



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

Covering the period of July 1, 2020 – June 30, 2021



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

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Annual Reporting Requirements
Part I D 2

The annual report shall include the following general information:

- a. The permittee, system name, and permit number;
- b. The reporting period for which the annual report is being submitted;
- c. A signed certification as per Part III K;
- d. Each annual reporting item as specified in an MCM in Part I E; and
- e. An evaluation of the MS4 program implementation, including a review of each MCM, to determine the MS4 program's effectiveness and whether changes to the MS4 program plan are necessary.

General information:

- a. NASA Langley Research Center, VAR040092
- b. The reporting period for this annual report is July 1, 2020 through June 30, 2021
- c. The signed Certification Statement can be found on the last page of this annual report
- d. Each annual reporting item as specified in an MCM in Part I E can be found on pages 5-18
- e. A Program evaluation can be found on pages 3 – 4.

Part I D 2 e - Evaluation of MS4 Program Implementation

The Program Plan has guided NASA Langley Research Center (LaRC) in effectively implementing the requirements of the permit. MS4 program effectiveness was evaluated through the LaRC Environmental Management Office (EMO) internal review process considering public input. Opportunities for improvement were evaluated and the program's implementation was determined to be effective, thus no major changes were necessary. A review of each MCM is included below:

MCM 1 – Three new high priorities were selected based on the most pressing stormwater-related issues at LaRC, and the public contact information was updated. LaRC continued to advertise educational outreach on the public website, through distribution of articles, flyers and targeted e-mails, and numerous training sessions. LaRC has successfully reached a diverse audience with information on how to reduce stormwater pollution and protect and improve the water quality of local waterways. This component of the program was evaluated for effectiveness through EMO internal review process and public input. It was found to be very effective and no changes are necessary.

MCM 2 – LaRC solicits public input via the employee @LaRC announcement system to improve the Program Plan. Additionally, public input is encouraged at any time through our public environmental webpage. Reporting of illicit discharges is encouraged continuously during trainings, on our public website, and through outreach articles and flyers that are distributed quarterly. Personnel can contact EMO staff or fill out an online form or visit the public site for information on LaRC's IDDE program. LaRC's environmental team coordinates a variety of internal events and advertises external events to encourage public involvement. This component of the program was evaluated for effectiveness through EMO internal review process and public input. LaRC took advantage of new IT features, such as Microsoft Forms to facilitate reporting and streamline public input. A potential opportunity for improvement includes evaluating improved methods for tracking complaints and participation in events. The Program Plan will be updated should these improvements occur.

MCM 3 – Illicit discharges are prohibited at LaRC and are addressed primarily through LaRC's IDDE Handbook, the Langley Procedural Requirements (LPR) 8500.1, LaRC's approved Annual Standards and Specifications for Stormwater Management and Erosion and Sediment Control (AS&S), and annual trainings offered to personnel. LaRC also operates under a VPDES industrial permit and has robust procedures in place to minimize or prevent pollutant discharges. The IDDE component of the program was evaluated for effectiveness through EMO internal review process. This program was found to be effective and no Program Plan changes are needed.

MCM 4 – This component of the program is implemented primarily through LaRC's DEQ approved AS&S and LaRC's Environmental Construction Specifications Section 01 35 40.00 41. The AS&S provides detailed information on LaRC's stormwater construction program and ensure compliance with all regulatory requirements as well as Part I E 4 a 3 of the MS4 permit. The AS&S are evaluated annually by DEQ, while this component of the program was evaluated for effectiveness through EMO internal review process. This program was found to be effective. No Program Plan changes are needed beyond updating program contact and certification information.

MCM 5 – This component of the program is implemented primarily through LaRC's approved AS&S. Projects also comply with LaRC's Environmental Construction Specifications Section 01 35 40.00 41 and NASA Environmental Design Standards. The EMO also provides continuous feedback during design and construction to ensure compliance. In addition, LaRC's Green Infrastructure Maintenance Handbook was developed and has been updated to ensure adequate long-term operation and maintenance of SWM facilities. Minor document updates were completed as needed. This component of the program was

evaluated for effectiveness through EMO internal review process. This program was found to be effective and no Program Plan changes are needed.

MCM 6 – LaRC uses a variety of operational and maintenance BMPs to prevent and minimize pollutant discharge during Center operations. Appropriate control measures and pollution prevention practices are implemented primarily through language in procedural documents, including the Environmental and Energy Program Manual (LPR 8500.1), LaRC’s AS&S, and LaRC’s IDDE Handbook. The Center also utilizes a robust training plan that includes targeted training for contractors completing maintenance and construction tasks. LaRC also enforces the use of the Langley Form 461 (LF461), the “Environmental Project Planning Form”, that allows EMO to review projects and provide feedback or requirements to reduce negative environmental impacts. LaRC has met the requirement to develop and implement a SWPPP for the high-priority facility, Grounds Maintenance Yard, and continues to monitor and inspect the facility. Minor document updates were completed as needed. This component of the program was evaluated for effectiveness through EMO internal review process. The program was found to be effective. An opportunity for improvement includes evaluating potential improvements in written procedures. The Program Plan will be updated should these improvements occur.

