FINAL
Back River
Bacteria Total Maximum Daily Load Action Plan

JBLE-Langley Virginia

Permit Year 3: 1 July 2020 - 30 June 2021

JBLE-Langley
633 CES/CEIE
37 Sweeney Blvd
JBLE-Langley VA 23665

October 2021

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LIST OF ABBREVIATIONS AND ACRONYMS

633 CES/CEIE	633d Civil Engineer Squadron/Environmental Element
ACC	Air Combat Command
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
BASH	Bird/Animal Aircraft Strike Hazard
BMP	Best Management Practice
cfu/yr	Colony Forming Units per Year
EPA	Environmental Protection Agency
FW	Fighter Wing
IDDE	Illicit Discharge Detection and Elimination
JBLE–Langley	Joint Base Langley Eustis–Langley
MCM	Minimum Control Measure
MS4	Municipal Separate Storm Sewer System
NACA	National Advisory Council for Aeronautics
NASA	National Aeronautics and Space Administration
NMP	Nutrient Management Plan
SABER	Simplified Acquisition of Base Engineer Requirements
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TNCC	Thomas Nelson Community College
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VESCP	Virginia Erosion and Sediment Control Plan
VSMP	Virginia Stormwater Management Program
WLA	Wasteload Allocation

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1.0 INTRODUCTION

1.1 Background

The Virginia Department of Environmental Quality (VDEQ) *2006 303(d) Total Maximum Daily Load Priority List and Report* listed Back River as not supporting its designated uses for shellfish harvesting and recreation due to fecal coliform bacteria standards violations (VDEQ, 2006a). Based on the 303(d) listings in the Back River, VDEQ prepared total maximum daily loads (TMDL) for eleven impaired shellfish harvesting sites and one impaired recreational site in the Back River watershed (VDEQ, 2006b). A TMDL is the maximum amount of a pollutant that a waterbody can assimilate and still support its designated use(s). Between 2006 and 2014, additional areas of the Back River and its tributaries were identified as impaired due to bacteria violations. In 2014, VDEQ updated the 2006 TMDL to include the new impairments, account for water quality improvements that occurred after the 2006 TMDL, refine the list of sources and include wasteload allocations for Municipal Separate Storm Sewer System (MS4) permittees (VDEQ, 2014). In 2017, VDEQ drafted revised TMDLs for fecal coliform bacteria in Back River to account for changes in methods used to measure bacteria concentrations (mTEC method) and the associated water quality standard (VDEQ, 2017a). The 2017 TMDLs, which became final on 09 February 2018, include updated information on the listing status of assessment units according to the 2014 305(b)/303(d) Water Quality Assessment Integrated Report (VDEQ, 2014) and assign a wasteload allocation (WLA) for bacteria to Joint Base Langley Eustis–Langley (JBLE–Langley). The WLA includes that portion of the TMDL that is assigned to permitted point sources, such as MS4s. The WLA is a portion of the TMDL load and represents the allowable load a permittee may discharge to the waterbody and still meet water quality standards.

JBLE–Langley is authorized to discharge stormwater from the installation in accordance with an industrial stormwater permit (Permit No. VAR052285) and an MS4 permit (Permit No. VAR040140), both issued by the VDEQ. The MS4 permit identifies minimum control measures (MCM) and special condition requirements, measurable goals and best management practices (BMP) selected for implementation at JBLE–Langley. Special Condition 1 found in Section II.B.1 of the JBLE–Langley MS4 permit requires the installation to maintain a specific TMDL Action Plan for pollutants allocated to the MS4 in an approved TMDL. The first MS4 five-year permit cycle ended on 30 June 2018 and JBLE–Langley entered the program during Permit Year 5. The JBLE–Langley MS4 permit became effective on 03 August 2017 and expired on 30 June 2018 (VDEQ, 2017b); however, it was administratively continued until the issuance of the new permit. The reissuance of the permit for the second permitting cycle became effective on 01 November 2018 and expires on 31 October 2023. As part of maintaining compliance with the MS4 permit and the JBLE–Langley MS4 Program Plan, the installation is required to develop TMDL Action Plans for the Back River to address bacteria impairment in this waterbody. Specifically, JBLE–Langley (MS4 permittee) must update the MS4 Program Plan to incorporate approvable TMDL Action Plans that identify the BMPs and other interim milestone activities. The first bacteria TMDL Action Plan for the Back River for the second permitting cycle was completed on Septemeber 2019. This TMDL Action Plan for the Back River must be completed by 01 November 2021.

1.2 Purpose and Objectives

The purpose of this bacteria TMDL Action Plan is to demonstrate future plans to reduce fecal bacteria sources and loadings at JBLE–Langley. The objective of the Action Plan is to describe the following:

1. Permittee's legal authority applicable to reducing the pollutant,
2. Management practices (control measures) to address the TMDL pollutant, including control measures beyond the MS4 MCMs,
3. Enhanced public education, outreach and employee training programs,
4. An assessment of significant pollutant sources and
5. A method to assess the Action Plan for its effectiveness in reducing the pollutant.

