 and a summary of progress:

- The Action Plan had proposed three land-use change BMPs of impervious to grass credit. All three of these projects, totaling 5.28 acres, were implemented during the PY. In total, these projects achieved reductions of 32.00 lbs TN/yr, 6.18 lbs of TP/yr and 2270.40 lbs of TSS/yr.
- The Action Plan proposed one land use change BMP of pervious to forest. This project was completed during the PY. A one (1) acre grass area was converted to a forested condition by planting 466 hardwood tree seedlings. In total, this project achieved reductions of 5.18 lbs TN/yr, 0.40 lbs of TP/yr and 78.30 lbs of TSS/yr. Additionally, this project can be credited as a forest buffer and earn the efficiency credit. An additional load reduction of 3.88 lbs TN/yr, 0.46 lbs of TP/yr and 72.28 lbs of TSS/yr was achieved (as listed in the Action Plan).
- The Action Plan proposed continuation of the street sweeping program, which is taking the annual mass load credit. This project was implemented during the PY.

Cumulative Progress Report end of PY3:

Sub source	Pollutant	Load (lbs) Reduction Required by end of Permit	Load (lbs) Reduction Achieved at end of PY3	Total Load (lbs) Reduction Planned
Regulated Urban Impervious	TN	7.16	224.35	237.32
Regulated Urban Pervious		5.76	13.36	31.48
Regulated Urban Impervious	TP	2.63	28.98	80.57
Regulated Urban Pervious		.46	1.36	3.08
Regulated Urban Impervious	TSS	994.01	24192.75	25112.95
Regulated Urban Pervious		79.85	226.00	526.56

c. NASA LaRC reported under DEQ's new BMP Warehouse application to meet the annual reporting requirements. The approved submission was labeled as 20160831.

d. The following is a list of control measures expected to be implemented during PY4 and a summary of expected progress:

- Two land-use changes removing1.59 acres of impervious surface and converting to a grass condition are planned for PY4.
- LaRC will continue the street sweeping program, annual mass load credit approach, during PY4.

Cumulative Progress Report for end of PY4:

Sub source	Pollutant	Load (lbs) Reduction Required by end of Permit	Load (lbs) Reduction Planned at end of PY4	Total Load (lbs) Reduction Planned
Regulated Urban Impervious	TN	7.16	233.99	237.32
Regulated Urban Pervious		5.76	13.36	31.48
Regulated Urban Impervious	TP	2.63	30.96	80.57
Regulated Urban Pervious		.46	1.36	3.08
Regulated Urban Impervious	TSS	994.01	24876.45	25112.95
Regulated Urban Pervious		79.85	226.00	526.56

Program Plan Modifications Summary

LaRC has updated the MS4 Program Plan in compliance with the General Permit. All of the necessary 36-month updates listed in Table 1 of the General Permit have been addressed. Implementation of the new Program Plan began on July 1, 2016. Below if a snapshot of Program Plan updates:

36-Month MS4 Program Plan Update Summary		
Program Update Requirement	*Permit Reference*	*Update Summary*
Updated TMDL Action Plans (TMDLs approved between July 2008 and June 2013) – (Special Conditions for Approved Total Maximum Daily Loads (TMDL) Other Than Chesapeake Bay)	Section I B	LaRC currently has no waste load reductions associated with any TMDLs except the Chesapeake Bay TMDL. A previous TMDL for the Back River (Bacteria) has been pulled back, revised, and reissued. The final TMDL did not assign a WLA to NASA LaRC due to a lack of sources as indicated in the final study. No updated TMDL action plans are required at this time (aside from the Chesapeake Bay TMDL).

MCM 1 - Three new high priorities have been selected and an associated education and training plan was developed. LaRC moved away from existing MCMs serving as high priorities, and selected more targeted priorities. The three priorities for Year 4 are: (1) Construction Site Erosion and Sediment Control (ESC) Best Management Practices (BMPs); (2) Dumpster Maintenance: Illicit Discharge Detection and Elimination; and (3) the Chesapeake Bay TMDL and LaRC's TMDL Action Plan. Prior to developing the Permit Year 4 Annual Outreach Plan, LaRC solicited public comment via the employee @LaRC announcement system. Notices ran on 5/10/16 and 5/11/16. The call asked employees what they felt were the most pressing stormwater issues the Center faced and where NASA Environmental should focus educational efforts. One public comment was received. The individual requested educating LaRC personnel further on green infrastructure around Center, and GIS tools available for identifying stormwater drains and drainage areas. Both of these topics will be promoted more in Permit Year 4.

MCM 2 - This section of the Program Plan had no significant changes. The Program Plan was updated to list more possible local opportunities for public involvement.