Chesapeake Bay TMDL Special Conditions– LaRC submitted its Chesapeake Bay Phase Two Action Plan to the DEQ on October 31, 2019 and received approval from the DEQ on July 14, 2021. The program has been found to be effective and LaRC is ahead of project load reductions needed. The action plan will be maintained and implemented by EMO, and a copy is available upon request.

Back River TMDL Special Conditions– LaRC was allocated a waste load reduction for the Back River TMDL. To meet conditions of Part II of the General Permit, LaRC developed and implemented an action plan. LaRC submitted its Back River Action Plan to the DEQ on May 05, 2021 and is currently awaiting approval. The action plan will be maintained and implemented by EMO, and a copy is available upon request.

**Minimum Control Measure One – Public Education and Outreach
Annual Reporting Requirements – Part I E 1 g**

- (1) A list of the high-priority stormwater issues the permittee addressed in the public education and outreach program; and
- (2) A list of strategies used to communicate each high-priority stormwater issues.

The table below lists the high-priority stormwater issues addressed and the communication strategies used:

(1) High-Priority Stormwater Issues Addressed	(2) Strategies Used to Communicate
<p>Best Management Practices (BMPs) during Maintenance of Mechanical Processes</p>	<p>Media materials- an educational article <i>Maintenance Activities That May Impact Water Quality at LaRC</i>. The article discussed the different stormwater connections in the facilities and best management practices maintenance personnel can utilize when performing maintenance of mechanical systems or working in areas with a potential stormwater impact.</p> <p>Metric and Evaluation of Benefits: The educational article was published on 06/21/2021 to the public environmental website and advertised on 06/22 through 06/25, 06/28, and 06/30 via @LaRCs. The @LaRC advertisements received 109 “hits”. The article was also widely distributed via email to LaRC’s maintenance contractor personnel.</p>
<p>Water Pollution: Illicit Discharge Detection and Elimination (IDDE)</p>	<p>Media materials- an educational article, <i>Water Pollution: What is Illicit Discharge?</i> The article describes illicit discharge and the ways this pollution can impact normal local activities. Additionally, discusses how discharge will flow directly into the Chesapeake Bay. The article then highlights ways to prevent illicit discharge through their day-to-day activities and how to report illicit discharges or suspected water pollution on NASA Langley.</p> <p>Metric and Evaluation of Benefits: The educational article was published on 03/19/2021 to the public environmental website and advertised on 03/22 through 03/26 via @LaRCs. The @LaRC advertisements received a total of 58 “hits”.</p> <p>Speaking engagements- a detailed list of training events conducted in accordance with Part I E 6 m can be found under MCM 6 section. The following training sessions covered topics on stormwater pollution prevention, detecting and reporting illicit discharges, and spill response: <i>Environmental Refreshers: Erosion, Stormwater, and Waste</i>, held on 07/22/2020, 08/12/2020, and 09/01/2020; <i>Annual FEC trainings</i>, held on 07/30/2020, 08/11/2020, and</p>

(1) High-Priority Stormwater Issues Addressed	(2) Strategies Used to Communicate
	<p>09/03/2020; <i>Annual Waste Management and Spill Response Training</i>, held on 11/09/2020, 06/15/2021, and 06/23/2021; <i>Recognizing and Reporting Stormwater Pollution</i>, held on 05/04/2021.</p>
<p>Chesapeake Bay and Back River TMDL Education</p>	<p>Media materials- Two (2) educational articles: <i>Steps for Healthy Lawns and a Healthy Bay</i>, and <i>Tips for a Greener winter – Deicing Best Management Practices</i>. The articles describe illicit discharges and the ways this pollution can impact normal local activities, with focus on lawncare and maintenance activities, and removing winter precipitation on road surfaces. Additionally, the articles discuss how discharge flows directly into the Back River and Chesapeake Bay. The articles then highlight ways to prevent illicit discharge through day-to-day activities and how to report illicit discharges or suspected water pollution on NASA Langley.</p> <p>Metric and Evaluation of Benefits: The educational article <i>Steps for Healthy Lawns and a Healthy Bay</i> was published on 09/28/2020 to the public environmental website and advertised on 9/28 through 10/2 via @LaRCs. The @LaRC advertisements received a total of 336 “hits”. The educational article <i>Tips for a Greener winter – Deicing Best Management Practices</i> was published on 12/23/2020 to the public environmental website and advertised on 12/24 and 12/28 through 12/31 via @LaRCs. The @LaRC advertisements received a total of 167 “hits”.</p> <p>Speaking engagements- a detailed list of training events conducted in accordance with Part I E 6 m can be found under MCM 6 section. The following training sessions covered topics on stormwater pollution prevention, detection, and response within the Chesapeake Bay and Back River watersheds: <i>Environmental Refreshers: Erosion, Stormwater, and Waste</i>, held on 07/22/2020, 08/12/2020, and 09/01/2020; <i>Annual FEC trainings</i>, held on 07/30/2020, 08/11/2020, and 09/03/2020; <i>Annual Waste Management and Spill Response Training</i>, held on 11/09/2020, 06/15/2021, and 06/23/2021; <i>Recognizing and Reporting Stormwater Pollution</i>, held on 05/04/2021.</p>