1.3 Action Plan Organization

This bacteria TMDL Action Plan is organized into the following sections:

- Section 1.0 presents the background and objectives of the bacteria TMDL Action Plan.
- Section 2.0 discusses the JBLE–Langley installation.
- Section 3.0 describes the TMDL waterbodies.
- Section 4.0 describes the bacteria control measures that are applicable to the MS4 permit MCMs.
- Section 5.0 describes the additional bacteria control measures beyond the MCMs.
- Section 6.0 discusses the BMP implementation schedule and assessment.
- Section 7.0 contains a list of references associated with this Action Plan.

2.0 JBLE–LANGLEY INSTALLATION

JBLE–Langley is a 3,152-acre facility located on the Chesapeake Bay in the southern end of the lower Virginia peninsula, just north of the City of Hampton, Virginia and south of the City of Poquoson, Virginia (Figure 2-1). JBLE–Langley is the oldest continuously active air base in the United States and is home to the 633d Air Base Wing, 1st Fighter Wing (FW), Headquarters Air Combat Command (ACC), the 480th Intelligence Wing and other tenant units. The 1st FW flies F-22 Raptor and T-38 Talon aircraft.

In 1916, the National Advisory Council for Aeronautics (NACA), the predecessor to the National Aeronautics and Space Administration (NASA), established a joint proving ground for Army, Navy and NACA aircraft. In 1917, the site was designated Langley Field in honor of one of the early pioneers of flight, Samuel Pierpont Langley.

At the outbreak of World War II, Langley took on a new mission–to develop special detector equipment used in antisubmarine warfare. Langley units were pivotal in the sinking of enemy submarines off the United States coast during the war. On 25 May 1946, the headquarters of the newly formed Tactical Air Command was established at Langley. The Command's mission was to organize, train, equip and maintain combat-ready forces capable of rapid deployment to meet the challenges of peacetime air sovereignty and wartime air defense. In January 1948, Langley Field officially became Langley Air Force Base (AFB). Today, the host unit is the 1st FW, with the mission of maintaining combat capability for rapid global deployment to conduct air superiority operations. On 1 June 1992, JBLE–Langley became the headquarters of ACC, as Tactical Air Command was deactivated as part of the Air Force's restructuring. Langley AFB became a joint-base with Fort Eustis on 1 October 2010, forming Joint Base Langley–Eustis.