MCM 3 – This section of the Program Plan was updated to note several improvements LaRC has taken in stormwater mapping through the GIS system. A link for the base stormwater map layer was provided, and LaRC is on track to meet the requirement to have a complete and updated storm sewer system map and information table within 48 months of permit coverage.

MCM 4 – This section of the Program Plan was streamlined and referenced sections from the NASA Environmental Master Specifications attachment, rather than placing excerpts in the Program Plan text. Mrs. Andrea Remington became provisionally certified as an ESC and SWM Inspector and Plan Reviewer during the PY, and will be receiving certification after completing the appropriate exams. Mrs. Remington's information was updated in the Program Plan.

MCM 5 – This section of the Program Plan had no significant changes outside of updating the spreadsheet for new permanent stormwater facilitates that came on-line during the PY.

MCM 6 – Multi-media Environmental Audits were included in the section on Daily Operations Pollution Prevention and Good Housekeeping Program. LARC is committed to doing 40 of these a year. A new training plan and schedule was also incorporated into the Program Plan.

Special Condition/Chesapeake Bay TMDL Action Plan – Two minor changes to the Action Plan are requested:

(1) One of the actions proposed in PY4 was to demolish B1222 and covert the 0.55 acres to a grass condition. One of the proposed actions in PY5 was to demolish B1275 and convert the 1.0 acre to a grass condition. For funding reasons, these projects will be switched – B1275 will occur in PY4 and B1222 will occur in PY5. There is no net increase or decrease in pollutant load reductions. The requested change is only to adjust the anticipated PY for each project.

(2) During PY4, it was anticipated that 2.0 acres of grass would be converted into a forested condition. This action is being requested to move into PY5. The reason is primarily a timing issue – planting the seedlings is best done over late fall or winter. This winter our Grounds Maintenance staff are being inundated with requests to prepare for our 2017 Centennial celebrations. Grounds Maintenance staff would not be able to complete the reforestation project until spring 2017. NASA would rather wait under the fall/winter of 2017 (PY5) to plant the seedlings. Again, there is no net increase or decrease in pollutant load reductions. The requested change is only to adjust the anticipated PY for the project.

Signed Certification Statement

"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."

Kristen Poultney 9/28/16

Kristen Poultney, Environmental Branch Head — Date

VAR040092 — NASA Langley Research Center

Permit Number — MS4 Name

MS4 AR 3, Cycle III
NASA Langley Research Center
MCM2: Public Participation Additional Documentation

Figure 1 The NASA Langley Earth Day and Arbor Day event on 4/21/2016 featured over 13 environmental education exhibits. Guests were able to interact with exhibitors, participate in trivia games, and learn about several environmental topics, including stormwater pollution prevention.

Figure 2 NASA Langley's Energy and Water Expo event on 10/14/2015 featured several environmental exhibits from NASA Langley programs and local environmental groups. Participants were able to learn about rain barrels, green roofs, cisterns, sustainable building design, and more.

Figure 3 NASA Langley partnered with the Langley Air Force Base (LAFB) to assist with a living shoreline project. Volunteers learned why living shorelines are significant, and were able to help plant over 3,000 shoreline plants on LAFB property.

Figure 4 NASA Langley provided an opportunity for interested personnel to attend a tour of the Hampton Roads Sanitation District (HRSD) York River Treatment Plant on 4/20/16. The plant is designed to clean more than 15 million gallons of wastewater per day, and has received national awards for its sustainability practices.

Figure 5 Five new trees were planted in observance of Earth Day and Arbor Day 2016. These trees are Virginia natives, and will provide shade and wind protection to the nearby daycare facility.

Figure 6 During the week of Arbor Day 2016, LaRC invited personnel to share a "sustainability promise" on a paper leaf. The promises were hung on a real tree for the LaRC community to see. The tree, an Eastern Redbud, was planted on Arbor Day as a reminder of the sustainability promises made, and to celebrate the important roles of trees in the environment and improving water quality.

Figure 7 NASA Langley has maintained designation as a Tree City USA "community" for 6 years. LaRC strives to maintain a healthy, sustainable urban forestry program on Center in order to decrease the amount of pervious surfaces and reduce costs for energy, stormwater management, and erosion control.