**Minimum Control Measure Two – Public Education and Participation
Annual Reporting Requirements – Part I E 2 f**

- (1) A summary of any public input on the MS4 program received (including stormwater complaints) and how the permittee responded;
- (2) A webpage address to the permittee's MS4 program and stormwater website;
- (3) A description of the public involvement activities implemented by the permittee;
- (4) A report of the metric as defined for each activity and an evaluation as to whether the activity is beneficial to improving water quality; and
- (5) The name of other MS4 permittees with whom the permittee collaborated in the public involvement opportunities.

(1) LaRC requests public input on the MS4 program via the @LaRC announcement system (accessible to all employees). Additionally, public input is encouraged at any time through the environmental public webpage (which is also routinely promoted). The following is a summary of public input received on the MS4 program:

Public Input Received	Response and Implementation
<p>3/31/2021: Public input was received from a LaRC employee requesting increased education on a broader scope that will also apply to personnel working from home. Additionally, increase education on programs that families can engage in. Some ideas provided by the employee included, but are not limited to:</p> <ul style="list-style-type: none"> • How do watersheds connect communities? • How can someone speak with a water quality expert? • History of watersheds • What community groups improve local watersheds (Riverkeepers, Elizabeth River Project, etc.)? • What does LaRC do to mitigate issues? • Create a GIS map of the local watersheds with links to BMPs • Host a space for people to post photos of their watersheds • Activities for students and teachers 	<p>LaRC was very thankful for the abundance of suggestions. Many of these ideas are things that LaRC is already completing annually, so we will evaluate our distribution methods and advertising to reach a greater audience. LaRC will continue to promote local community groups and events, including family-friendly events, that focus on improving water quality and increasing education/awareness. Additionally, LaRC will incorporate watershed information into quarterly educational articles and trainings.</p>

(2) The LaRC MS4 program and stormwater website: <https://environmental.larc.nasa.gov/water/ms4/>.

(3,4) Public involvement activities implemented during the reporting year are described below. Each subsection lists the metric defined for each and an evaluation of the activity benefits. All events were promoted on Center through promotion, sponsorship, and/or involvement.

Category of Public Involvement Opportunity – Educational Events

1) NASA Langley’s Earth Day/Arbor Day Expo

Activity Description: EMO hosted the annual Earth Day and Arbor Day Expo virtually from 04/01/2021 to 05/07/2021. The event was comprised of webinars, virtual local tours, virtual expo, and a nature photo contest. The expo featured eight websites including LaRC programs and local environmental groups, such as askHRgreen, Elizabeth River Project, and EarthDay.org. These sites linked to daily environmental challenges, educational content, outreach flyers, and sustainability tips.

Metric and Evaluation of Water Quality Benefits: The event was coordinated by EMO staff, and announcements were advertised on the @LaRC page, public environmental blog, and center-wide emails. The @LaRC announcements received 1,162 visitors from 04/01/2021 to 05/07/2021. The nature photo contest received 69 entries, the *Beekeeping* webinar had 57 attendees, the *Planting for Pollinators* webinar had 54 attendees, and the *Working from Home Energy Efficiency* webinar had 40 attendees. Attendees learned about impacts from stormwater pollution, energy conservation, proper recycling guidelines, and simple acts to “go green”. The virtual format of the overall event was well received and LaRC was able to cross promote events from other NASA centers.

Category of Public Involvement Opportunity – Disposal or Collection Events

1) Household hazardous chemicals collection

Activity Description: LaRC promotes various local household chemical collection events held around Hampton Roads. Advertising collection events for proper disposal of household chemicals prevents the waste from potentially entering our local landfills and waterways. These events are promoted through the @LaRC announcement page.