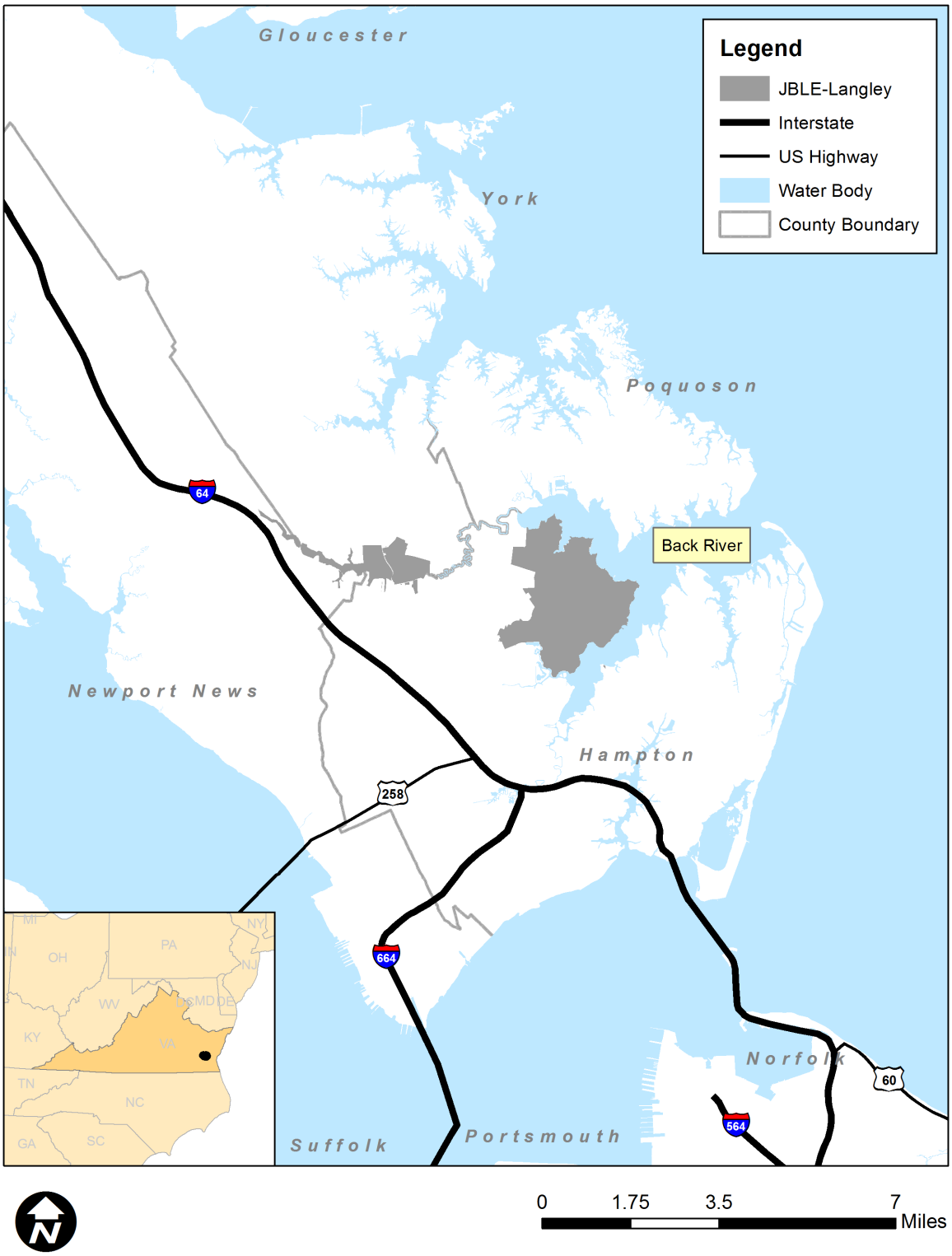


Figure 2-1. Site Location Map, JBLE–Langley

3.0 TMDL WATERBODIES

The Back River is located along the western shore of the Chesapeake Bay about five (5) miles south of the Poquoson River mouth as illustrated in Figure 3-1. This waterbody is listed as impaired for fecal coliform, enterococcus and *E. coli* bacteria, in violation of the Virginia Administrative Code (VAC) 9VAC25-260-160 and 9VAC25-260-170A water quality standards.

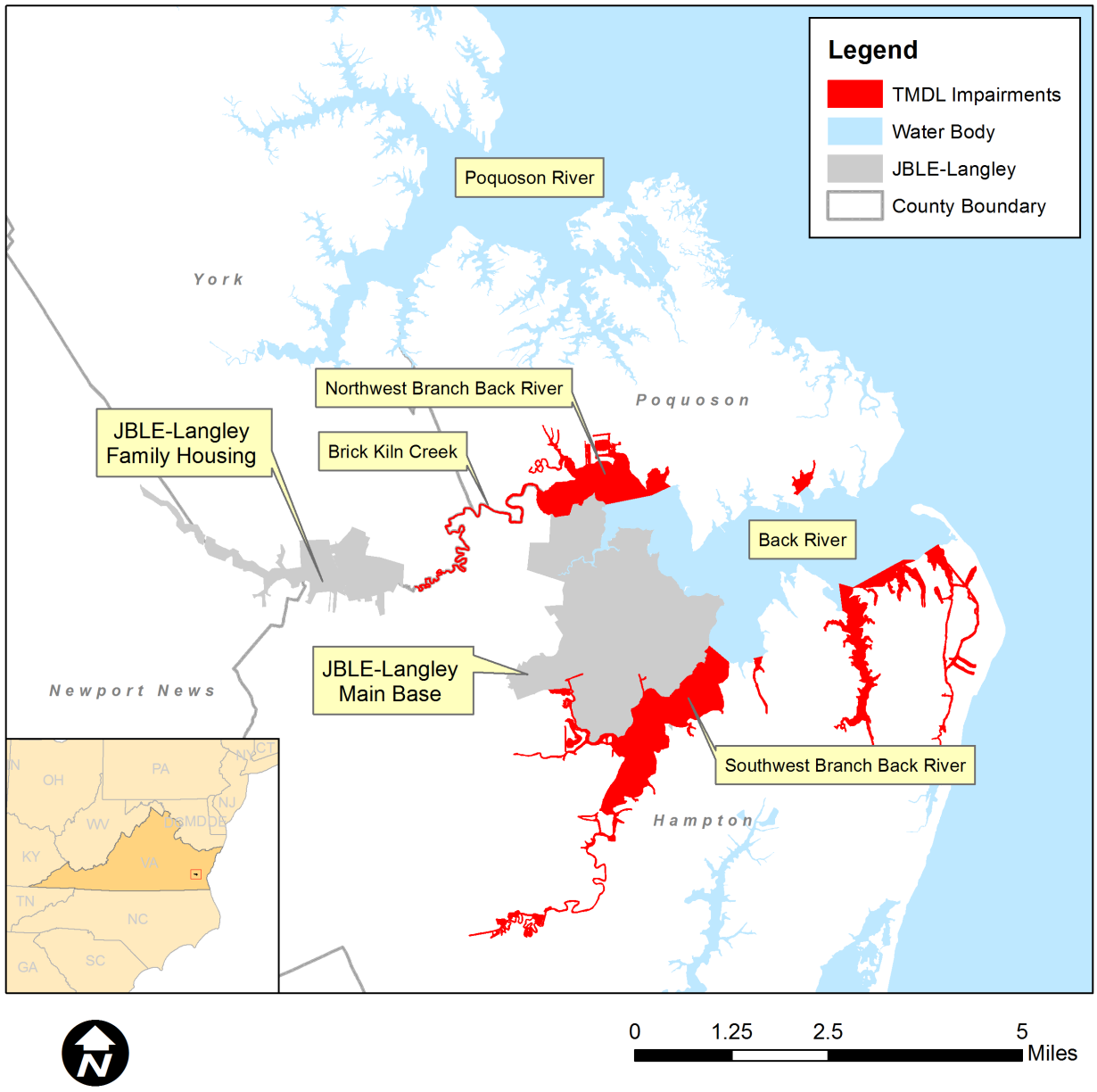


Figure 3-1. TMDL Watershed and JBLE–Langley Boundary

The 2017 TMDL report for Back River assigns an individual WLA to JBLE–Langley (VAR040140), presented in Table 3-1.