Stormwater Related Posts on @LaRC

All Posts By Andrea Remington and Peter Van Dyke 7/1/15-6/30/16

Publish Date	Title	Approved?	Published?	Visits
6-30-2016	What Can You Do To Prevent An Illicit Discharge?	APPROVED	PUBLISHED	547
6-29-2016	What Can You Do To Prevent An Illicit Discharge?	APPROVED	PUBLISHED	575
6-28-2016	What Can You Do To Prevent An Illicit Discharge?	APPROVED	PUBLISHED	556
6-17-2016	Plastic Bag Recycling Results	APPROVED	PUBLISHED	718
6-16-2016	Local Event: Gardening Seminar June 16th	APPROVED	PUBLISHED	751
6-16-2016	Plastic Bag Recycling Results	APPROVED	PUBLISHED	723
6-15-2016	Local Event: Gardening Seminar June 16th	APPROVED	PUBLISHED	767
6-15-2016	Plastic Bag Recycling Results	APPROVED	PUBLISHED	740
6-14-2016	Plastic Bag Recycling Results	APPROVED	PUBLISHED	581
6-13-2016	Plastic Bag Recycling Results	APPROVED	PUBLISHED	832
6-3-2016	Clean the Bay Day June 4th	APPROVED	PUBLISHED	872
6-2-2016	Clean the Bay Day June 4th	APPROVED	PUBLISHED	904
6-1-2016	Clean the Bay Day June 4th	APPROVED	PUBLISHED	888
5-19-2016	Local Event: Gardening Seminar May 19th	APPROVED	PUBLISHED	1086
5-18-2016	Local Event: Gardening Seminar May 19th	APPROVED	PUBLISHED	1130
5-11-2016	Employee Input Needed on Outreach Development	APPROVED	PUBLISHED	1196
5-10-2016	Employee Input Needed on Outreach Development	APPROVED	PUBLISHED	1216
5-6-2016	PLASTIC BAG RECYCLING CONTINUES! May 2-6	APPROVED	PUBLISHED	1224
5-6-2016	Your Sustainability Promises and a New Tree at LaRC!	APPROVED	PUBLISHED	1224
5-5-2016	Enviro-Tip Of The Month: Do You Need To Attend Waste Training?	APPROVED	PUBLISHED	1235
5-5-2016	PLASTIC BAG RECYCLING CONTINUES! May 2-6	APPROVED	PUBLISHED	1235
5-5-2016	Your Sustainability Promises and a New Tree at LaRC!	APPROVED	PUBLISHED	1231
5-4-2016	Enviro-Tip Of The Month: Do You Need To Attend Waste Training?	APPROVED	PUBLISHED	1058
5-4-2016	PLASTIC BAG RECYCLING CONTINUES! May 2-6	APPROVED	PUBLISHED	1064
5-4-2016	Your Sustainability Promises and a New Tree at LaRC!	APPROVED	PUBLISHED	1067
5-3-2016	Enviro-Tip Of The Month: Do You Need To Attend Waste Training?	APPROVED	PUBLISHED	1257
5-3-2016	PLASTIC BAG RECYCLING CONTINUES! May 2-6	APPROVED	PUBLISHED	1271
5-3-2016	Your Sustainability Promises and a New Tree at LaRC!	APPROVED	PUBLISHED	1266
5-2-2016	Enviro-Tip Of The Month: Do You Need To Attend Waste Training?	APPROVED	PUBLISHED	1268
5-2-2016	PLASTIC BAG RECYCLING CONTINUES! May 2-6	APPROVED	PUBLISHED	1317
5-2-2016	Your Sustainability Promises and a New Tree at LaRC!	APPROVED	PUBLISHED	1295
4-29-2016	LAST DAY of Plastic Bag Recycling!	APPROVED	PUBLISHED	1137
4-28-2016	Arbor Day Promise Tree This Week!	APPROVED	PUBLISHED	1330
4-28-2016	Tomorrow is the LAST DAY for Plastic Bag Recycling!	APPROVED	PUBLISHED	1357
4-27-2016	Arbor Day Promise Tree This Week!	APPROVED	PUBLISHED	1338
4-27-2016	Keep Bringing In Plastic Bags for Recycling!	APPROVED	PUBLISHED	1403
4-26-2016	Arbor Day Promise Tree This Week!	APPROVED	PUBLISHED	1329
4-26-2016	Keep Bringing In Your Plastic Bags For Recycling!	APPROVED	PUBLISHED	1294
4-25-2016	From Bags to Benches!	APPROVED	PUBLISHED	1375
4-22-2016	From Bags to Benches!	APPROVED	PUBLISHED	1405
4-21-2016	Local Event: Gardening Seminar April 21st	APPROVED	PUBLISHED	1429
4-21-2016	From Bags to Benches!	APPROVED	PUBLISHED	1409
4-21-2016	Earth Day Celebration TODAY! 11am-1pm in IESB	APPROVED	PUBLISHED	1424
4-21-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1412
4-20-2016	Local Event: Gardening Seminar April 21st	APPROVED	PUBLISHED	1454
4-20-2016	From Bags to Benches!	APPROVED	PUBLISHED	1428
4-20-2016	Earth Day Celebration TOMORROW!	APPROVED	PUBLISHED	1437
4-20-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1429
4-19-2016	Earth Day Celebration on the 21st!	APPROVED	PUBLISHED	1415
4-19-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1448
4-18-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1261
4-15-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1304
4-14-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1500
4-13-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1325
4-12-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1348