Metric and Evaluation of Water Quality Benefits: LaRC participated through promotion of this event via @LaRC announcements. The @LaRC advertisements ran 17 times throughout the permit year, and received a total of 939 “hits”. Household chemical collection events occur throughout the year and serves communities that surround NASA Langley.

Category of Public Involvement Opportunity – Restoration

1) America Recycles’ Day

Activity Description: Hampton Roads and askHRgreen.org celebrated *America Recycles’ Day* on November 14 and 21, 2020. This two-day event is the only nationally-recognized day dedicated to promoting and raising awareness about recycling in the U.S. In Hampton Roads, the event was focused on curbside recycling and how to reduce household waste.

Metric and Evaluation of Water Quality Benefits: LaRC participated through promotion of this event via @LaRC announcements. The @LaRC announcements received 161 visitors from 11/03/2020 through 11/12/2020. By advertising *America Recycles’ Day* event, LaRC increases public awareness for environmental restoration activities and promotes community participation. The event helps remove and reduce litter from neighborhoods and waterways, and increase participation in recycling.

2) SWIFT Research Center Virtual Tour

Activity Description: LaRC provided an opportunity for personnel to virtually tour the SWIFT Research Center. SWIFT is planning to help the Bay by reducing the amount of nutrients (nitrogen and phosphorus) discharged into the rivers, replenishing groundwater supply, fighting sea level rise, protecting groundwater from saltwater intrusion, and supporting Virginia's economy.

Metric and Evaluation of Water Quality Benefits: The virtual tour was promoted via @LaRC announcements. The @LaRC announcements received 88 visitors from 1/26/2021 through 01/29/2021.

3) 33rd Annual Clean the Bay Day

Activity Description: The 33rd Annual Clean the Bay Day – Clean the Bay Your Way, this year was a six-day event spanning from 05/31/2021 through 06/05/2021. This year's event was all about flexibility to allow anyone to participate and to introduce participants to some greater unseen problems the Chesapeake Bay watershed faces.

Metric and Evaluation of Water Quality Benefits: LaRC participated through promotion of this event via @LaRC announcements. The @LaRC announcements received 136 visitors from 05/24/2021 through 06/04/2021. The event promoted reducing and removing litter from neighborhoods and waterways, and increased awareness of unseen problems the Bay watershed faces. Degraded habitats, polluted runoff, and nitrogen and phosphorus pollution were some topics of focus throughout the event.

Category of Public Involvement Opportunity – Pollution Prevention

1) Local Plant Sales

Activity Description: The Virginia Living Museum hosted a Fall Native Plant Sale on September 17, 19, 20, 26, and 27, 2020. Attendees were able to purchase and learn about approximately 134 species of native perennials, vines, shrubs, and trees. LaRC received positive feedback on these events in the past and looks to continue supporting and promoting similar workshops in the Hampton Roads community.

Metric and Evaluation of Water Quality Benefits: LaRC promoted this event via @LaRC announcement and received 376 visitors from 09/14/2020 through 09/25/2020. By advertising local plant sales, LaRC encourages environmental stewardship at home. This outreach can potentially alleviate excessive use of pesticides and fertilizers, keeping unnecessary pollutants out of the stormwater system.

2) Online Vegetable Gardening Classes

Activity Description: The Virginia Cooperative Extension hosted a vegetable gardening class on Saturday, March 27, 2021. Attendees learned about garden plans, crop families, watering, zones, pest prevention, plant nutrition and harvesting. LaRC received positive feedback on these events in the past and looks to continue supporting and promoting similar workshops in the Hampton Roads community.

Metric and Evaluation of Water Quality Benefits: LaRC promoted this event via @LaRC announcement and received 113 visitors from 03/24/2021 through 03/27/2021. By advertising horticulture classes, LaRC encourages environmental stewardship at home. This outreach can potentially alleviate excessive use of pesticides and fertilizers, keeping unnecessary pollutants out of the stormwater system.

**Minimum Control Measure Three – Illicit Discharge Detection and Elimination
Annual Reporting Requirements – Part I E 3 e**

- (1) A confirmation statement that the MS4 map and information table have been updated to reflect any changes to the MS4 occurring on or before June 30 of the reporting year;
- (2) The total number of outfalls screened during the reporting period as part of the dry weather screening program; and
- (3) A list of illicit discharges to the MS4 including spills reaching the MS4 with information as follows:
 - (a) The source of illicit discharge;
 - (b) The dates that the discharge was observed, reported, or both;
 - (c) Whether the discharge was discovered by the permittee during dry weather screening, reported by the public, or other method (describe);
 - (d) How the investigation was resolved;
 - (e) A description of any follow-up activities; and
 - (f) The date the investigation was closed.