Table 3-1. JBLE–Langley Fecal Bacteria WLA and Assigned Percent Reduction for Back River

TMDL Year	TMDL Status	MS4 Entity Named in TMDL	Existing Load (cfu/yr)	Wasteload Allocation (cfu/yr)	Percent Reduction Assigned to Permitted Sources (%)
2017	Final	Langley Air Force Base	3.22E+13	3.02E+13	6.21%

Acronyms:
cfu/yr – Colony forming units per year.
WLA source: VDEQ, 2017a, Table 4.4.

The 2017 TMDL report used area occupied by the MS4 among other factors to determine the WLA. Table 3-2 provides MS4 area as presented in the TMDL report.

Table 3-2. Distribution of JBLE–Langley Impervious Area within the TMDL Watershed

TMDL Year	TMDL Status	MS4 Permit Holder	Jurisdiction	Area Occupied by MS4 (Acres)[1]
2017	Final	JBLE–Langley	JBLE–Langley	1,903

Note:
[1] The "Area occupied by MS4" was obtained from VDEQ, 2017a, Table 3.1.

4.0 BACTERIA CONTROL MEASURES – MCMs

Discharges from MS4s are regulated under the Virginia Stormwater Management Act, the Virginia Stormwater Management Program (VSMP) Permit regulations and the Clean Water Act as point source discharges. VDEQ issued MS4 Permit No. VAR040140 to JBLE–Langley which became effective on 01 November 2018. The MS4 permit requires JBLE–Langley to develop, implement and enforce an MS4 Program designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable in order to protect water quality. The MS4 permit serves as the legal authority of the base to implement measures aimed at reducing bacteria loads. The permit also requires the base to implement six MCMs or BMPs. A summary of the base's MCMs and how they can address the bacteria TMDLs is described below.

4.1 Public Education and Outreach

JBLE–Langley utilizes websites, email messages, newspaper articles, handouts and educational materials related to high-priority water quality conditions identified in the program plan including fecal bacteria and distributes them at locations where members of the target audience are anticipated to be (e.g., World Water Day events, Earth Week/Day events, car wash events and family housing). Handouts include pamphlets or other one-page informational sheets that present information and provide a means to contact the Stormwater Program Manager with any questions or comments. Educational materials include brochures on pet wastes and outdoor car washing practices that are distributed during events such as World Water Day or family housing resident meetings. Education and outreach information is also conveyed through the base website[1], Facebook page and the Langley Family Housing[2] Facebook page. Examples of stormwater pollution prevention educational material that are distributed at local events or posted on base are presented in Figure 4-1 to Figure 4-3. The Pet Waste Pollution and Prevention Brochure (Figure 4-1) and the Outdoor Vehicle Washing Brochure (Figure 4-2) are given to new residents of base housing and the Car Maintenance Brochure is handed out twice a year (Figure 4-3). Strategies for public education and outreach are summarized in the JBLE–Langley MS4 Program Plan (JBLE–Langley, 2021a).

[1] https://www.jble.af.mil/About-Us/Units/Air-Force/Langley-Environmental/
[2] http://www.langleyfamilyhousing.com/

Tips

Picking up pet waste is no one's favorite job.

Hopefully the tips below will make the job a little less icky.

- You can turn pet waste collection baggies inside out over your hand to use the bag as a glove when picking up the waste.
- Many pet owners prefer to double bag the collected pet waste.
- After collection, you can tie the baggies onto the leash so that you do not have to hold or put the full baggie in your pocket.
- Long handled pet waste scoopers are available at pet stores to assist with waste collection.
- Although you can purchase baggies specifically for pet waste at pet stores, you can also re-use other bags including newspaper bags, bread bags, or sandwich baggies.
- Pet waste digesters are available for purchase at pet stores.

Additional Information

For more information, contact a Joint Base Langley Eustis Water Program Manager at 757-878-5218 (Fort Eustis) or 757-764-1141 (Langley AFB).

Additional information is available at:

EPA Pet Waste Management:
https://cfpub.epa.gov/npstbx/files/Pet%20Care%20Fact%20Sheet.pdf

City of Hampton
http://www.hampton.gov/DocumentCenter/View/9075

Hampton Roads
www.hrpdcva.gov/departments/water-resources/stormwater-management

http://askhrgreen.org/scoop-the-poop/

Water Environment Federation
www.wef.org/AWK/pages_cs.aspx?id=6392

Pet waste is a health risk to people, other pets, and the environment. Bacteria in pet waste can make people sick. When not disposed of properly, pet waste is washed into storm drains and ends up in local waterways.

Always bag pet waste and dispose of it properly.

Preventing Pollution from Pet Waste

April 2016

The Problem

Pet waste is not only smelly and unsightly, but also is a health risk to pets, people, and our local water bodies.