4-11-2016	All Events for Earth Day and Arbor Day 2016	APPROVED	PUBLISHED	1544
4-8-2016	LaRC Named a Tree City USA Facility	APPROVED	PUBLISHED	1399
4-7-2016	LaRC Named a Tree City USA Facility	APPROVED	PUBLISHED	1589
4-6-2016	Enviro-Tip of the Month: Get Involved!	APPROVED	PUBLISHED	1406
4-6-2016	LaRC Named a Tree City USA Facility	APPROVED	PUBLISHED	1445
4-5-2016	Enviro-Tip of the Month: Get Involved!	APPROVED	PUBLISHED	1421
4-4-2016	Enviro-Tip of the Month: Get Involved!	APPROVED	PUBLISHED	1628
4-1-2016	Enviro-Tip of the Month: Get Involved!	APPROVED	PUBLISHED	1457
4-1-2016	Spring is here! Car Washing Tips	APPROVED	PUBLISHED	1503
4-1-2016	If You Use a Pressure Washer at LaRC...	APPROVED	PUBLISHED	1478
3-31-2016	Spring is here! Car Washing Tips	APPROVED	PUBLISHED	1519
3-31-2016	If You Use a Pressure Washer at LaRC...	APPROVED	PUBLISHED	1510
3-30-2016	Spring is here! Car Washing Tips	APPROVED	PUBLISHED	1564
3-30-2016	If You Use a Pressure Washer at LaRC...	APPROVED	PUBLISHED	1525
3-29-2016	Spring is here! Car Washing Tips	APPROVED	PUBLISHED	1834
3-29-2016	If You Use a Pressure Washer at LaRC...	APPROVED	PUBLISHED	1773
3-25-2016	New Trees for Earth Day and Arbor Day!	APPROVED	PUBLISHED	1769
3-24-2016	New Trees for Earth Day and Arbor Day!	APPROVED	PUBLISHED	1599
3-23-2016	New Trees for Earth Day and Arbor Day!	APPROVED	PUBLISHED	1667
3-17-2016	Local Events: Gardening Seminars	APPROVED	PUBLISHED	1885
3-16-2016	Local Events: Gardening Seminars	APPROVED	PUBLISHED	1719
3-15-2016	Local Events: Gardening Seminars	APPROVED	PUBLISHED	1961
3-15-2016	2016 VPSSA Household Chemical Collection	APPROVED	PUBLISHED	1966
3-10-2016	2016 VPSSA Household Chemical Collection	APPROVED	PUBLISHED	1891
3-9-2016	Help LaRC Stay in Compliance!	APPROVED	PUBLISHED	1866
3-8-2016	Help LaRC Stay in Compliance!	APPROVED	PUBLISHED	2080
3-7-2016	Help LaRC Stay in Compliance!	APPROVED	PUBLISHED	1953
3-7-2016	2016 VPSSA Household Chemical Collection	APPROVED	PUBLISHED	1967
3-7-2016	2016 VPSSA Household Chemical Collection	APPROVED	PUBLISHED	1888
2-12-2016	Local Event: LRNow Cleanup Feb 13th	APPROVED	PUBLISHED	1303
2-11-2016	Local Event: LRNow Cleanup Feb 13th	APPROVED	PUBLISHED	1314
2-10-2016	Local Event: LRNow Cleanup Feb 13th	APPROVED	PUBLISHED	1320
2-9-2016	Local Event: LRNow Cleanup Feb 13th	APPROVED	PUBLISHED	1330
2-8-2016	Local Event: LRNow Cleanup Feb 13th	APPROVED	PUBLISHED	1346
1-26-2016	Free Pruning Clinics	APPROVED	PUBLISHED	1553
1-21-2016	Free Pruning Clinics	APPROVED	PUBLISHED	1432
1-18-2016	Free Pruning Clinics	APPROVED	PUBLISHED	1444
1-15-2016	Free Pruning Clinics	APPROVED	PUBLISHED	1740
1-13-2016	Ocean Friendly Gardening Jan 13th	APPROVED	PUBLISHED	1603
1-12-2016	Ocean Friendly Gardening Jan 13th	APPROVED	PUBLISHED	1616
1-11-2016	Ocean Friendly Gardening Jan 13th	APPROVED	PUBLISHED	1631
1-8-2016	Ocean Friendly Gardening Jan 13th	APPROVED	PUBLISHED	1663
1-7-2016	Ocean Friendly Gardening Jan 13th	APPROVED	PUBLISHED	1700
12-30-2015	Grasses for the Masses	APPROVED	PUBLISHED	1779
12-29-2015	Grasses for the Masses	APPROVED	PUBLISHED	1798
12-28-2015	Grasses for the Masses	APPROVED	PUBLISHED	1803
12-23-2015	Grasses for the Masses	APPROVED	PUBLISHED	1850
12-22-2015	Grasses for the Masses	APPROVED	PUBLISHED	1871
12-21-2015	Grasses for the Masses	APPROVED	PUBLISHED	1919
12-21-2015	Educational Presentation on the Chesapeake Bay	APPROVED	PUBLISHED	1884
12-17-2015	Educational Presentation on the Chesapeake Bay	APPROVED	PUBLISHED	1815
12-16-2015	Educational Presentation on the Chesapeake Bay	APPROVED	PUBLISHED	1839
12-15-2015	Educational Presentation on the Chesapeake Bay	APPROVED	PUBLISHED	1867
12-11-2015	The Chesapeake Bay's "Diet"	APPROVED	PUBLISHED	1950
12-10-2015	The Chesapeake Bay's "Diet"	APPROVED	PUBLISHED	1968
12-9-2015	The Chesapeake Bay's "Diet"	APPROVED	PUBLISHED	2068
12-8-2015	The Chesapeake Bay's "Diet"	APPROVED	PUBLISHED	1987
12-4-2015	Test your knowledge about fallen leaves!	APPROVED	PUBLISHED	2282
12-3-2015	Test your knowledge about fallen leaves!	APPROVED	PUBLISHED	2376
11-19-2015	Local Volunteer Activity at Blue Bird Gap Farm - Living Shoreline Project	APPROVED	PUBLISHED	2861
11-18-2015	Local Volunteer Activity at Blue Bird Gap Farm - Living Shoreline Project	APPROVED	PUBLISHED	2918