- (1) **Confirmation Statement:** LaRC’s MS4 map and information table have been updated to reflect any changes to the MS4 occurring on or before 06/30/2021. LaRC will continue to maintain a robust GIS-based MS4 map that includes a storm sewer map and information table.
- (2) NASA LaRC has 16 MS4 outfalls. All 16 outfalls were inspected quarterly, totaling 64 inspections during the reporting period. Additionally, visual outfall inspections often occur weekly for several outfalls in the core industrial area. Screening reports are stored physically and electronically with the EMO.
- (3) A total of three (3) illicit discharges were reported and investigated:

Illicit Discharge Investigation #1: Utility Tunnel #1 Sump Pump

- (a) Water flow from a broken connection with the sump pump beside tunnel hatch into a nearby drop inlet;
- (b,c) Observed and reported by LaRC personnel on 02/03/2021;
- (d-f) Water was identified as rainwater and groundwater intrusion into the utility tunnels, therefore not treated or polluted water. There were no concerns with the water draining to the drop inlet. Necessary repairs were scheduled, and the area was restored back to its original grassy condition. The investigation was closed on 3/30/2021.

Illicit Discharge Investigation #2: AR-AFFF Fire Station

- (a) Illicit discharge from firefighters troubleshooting the foam system in the fire apparatus (as it would not discharge during an incident overnight). When the supply pipe was opened, it was still pressurized and about half a pint of foam (AR-AFFF) spilled onto the front drive and into the concrete swale;
- (b,c) Observed and reported by LaRC personnel on 02/25/2021;

(d-f) Fire Department has taken steps to review the Spill Plan and conduct specific foam training to new firefighters stationed at NASA Langley. Engineering practices have been put in place to prevent a concentrate spill in the future. Spill Response Procedures were initiated upon discovery, and no foam was observed downstream or at the outfall. The investigation was closed on 02/25/2021.

Illicit Discharge Investigation #3: Outfall 003 Hot Water

(a) Steam condensate overflow to storm (high temperature);
 (b,c) Observed and reported by LaRC personnel on 03/08/2021;
 (d-f) B1215 personnel immediately began found alternatives to reroute the hot water and to add cool water to the storm system to reduce the outfall temperature. The facility began running boilers to consume the condensate and quickly eliminated all hot water discharge to the storm sewer. To prevent future occurrences, the EMO retrained and increased awareness of LaRC's water permits and allowable discharges to the storm sewer system. The EMO met with targeted groups (B1215 facility personnel; the on-Center construction, maintenance, and operations contractor, and LaRC Facility Coordinators), and will continue providing outreach education for the general NASA LaRC audience. The investigation was closed on 03/12/2021.

**Minimum Control Measure Four – Construction Site Stormwater Runoff Control
 Annual Reporting Requirements – Part I E 4 d**

- (1) If the permittee implements a construction site stormwater runoff program in accordance with Part I E 4 a (3):
 - (a) A confirmation statement that land disturbing projects that occurred during the reporting period have been conducted in accordance with the current department approved standards and specifications for erosion and sediment control; and
 - (b) If one or more of the land disturbing projects were not conducted with the department approved standards and specifications, an explanation as to why the projects did not conform to the approved standards and specifications.
- (2) Total number of inspections conducted; and
- (3) The total number and type of enforcement actions implemented and the type of enforcement actions.

- (1) NASA LaRC implements a construction site stormwater runoff program in accordance with Part I E 4 a (3).
 - (a) **Confirmation Statement:** Land disturbing projects that occurred during the reporting period have been conducted in accordance with the current Department approved standards and specifications for erosion and sediment control and stormwater management.
 - (b) Not applicable.

- (2) The total number of NASA LaRC (MS4 staff) inspections conducted was 30 for the reporting year.

- (3) Per approved LaRC Annual Standards and Specifications, the contractor may remedy minor deficiencies that have no environmental impacts without formal enforcement action, if this is done in a timely manner and not a recurring issue. One (1) issue required formal enforcement action, through a signed *Corrective Action Notice* form.

Project	No. of Enforcement Actions	Type of Enforcement	Issues Driving the Enforcement
VAR10J220	1	Formal written Corrective Action Notice (CAN) submitted to the contractor and project team.	10/01/2020 – Maintaining SWPPP Compliance: Chemicals should be disposed of appropriately in accordance with the P2 Plan.