You may think that pet waste left on a lawn or sidewalk fertilizes the soil. However, in most cases the waste is washed into storm drains that lead directly into nearby waterways without being treated first.

The problem is that pet waste contains harmful bacteria such as E. coli and fecal coliform, making the water unfit for irrigation, recreation (such as swimming, fishing, or tubing), and other uses.

Pet waste contains parasites and bacteria that can spread gastrointestinal illnesses in humans such as Giardia and Salmonella.

These pollutants are harmful to the thousands of species of plants and animals (including fish, crabs and shellfish, birds, grasses, mammals, reptiles, and amphibians). People who eat food from contaminated water can get very sick.

Furthermore, pet waste also contains nutrients that can cause excessive algae growth in water, leading to fish kills and disrupting the water's natural ecology.

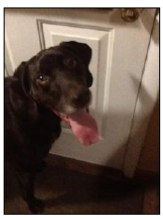
The Facts

Pet waste contains contaminants that are harmful to people, pets, wildlife, and the environment.

Some of the harmful effects of pet waste include:

- When pet waste decays, it uses up dissolved oxygen and releases compounds that are harmful to fish and other aquatic life.
- On average nationally, there are 0.58 dogs per household.
- Each dog produces approximately 0.42 pounds of fecal waste per day, or about 150 pounds per year. Just think how much waste is produced by the pets in your neighborhood!
- A single gram of pet waste contains an average of 23 million fecal coliform bacteria that can cause disease in humans.
- A single day's waste from one large dog can contain 7.8 billion fecal coliform bacteria—enough to close 15 acres of shellfish beds.
- EPA estimates that 2 to 3 days of pet waste from a population of 100 dogs would contribute enough bacteria and nutrients to temporarily close an entire bay for swimming and shellfishing..

Source: EPA 1993



The Solution

Be responsible and clean up after your pets. It is as easy as 1-2-3:

1. Bring a bag.

2. Use a bag to pick up pet the waste.

3. Dispose of the bag properly in the trash...

Figure 4-1. JBLE–Langley Pet Waste Pollution Prevention Brochure

The Impact of Car Washing on Our Rivers and Bay...

When we wash the grime off our cars, it flows down the street and into the storm drain. This runoff carries soap, sediment, oil, and grease. Once the runoff gets into the storm drainage piping system, it directly discharges without treatment into the nearest lake, river, harbor, or bay.

...and Why It Matters

Polluted stormwater can harm fish, wildlife, and plants, and it can even contaminate drinking water. The U. S. EPA estimates that at least 50% of our nation's water pollution is caused by polluted stormwater runoff. If every vehicle (some 2.3 million) in the U.S. was washed once a month with 25 gallons of water (5 buckets), over 70.5 billion gallons of polluted water could enter the stormwater system every year. You can help. Use the tips provided in this brochure to help ensure that our waterways remain clean.

The Law

Joint Base Langley Eustis is required to obtain a stormwater permit under the Virginia Pollutant Discharge Elimination System, or VPDES. The goal of this permit is to reduce pollutants found in storm water runoff from urbanized areas to the "maximum extent practicable."

Joint Base Langley Eustis has prepared this educational brochure to meet a requirement of their VPDES permit administered by the Virginia Department of Environmental Quality.

Contact Information

For more information, contact a Joint Base Langley Eustis Water Media Manager at 757-878-5218 (Fort Eustis) or 757-764-1141 (Langley AFB).

For additional information, see the Commonwealth of Virginia's VPDES Permits, Fees and Regulations website at:

http://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/VAG75FactSheet2012.pdf

Environmental Protection Agency's information on vehicle washing:

https://cfpub.epa.gov/npstbx/files/KSMO_CarWashing.pdf

Florida DEP's Best Practices for Mobile Vehicle Washing:

http://www.dep.state.fl.us/water/wastewater/iw/docs/bmps4mobile-vehicle-washing.pdf

Outdoor Vehicle Washing

May 2016

Mobile Car Washes: Legal Requirements

Discharges from mobile car washes to the storm sewer system are not allowed at Joint Base Langley Eustis. Owners of mobile vehicle washes may apply for coverage under a permit issued by the Virginia Department of Environmental Quality; however the usual mode of operation for these operations is to prevent the discharge of wash waters to surface waters or the storm sewers. Permit coverage as a mobile operator would require each discharge location to be identified on the registration statement as a separate outfall.

JBLE and DEQ urge mobile car wash owners to avoid a discharge to state waters or storm drains by applying technologies to collect wash water and dispose of it properly, recycle it, or use best management practices (evaporation, blocking storm drain entrances, use of permeable surfaces, etc.). Many ideas to avoid a discharge are covered in this brochure and available online.

Car Washing at Home and for Charity

Washing personal vehicles at home or at a volunteer/ charity event is not regulated. Thus, runoff from these activities does not need to be captured by recycling or catchment devices. Even so, there are several easy ways to help reduce stormwater pollution while you work:

- If possible, use a commercial car wash.
- Commercial car washes have recycling systems or discharge to the sanitary sewer system, which goes to a treatment plant.
- Wash your car on gravel, grass, or other permeable surfaces. These surfaces serve as a filter or a sponge, trapping pollutants from the wash water.
- Block off the storm drain inlets during charity car wash events or use an inlet insert to catch wash water.
- Divert soapy water from car washes into a sanitary sewer drain. If this is not feasible, divert car wash water onto grass or landscaping to provide filtration.
- Use hoses with nozzles that automatically turn off when left unattended.
- Use only biodegradable soaps.