11-17-2015	Local Volunteer Activity at Blue Bird Gap Farm - Living Shoreline Project	APPROVED	PUBLISHED	3041
11-13-2015	Local Volunteer Activity at Blue Bird Gap Farm - Living Shoreline Project	APPROVED	PUBLISHED	2930
11-4-2015	Rain Barrel Workshops	APPROVED	PUBLISHED	3677
10-20-2015	Rain Barrel Workshops	APPROVED	PUBLISHED	4497
10-16-2015	Rain Barrel Workshops	APPROVED	PUBLISHED	4733
10-14-2015	Stormwater Annual Report submitted to VADEQ	APPROVED	PUBLISHED	4744
10-13-2015	Stormwater Annual Report submitted to VADEQ	APPROVED	PUBLISHED	4798
9-25-2015	Happy National Estuaries Week!	APPROVED	PUBLISHED	5762
9-25-2015	How to have a Healthy Lawn	APPROVED	PUBLISHED	5802
9-24-2015	Happy National Estuaries Week!	APPROVED	PUBLISHED	5817
9-24-2015	How to have a Healthy Lawn	APPROVED	PUBLISHED	5850
9-23-2015	Happy National Estuaries Week!	APPROVED	PUBLISHED	5872
9-23-2015	How to have a Healthy Lawn	APPROVED	PUBLISHED	5926
9-22-2015	Happy National Estuaries Week!	APPROVED	PUBLISHED	5936
9-22-2015	How to have a Healthy Lawn	APPROVED	PUBLISHED	6002
9-21-2015	Happy National Estuaries Week!	APPROVED	PUBLISHED	6021
9-21-2015	How to have a Healthy Lawn	APPROVED	PUBLISHED	6189
9-11-2015	FREE Go Green Expo (TOMORROW)	APPROVED	PUBLISHED	6605
9-4-2015	FREE Go Green Expo	APPROVED	PUBLISHED	7007
9-3-2015	FREE Go Green Expo	APPROVED	PUBLISHED	7065
9-2-2015	FREE Go Green Expo	APPROVED	PUBLISHED	7137
9-1-2015	FREE Go Green Expo	APPROVED	PUBLISHED	7190
8-31-2015	FREE Go Green Expo	APPROVED	PUBLISHED	7283
7-2-2015	ONLY RAIN DOWN THE DRAIN	APPROVED	PUBLISHED	4919
7-1-2015	ONLY RAIN DOWN THE DRAIN	APPROVED	PUBLISHED	4934