**Minimum Control Measure Five – Post Construction Stormwater Management
Annual Reporting Requirements – Part I E 5 i**

- (1) Implementation of a Virginia Stormwater Management Program in accordance with Part I E 5 a (1) and (2); (a) & (b)
- (2) Total number of inspections conducted on stormwater management facilities owned or operated by the permittee;
- (3) A description of the significant maintenance, repair, or retrofit activities performed on the stormwater management facilities owned or operated by the permittee to ensure it continues to perform as designed. This does not include routine activities such as grass mowing or trash collection;
- (4) A confirmation statement that the permittee submitted stormwater management facility information through the Virginia Construction Stormwater General Permit database for those land disturbing activities for which the permittee was required to obtain coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities in accordance with Part I E 5 f or a statement that the permittee did not complete any projects requiring coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities; and
- (5) A confirmation statement that the permittee electronically reported BMPs using the DEQ BMP Warehouse in accordance with Part I E 5 g and the date on which the information was submitted.

- (1) Not applicable. LaRC does not implement a Virginia SWM Program in accordance with Part I E 5 a (1) and (2). LaRC’s SWM program fits Part I E 5 a (3).
- (2) Twenty-three (23) formal inspections were conducted, once for each of the 23 stormwater management facilities operated at LaRC. EMO and the support contractor also conduct SWM facility inspections during construction as part of the Construction General Permit (CGP) inspection process.

- (3) The majority of the maintenance completed on the SWM facilities was routine. The following significant maintenance was performed:

Pervious Paver Maintenance (B2102/B1205) – LaRC’s pavers located near B2102/B1205 underwent maintenance and restoration in 03/2021. The walkway had experienced severe erosion from a sump pump water leak and needed repair.

- (4) **Confirmation Statement:** LaRC did not complete any projects requiring coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities. LaRC’s active CGP project was still ongoing (VAR10J220), and a new project received CGP coverage at the very end of the permit year (VAR10P840).

- (5) **Confirmation Statement:** LaRC electronically reported BMPs using the DEQ BMP Warehouse on 11/23/2020. The approved submission was labeled as 20201123.

**Minimum Control Measure Six – Pollution Prevention/Good Housekeeping
Annual Reporting Requirements – Part I E 6 q**

- (1) A summary of any operational procedures developed or modified in accordance with Part I E 6 a during the reporting period;
- (2) A summary of any new SWPPPs developed in accordance Part I E 6 c during the reporting period;
- (3) A summary of any SWPPPs modified in accordance with Part I E 6 f or the rationale of any high priority facilities delisted in accordance with Part I E 6 h during the reporting period;
- (4) A summary of any new turf and landscape nutrient management plans developed that includes:
 - (a) Location and the total acreage of each land area; and
 - (b) The date of the approved nutrient management plan
- (5) A list of the training events conducted in accordance with Part I E 6 m, including the following information:
 - (a) The date of the training event;
 - (b) The number of employees who attended the training event; and
 - (c) The objective of the training event.

- (1) LaRC has not developed any new or modified any existing operational procedures during the reporting period. Existing written procedures are in accordance with Part I E 6 a, and are summarized in the MS4 Program Plan.
- (2) No new SWPPPs were developed during the reporting period. One existing SWPPP continued to be implemented.
- (3) No SWPPP modifications were needed or implemented. The one high priority facility was not delisted during the reporting period.
- (4) No new turf and landscape nutrient management plans were developed during the reporting period. LaRC has no applicable lands where nutrients are applied to a contiguous area of more than one (1) acre.
- (5) The following is a summary of completed training during the reporting year:

Training Requirement/ Objective	Selected Audience	Summary
<p>(1) Field personnel receive training in the recognition and reporting of illicit discharges no less than once per 24 months</p>	<p>Facility Environmental Coordinators (FECs)</p>	<p>Annual FEC Training – Training was held on 07/22/2020, 07/30/2020, 18/11/2020, 08/12/2020, 09/01/2020, and 09/03/2020 with 16, 13, 13, 20, 4, and 4 attendees, respectively. A total of 70 FECs were trained. FECs are asked to monitor their facilities for illicit discharge concerns and are the primary “eyes and ears” for the EMO. The FEC training course goes into detail about stormwater pollution prevention and the importance of LaRC’s IDDE program. It also discusses how to make proper reports to the EMO.</p> <p>Annual Waste Management and Spill Response Training – Training was held on 11/09/2020, 06/15/2021, and 06/23/2021 with 105, 300, and 289 attendees, respectively. This annual training is mandatory for all Center employees (including FECs) that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. A total of 694 Center employees were trained. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains.</p>
	<p>Facility Safety Head, Facility Coordinator</p>	<p>Illicit Discharge/Stormwater Management Training – A special training session, titled <i>Recognizing and Reporting Stormwater Pollution</i>, was held on 05/04/2021 with 83 attendees. The audience consisted of LaRC Facility Safety Heads and Facility Coordinators. Often, these individuals are the most knowledgeable of their facility’s operations and maintenance and are likely to recognize and report water quality concerns. This training focused on stormwater runoff pollution, impacts on water quality, and possible sources of pollution around LaRC facilities. The training also provided tips on how to recognize illicit discharges, and resources available at LaRC to report an illicit discharge.</p>
	<p>Personnel who handle waste on Center.</p>	<p>Annual Waste Management and Spill Response Training – Training was held on 11/09/2020, 06/15/2021, and 06/23/2021 with 105, 300, and 289 attendees, respectively. This annual training is mandatory for all Center employees (including FECs) that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. A total of 694 Center employees were trained. Stormwater pollution prevention is covered in the training, along with spill</p>