Using these simple rules at home and for charity events helps keep a clean and healthy living environment. This is not only good for us and future generations, it makes for a healthy ecosystem.

The Best Option

Outdoor car washing has the potential to result in high loads of nutrients, metals and hydrocarbons during dry weather conditions in many watersheds, as the detergent-rich water used to wash the grime off our cars flows down the street and into the storm drain.

Car washing is a common routine for residents and a popular way for organizations such as scout troops, schools, and sports teams to raise funds. This activity is not limited by geographic region, but its impact on water quality will be greatest in more urban areas with higher concentrations of automobiles.

Always consider using a commercial car wash as your first alternative. A properly designed car wash is connected to a sanitary sewer that carries the dirty water to a wastewater treatment plant. Trading a few dollars for a healthy stormwater system is one deal that everyone can live with.

Figure 4-2. JBLE–Langley Outdoor Vehicle Washing Brochure

Figure 4-3. JBLE–Langley Car Maintenance and Pollution Prevention

JBLE–Langley residents are permitted to have pets and it is reasonable to assume that residents walk their dogs around nearby neighborhoods. Pet waste disposal stations (Figure 4-4) have been installed and are maintained by Langley Family Housing staff, the private real estate company that manages JBLE–Langley housing. As described in the base's MS4 Program Plan (JBLE–Langley, 2021a), residents with pets are briefed on the importance of proper pet waste disposal and the impact on stormwater and water quality.

JBLE–Langley maintains a military dog training center and associated dog kennels. Dog training areas are covered with artificial turf and are surrounded by vegetated buffers that provides filtration of pollutants prior to entering surface waters. The JBLE–Langley horse stable is privatized through the Saddle Club and encompasses approximately 15 acres including a horse stable, boarding facility and pasture. Stable bedding and manure associated with the stable are contained under cover and club members are informed of the importance of minimizing exposure to stormwater. Potential sources of bacteria in runoff from both the dog training center and horse stable are addressed through stormwater treatment practices and training as described here and in the MS4 Program Plan (JBLE–Langley, 2021a).

Figure 4-4. Pet Waste Sign at the JBLE–Langley Marina on Southwest Branch Back River

4.2 Public Involvement/Participation

JBLE–Langley engages the public through its website and social media presence across Facebook and Twitter. The base has hosted several local events to raise awareness and facilitate public involvement on the topics of reducing pollutants in stormwater, improving water quality and supporting local restoration and clean-up projects.

Each year, the base holds a series of events, such as Clean the Bay Day, America Recycles Day, Earth Day/Week and annual Base Clean-Up Day, to help mobilize volunteers to participate in clean-up efforts across the base. Due to the COVID-19 pandemic some of these events could not safely be conducted while maintaining safe protective measures against the virus. However, for Earth Day/Week in 2021 the base distributed stormwater related material and conducted some in-person events including a nature trail cleanup, in which 80 pounds of trash and 70 pounds of wood was collected and disposed, and a cleanup of Brick Kiln Creek, where 300 pounds of trash was collected (Figure 4-5). The base also hosted World Water Day in 2021 where pet waste and other stormwater brochures were distributed at the Base Exchange (Figure 4-6).

In previous years, typical volunteer activities included cleanout of stormwater ditches and drains (Figure 4-5), Earth Day Community Awareness Fun Fair with interactive stormwater displays, stormwater workshop at Booker Elementary school, and rain-barrel construction and maintenance workshop. Activities, such as storm drain marking and community involvement, can help reduce the levels of pollutants such as fecal bacteria before they enter the storm drains and flow to the receiving stream. Strategies for public involvement and participation are summarized in the JBLE–Langley MS4 Program Plan (JBLE–Langley, 2021a).

Figure 4-5. JBLE–Langley Earth Day Cleanup of Brick Kiln Creek

Figure 4-6. JBLE–Langley Brochure Announcing Dog Waste Bag Distribution for World Water Day

In June 2017, JBLE–Langley partnered with the Chesapeake Bay Foundation and Booker Elementary school to implement an oyster reef restoration project in the Back River near the base marina. Oyster reefs form a complex ecosystem for filter feeders that filter bacteria and other pollutants from the water column. Through this project, 75 bushels of oyster shells and 2,000 young oyster spat were used to begin building the reef habitat. This project also helped to educate children on the role oysters play in filtering pollutants, improving water quality and providing habitat within the Back River and Chesapeake Bay (Figure 4-7 and Figure 4-8). In August 2018, and again in June 2019, the base expanded the reef habitat through oyster reef building workshops, involving both elementary school students and base residents. These classes was led by instructors from the Chesapeake Bay Program (Figure 4-9). Due to COVID restrictions this event could not be conducted in 2020 or 2021; however, a power point presentation on the benefits of oyster reef restoration was provided by the base to Booker Elementary and the base taught a part of the class curriculum. The base plans on resuming the oyseter reef restoration project in future years when COVID restrictions are lifted.