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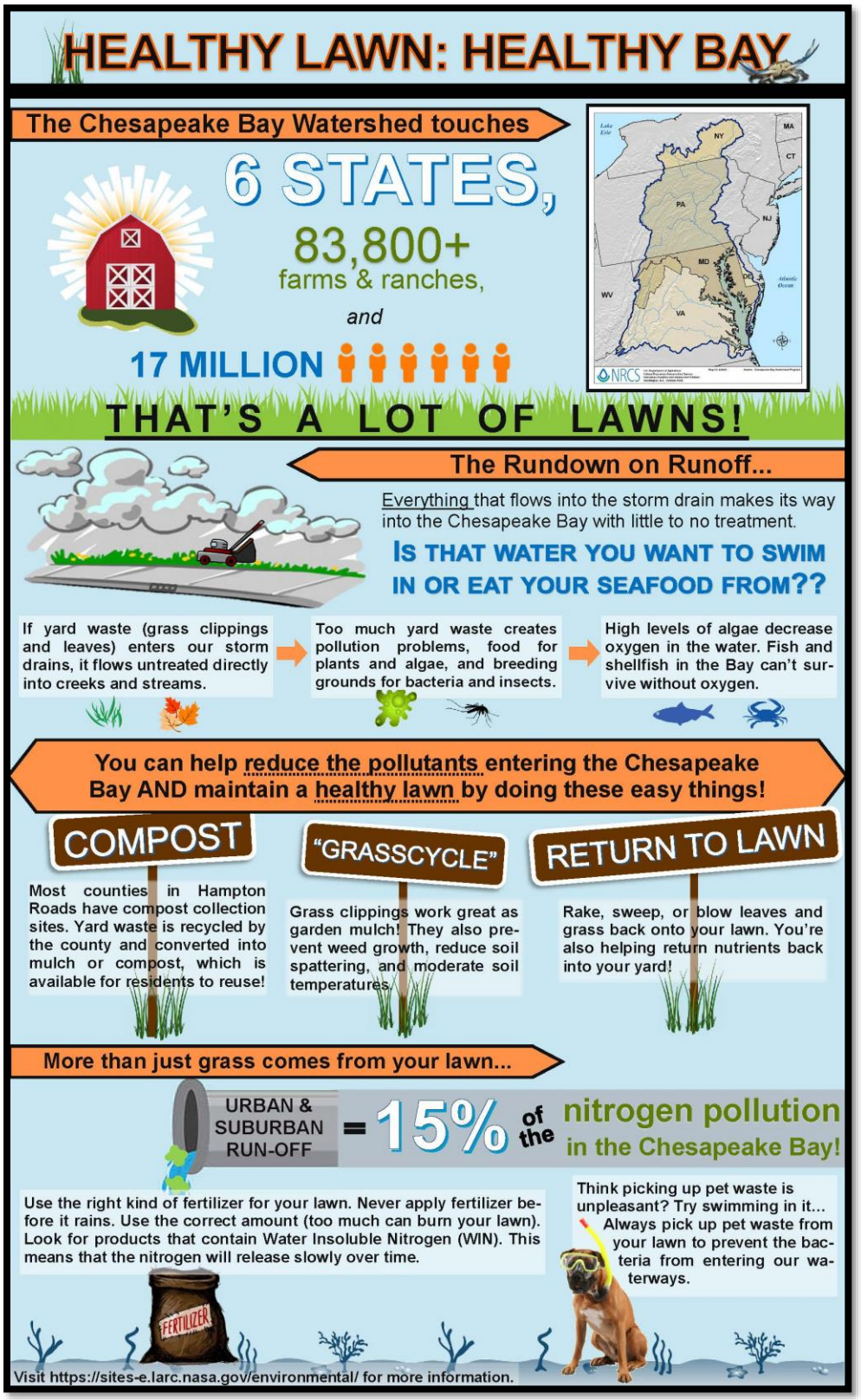


Figure 8 Infographic used in the Sept. 2015 stormwater article that received thousands of visitors. The article and infographic provided data on stormwater runoff into the Chesapeake Bay from nutrient rich sources, like lawns. It also provided tips to reduce the pollutants entering the Chesapeake Bay while still maintaining a healthy lawn.