Training Requirement/ Objective	Selected Audience	Summary
		response to prevent materials from reaching storm drains.
(2) Employees performing road, street, and parking lot maintenance receive training in pollution prevention and good housekeeping associated with those activities no less than once per 24 months	Grounds Maintenance Contractor	Grounds Management Training – This training is delivered biannually. The most recent training was held on 06/10/2021 and had a total of 10 attendees. The training is focused on several stormwater best management practices specific to their daily workload, including the management of grass clippings, removing debris from catch basins, and spill cleanup. Attendees were also given information on what illicit discharges might look like at LaRC, and how to report issues or concerns of water pollution to the EMO.
	Jacobs (primary Center contractor) Personnel, and any interested LaRC personnel	Maintenance Stormwater Management Training – A special training flyer, titled <i>Maintenance Activities That May Impact Water Quality at LaRC</i> , was sent on 06/21/2021. This training educated personnel on stormwater runoff pollution, impacts on water quality, and possible sources of pollution in the workplace. Added emphasis was placed upon water quality risks during maintenance, including street and parking lot maintenance. The training also provided tips on how to recognize illicit discharges, and resources available at LaRC to report an illicit discharge.
(3) Employees working in and around maintenance, public works, or recreational facilities receive training in good housekeeping and pollution prevention practices associated with those facilities no less than once per 24 months	Facility Environmental Coordinators (FECs)	Annual Waste Management and Spill Response Training – Training was held on 11/09/2020, 06/15/2021, and 06/23/2021 with 105, 300, and 289 attendees, respectively. This annual training is mandatory for all Center employees (including FECs) that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. A total of 694 Center employees were trained. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains.
	Jacobs (primary Center contractor) Personnel	Maintenance Stormwater Management Training – A special training flyer, titled <i>Maintenance Activities That May Impact Water Quality at LaRC</i> , was sent on 06/21/2021. This training was targeted towards Maintenance persons who conducts activities that have the potential to impact water quality (draining of cooling towers and boilers, washing of equipment,

Training Requirement/ Objective	Selected Audience	Summary
		chiller tubes and pumps, and dewatering of basements and sumps) at LaRC. The training focused how to prevent, recognize, and report illicit discharges at work sites and facility maintenance projects. Topics covered included proper procedures for day-to-day tasks, best management practices, good housekeeping, and getting proper environmental review of a project before work begins.
	Grounds Maintenance Contractor	Grounds Management Training – This training is delivered biannually. The most recent training was held on 06/10/2021 and had a total of 10 attendees. The training is focused on several stormwater best management practices specific to their daily workload, including the management of grass clippings, removing debris from catch basins, and spill cleanup. Attendees were also given information on what illicit discharges might look like at LaRC, and how to report issues or concerns of water pollution to the EMO.
(4) Employees and contractors hired by the permittee who apply pesticides and herbicides are trained or certified in accordance with the Virginia Pesticide Control Act.	Grounds Maintenance Contractor	LaRC has very limited recreational facilities due to its 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 Grounds Management Training. The Grounds Maintenance contract is responsible for the minor amounts of pesticides and herbicides applied on Center. The program is primarily need-based and done via spot treatments (e.g., someone calls in a wasp nest to be sprayed). LaRC has required, through specific contract language, that the Grounds Maintenance contract operator carry all necessary state licenses. This contract language ensures that this requirement is met, or the operator can't work at LaRC.
(5) Employees and contractors serving as plan reviewers, inspectors, program administrators, and construction site operators obtain the appropriate certifications as	Environmental Management Office (EMO)	Mrs. Ande Remington serves as LaRC's Water Program Manager. Mrs. Remington oversees all ESC and SWM Plan reviews and inspection programs. Mrs. Remington has ESC and SWM Combined Administrator certifications. Ande Remington, Certification #DCA0291 (Expires 10/29/2022)