Figure 4-7. Oyster Reef Construction in the Southwest Branch Back River near the JBLE–Langley Marina with Students from Booker Elementary School (June 2019)

Figure 4-8. Oyster Reef at JBLE–Langley Filters Pollutants, Improves Water Quality and Provides Habitat within the Southwest Branch Back River

Figure 4-9. JBLE–Langley Oyster Gardening Outreach Event

4.3 Illicit Discharge Detection and Elimination (IDDE)

The JBLE–Langley IDDE program is designed to help detect, identify and address non-stormwater discharges to the stormwater network. Non-stormwater discharges include untreated sewage that contain fecal bacteria. To help detect and identify illicit discharges, the base regularly screens outfalls to determine if any non-runoff related discharges are occurring. Dry weather screening is conducted on non-industrial outfalls annually as outlined in the IDDE Procedure Manual. Additionally, any sanitary sewer overflows that occur are tracked and immediately addressed.

Figure 4-10. Non-Stormwater Discharge Monitoring at JBLE–Eustis

In 2017, JBLE–Langley replaced sanitary sewer piping and spent approximately $1.3 million dollars on sanitary sewer repairs to reduce infiltration and inflow. In addition, the primary force main that services most of the base has been redesigned and is planned for construction. These efforts assist in reducing the occurrence of sanitary sewer overflows. IDDE inspections were conducted during 2020-2021. Initiatives planned for 2021-2022 include continued inspections of non-industrial outfalls and investigation and reporting of potential illicit discharges. Details on the IDDE program and procedures used to identify illicit discharges are provided in the JBLE–Langley IDDE Procedures Manual (JBLE–Langley, 2017a). Additional detail on IDDE initiatives is presented in the JBLE–Langley MS4 Program Plan (JBLE–Langley, 2021a).

4.4 Construction Site Stormwater Runoff Controls

JBLE–Langley addresses Stormwater Management and Erosion and Sediment Control for design, construction, maintenance and management of the base's facilities through Section 01 12 00 Environmental Management Special Conditions and Simplified Acquisition of Base Engineer Requirements (SABER) General Provisions. All construction contractors must comply with Section 01 12 00 Special Conditions and SABER General Provisions. The JBLE–Langley construction site stormwater runoff program is designed to verify that a Virginia Erosion and Sediment Control Plan (VESCP) can meet the applicable erosion prevention criteria (see 9VAC25-840-40, renumbered from 4VAC50-30-40). Reducing sediment in runoff from construction sites can help reduce bacteria levels, since bacteria are often bound to sediment. Additional details on construction site stormwater runoff controls for JBLE–Langley are presented in the MS4 Program Plan (JBLE–Langley, 2021a).

4.5 Post-Construction Stormwater Management

The JBLE–Langley post-construction stormwater management program helps reduce pollutants in runoff from new development and redevelopment projects across the base through stormwater control measures (SCM). Many stormwater SCMs, such as bioretention and dry extended detention ponds, can reduce the level of pollution for multiple pollutants, including nutrients, sediment and fecal bacteria by filtering pollutants from runoff before they reach surface waters.

During 2020-2021, JBLE–Langley performed a comprehensive inventory and inspection of existing SCMs to assess and prioritize maintenance and retrofit opportunities. Field crews evaluated SCM retrofit opportunities using maps of existing SCMs, retrofit checklists and a list of removal efficiencies for each SCM type from the Chesapeake Bay TMDL Action Plan Guidance Document (VDEQ, 2021). General retrofit opportunities include removing sediment, debris and undesired vegetation, maintaining desirable vegetation, dredging SCMs within their existing footprint to increase volume storage, laying back the swale side slopes to improve treatment and redesigning dry detention ponds with high water tables to constructed wetlands (JBLE–Langley, 2021c).

During 2020-2021 the base cleaned out six stormwater SCMs, which included removing invasive and undesirable vegetation.

4.6 Pollution Prevention and Good Housekeeping

The JBLE–Langley MS4 Program Plan outlines the requirements for MCM 6, Pollution Prevention/Good Housekeeping for Municipal Operations, in Section 3.6.1. Requirements include:

- Development and implementation of written procedures to prevent pollutant discharge from daily operations
- High priority MS4 facility stormwater pollution prevention plan (SWPPP) development
- Turf and Landscape Nutrient Management Plan (NMP) development and implementation

- The prohibition of deicing agents containing urea or other forms of nitrogen or phosphorus
- Provision of employee training

As part of the base's pollution prevention and good housekeeping program, JBLE–Langley develops and implements SWPPPs for high priority MS4 facilities and provides pollution prevention training for staff. The base also developed the Standard Operating Procedures and Good Housekeeping Procedures in July 2017 to minimize the use of pollutants that may enter the stormwater drainage system. High priority SWPPP training was developed for JBLE–Langley personnel in April, 2020. Training on topics such as illicit discharges, good housekeeping and pollution prevention practices, pesticide application, sediment and erosion control regulations and spill response is also provided to JBLE–Langley personnel and contractors, as applicable. Training on proper handling and disposal of waste streams that may contain fecal bacteria can help reduce the levels of bacteria delivered to receiving streams. Strategies for public education and outreach are summarized in the JBLE–Langley MS4 Program Plan (JBLE–Langley, 2021a).