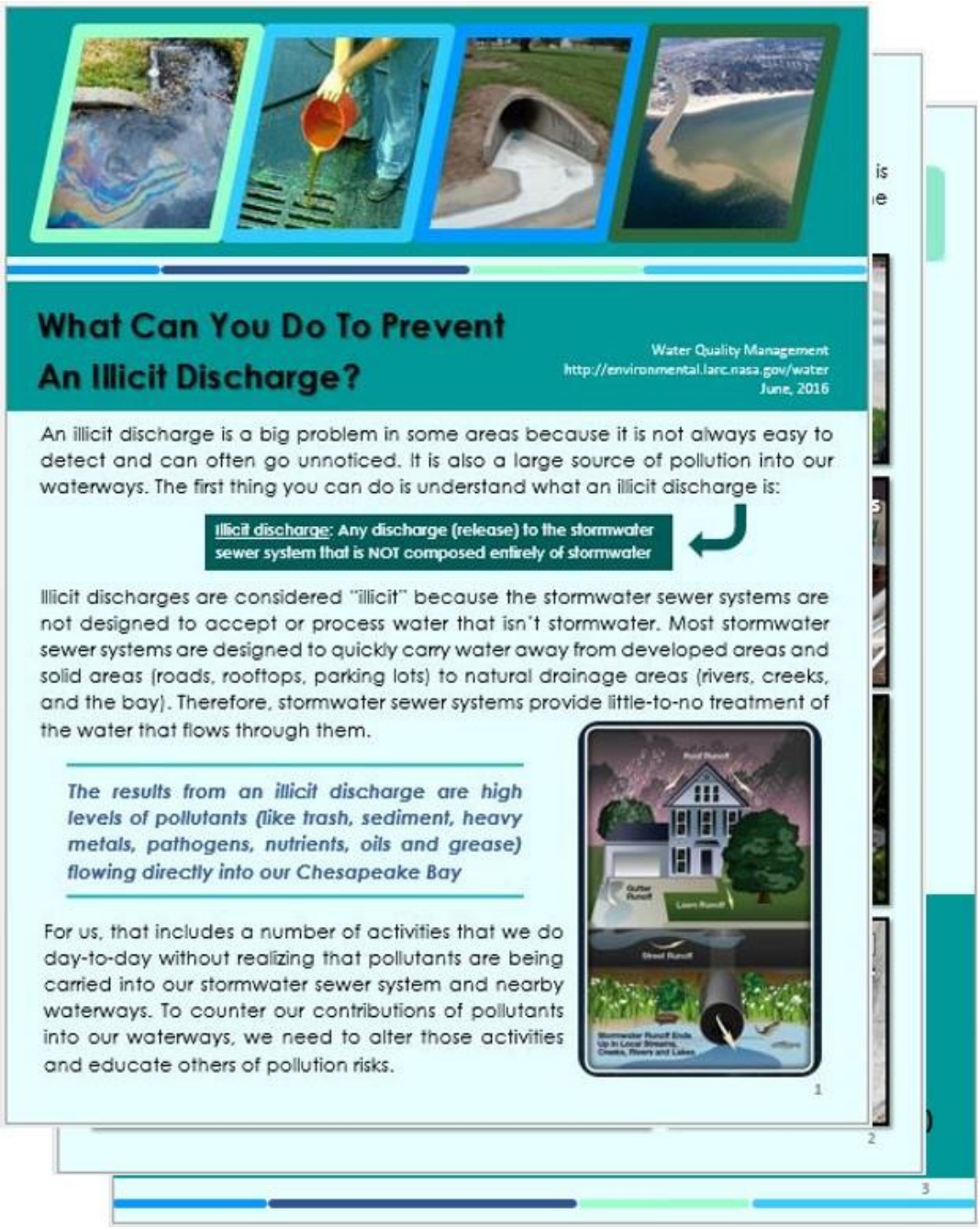
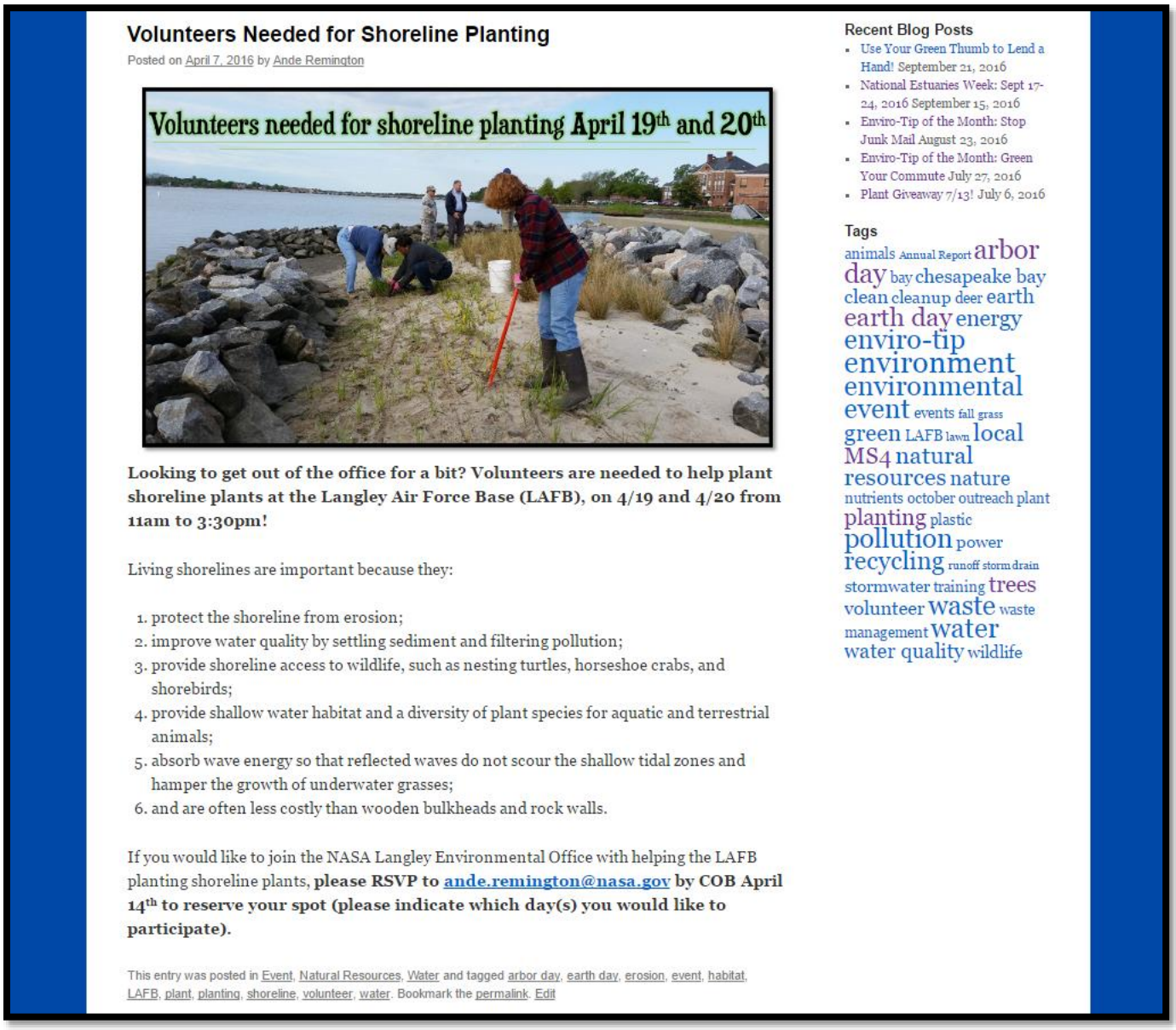