Training Requirement/ Objective	Selected Audience	Summary
<p>required under the Virginia Erosion and Sediment Control Law and its attendant regulations; and (6) Employees and contractors implementing the stormwater program obtain the appropriate certifications as required under the Virginia Stormwater Management Act and its attendant regulations;</p>		<p>Mr. Sarat Calamur supports LaRC’s Water Program by participating in plan reviews and overseeing the inspection programs. Mr. Calamur has ESC and SWM Combined Administrator certifications.</p> <p>Sarat Calamur, Certification #DCA0487 (Expires 9/22/2023)</p> <p>Ms. Jazmin Argarin provides contract support to LaRC’s Water Program Manager. Support includes site inspections and conducting multi-media field inspections of construction sites and maintenance tasks. Ms. Argarin is a dual combined inspector for ESC and SWM. She is also provisionally certified as a SWM plan reviewer (training received 12/3/2020).</p> <p>Dual Combined Inspector #DIN0965 (Expires 8/11/2024)</p>
<p>(7) Employees whose duties include emergency response have been trained in spill response. Training of emergency responders such as firefighters and law-enforcement officers on the handling of spill releases as part of a larger emergency response training shall satisfy this training requirement and be documented in the training plan.</p>	<p>All applicable Center Personnel</p>	<p>Annual Waste Management and Spill Response Training – Training was held on 11/09/2020, 06/15/2021, and 06/23/2021 with 105, 300, and 289 attendees, respectively. This annual training is mandatory for all Center employees (including FECs) that use, handle, or request disposal of hazardous materials, oils, or hazardous waste. A total of 694 Center employees were trained. Stormwater pollution prevention is covered in the training, along with spill response to prevent materials from reaching storm drains.</p>
	<p>Emergency responders such as firefighters and law-enforcement officers</p>	<p>Emergency responders receive training on the handling of spill releases as part of a larger emergency response training.</p>

Part II TMDL Summaries	
TMDL Special Conditions – Chesapeake Bay TMDL Annual Reporting Requirements – Part II A 13	
a.	A list of BMPs implemented during the reporting period but not reported to the DEQ BMP Warehouse in accordance with Part I E 5 g and the estimated reduction of pollutants of concern achieved by each and reported in pounds per year;
b.	If the permittee acquired credits during the reporting period to meet all or a portion of the required reductions in Part II A 3, A 4, or A 5, a statement that credits were acquired;
c.	The progress, using the final design efficiency of the BMPs, toward meeting the required cumulative reductions for total nitrogen, total phosphorus, and total suspended solids; and
d.	A list of BMPs that are planned to be implemented during the next reporting period.

- a. All BMPs implemented during the reporting period were reported to the DEQ BMP Warehouse in accordance with Part I E 5 g. Submission ID was 20201123.
- b. Not applicable. NASA LaRC did not acquire credits to meet required reductions.
- c. The cumulative progress is detailed in the table below. The tasks scheduled for PY3 were annual street sweeping, catch basin cleaning, and land conversion via demolition of facilities. Due to COVID and funding, the schedule of buildings planned for demolition was altered. In PY3, the demolition of B1194 and B1200 began. The following table outlines the progress toward meeting the required cumulative reductions for total nitrogen, total phosphorus, and total suspended solids.

Cumulative Progress Report end of PY3:

Sub source	Pollutant	Load Reduction Required by 2023 (end of permit cycle)	Total Load Reduction Achieved to Date	Remaining Load Reductions Planned	Cumulative Load Reductions Planned/Achieved through 6/30/2023 (Permit Cycles 1 and 2)
Regulated Urban Impervious	TN	57.28	276.71	161.28	437.99
Regulated Urban Pervious		46.04	31.48	18.12	49.6
Regulated Urban Impervious	TP	21.03	89.1	64.64	153.74
Regulated Urban Pervious		3.71	3.08	1.72	4.8
Regulated Urban Impervious	TSS	7952.08	25637.55	21875.45	47513.45
Regulated Urban Pervious		638.79	526.56	301.16	827.72

- d. The following is a list of control measures expected to be implemented during PY4:
- One facility (B1222E) planned for demolition will equate to a land-use change removing 0.05 acres of impervious surface and converted to a grass condition.
 - Two facilities (B1202, B1209) planned for demolition will equate to a land-use change removing 3.92 acres of impervious surface and converted to a grass condition.
 - One-acre reforestation activity is scheduled that will equate to a land-use change of pervious to forest and include the credit for forest buffer.
 - LaRC will continue the street sweeping program, annual mass load credit approach, during PY4.
 - LaRC will continue to implement a catch basin cleaning program.
 - LaRC will continue to implement ESC controls on land disturbing activities.

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, Environmental Branch Head

Date

VAR040092 NASA Langley Research Center
Permit Number MS4 Name