Figure 9 Sample screenshot of the IDDE article published in June, 2016. The article focused on defining, recognizing, preventing, and reporting illicit discharges at home and at NASA Langley.



Volunteers Needed for Shoreline Planting

Posted on April 7, 2016 by Ande Remington

Looking to get out of the office for a bit? Volunteers are needed to help plant shoreline plants at the Langley Air Force Base (LAFB), on 4/19 and 4/20 from 11am to 3:30pm!

Living shorelines are important because they:

1. protect the shoreline from erosion;
2. improve water quality by settling sediment and filtering pollution;
3. provide shoreline access to wildlife, such as nesting turtles, horseshoe crabs, and shorebirds;
4. provide shallow water habitat and a diversity of plant species for aquatic and terrestrial animals;
5. absorb wave energy so that reflected waves do not scour the shallow tidal zones and hamper the growth of underwater grasses;
6. and are often less costly than wooden bulkheads and rock walls.

If you would like to join the NASA Langley Environmental Office with helping the LAFB planting shoreline plants, **please RSVP to ande.remington@nasa.gov by COB April 14th to reserve your spot (please indicate which day(s) you would like to participate).**

This entry was posted in Event, Natural Resources, Water and tagged arbor day, earth day, erosion, event, habitat, LAFB, plant, planting, shoreline, volunteer, water. Bookmark the permalink. Edit

Recent Blog Posts

- Use Your Green Thumb to Lend a Hand! September 21, 2016
- National Estuaries Week: Sept 17-24, 2016 September 15, 2016
- Enviro-Tip of the Month: Stop Junk Mail August 23, 2016
- Enviro-Tip of the Month: Green Your Commute July 27, 2016
- Plant Giveaway 7/13! July 6, 2016

Tags

animals Annual Report arbor day bay chesapeake bay clean cleanup deer earth earth day energy enviro-tip environment environmental event events fall grass green LAFB lawn local MS4 natural resources nature nutrients october outreach plant planting plastic pollution power recycling runoff storm drain stormwater training trees volunteer waste waste management water water quality wildlife

Figure 10 Sample screenshot of the advertisement on the public environmental blog requesting volunteers for a local shoreline planting activity. The advertisement also informed website visitors on the importance of living shorelines. NASA Langley volunteers assisted our neighbors, the Langley Air Force Base, in planting over 3,000 shoreline plants that will provide many benefits for the Chesapeake Bay.