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5.0 BACTERIA CONTROL MEASURES – BEYOND MCMs

In addition to the MS4 permit MCMs, JBLE–Langley will evaluate and implement additional control measures designed to reduce fecal bacteria loads within the Back River watershed. The following sections summarize the base's plan to identify and prioritize bacteria "hot spots" and implement targeted BMPs to reduce sources of bacteria.

5.1 Pollutant Source Assessment

Fecal bacteria can originate from multiple sources. The 2017 VDEQ TMDL report identifies both natural and anthropogenic sources of bacteria in the Back River watershed as presented in Table 5-1.

Table 5-1. Fecal Bacteria Source Allocations (%) in the Back River Watershed (Source: VDEQ 2017a, Table 3.7)

Source Category	Source	Percent
Wildlife	Deer	4.3
	Ducks/Birds	43.2
	Muskrats	0.6
	Nutria	1.3
	Racoons	0.3
Human	Human-SSO	6.1
	Human-Septic	0.0
	Marina (slips)	0.4
Livestock	Livestock	9.0
Pets	Dog	34.6

The values presented in Table 5-1 are averages across the Back River watershed. To build on this information, JBLE–Langley conducts an annual evaluation of local fecal bacteria sources with the goal of identifying potential pollutant "hot spots" or sources across the base. The evaluation conducted in 2021 included field assessments of potential point and nonpoint sources of bacteria, including wildlife, horse stables, the dog training center and associated dog kennels and resident housing area. The evaluation also included interviews with base staff to identify stormwater and bacteria-reducing practices currently used by the base as well as to determine additional strategies that would improve bacteria reduction on the base. The evaluation determined that the base continues to implement many of the bacteria-reducing strategies required by Section II.B.4 in the MS4 permit. Findings from the source assessment include:

- The base actively manages bird and animal populations and minimal wildlife was observed during the source assessment.
- No human sources of bacteria were identified.
- Pet sources continue to be controlled through BMPs at the horse stables, pet waste stations in residential areas and a pet waste station at the marina. Opportunities for improving bacteria

reduction at horse stables and pet waste stations may include riparian management to prevent wash off of fecal bacteria into streams.

- Illicit discharges and sewer line leaks into the MS4 are being monitored through the IDDE program. Opportunities to improve strategies on illicit discharge prevention may include public education programs on the environmental impacts of dumping materials.

5.2 Additional Control Measures

JBLE–Langley has implemented a number of additional control measures to address sources of fecal coliform on the base. Over the past seven years, JBLE–Langley has completed 9,295 linear feet of shoreline stabilization along the eastern and southeastern shorelines of the Back River and Southwest Branch Back River (Figure 5-1). JBLE–Langley constructed an additional 1,566 linear feet of stabilization in 2020 along portions of the Southwest Branch Back River near the marina. An additional 8,550 feet of restoration is planned for 2021-2022. These areas of stabilization increase resilience to major storm events and flooding, provide habit for native animals and plants and reduces erosion and suspension of sediment and associated bacteria in the Back River and Chesapeake Bay.

Figure 5-1. Shoreline Stabilization Along the Back River

The "Marker 27" is a recreation boat marina used by members of the JBLE–Langley community. On 15 September 2017, a new boat sewage pump-out station was installed at the marina. When properly utilized by boat owners, this device will help to minimize sewage leaks and associated bacteria inputs to the Southwest Branch Back River and Back River.

Controlling fecal bacteria loads from wildlife can be challenging. In managing the bases' runway protection zone and clear zone, JBLE–Langley works with the United States Department of Agriculture, Natural Resource Conservation Service to relocate deer, coyotes, large birds, cats and other animals. The base also removes wetlands surrounding airfields that would attract wildlife and present bird/animal aircraft strike hazard (BASH) safety concerns.

Public education content with an emphasis on fecal bacteria pollution awareness will continue to be developed and distributed through various channels. Education will continue to be an important component of future strategies to reduce bacteria loading. Opportunities for improvements and preventative maintenance to the sanitary sewers and storm sewers will be evaluated. Additionally, JBLE–Langley will use the results from the fecal bacteria source assessment to guide future BMP site selection and prioritization.

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6.0 BMP IMPLEMENTATION SCHEDULE AND ASSESSMENT

6.1 Implementation Schedule

The base will implement the fecal bacteria load reducing components described in Sections 4.0 and 5.0 of this Action Plan. The base is currently in year 3 (01 November 2020 – 31 October 2021) of its second MS4 permit term. In subsequent years, the base plans to refine its initial assessments of potential sources and control measures, with the goal of improving resource allocation across the installation. Table 6-1 outlines the implementation plan for bacteria controls at JBLE–Langley as it moves forward into the second MS4 permit cycle.

Table 6-1. Implementation Schedule for Addressing Bacteria Impairments

Permit Year	Actions
First Permit Cycle (03 August 2017 – 31 October 2018)	• Reviewed the final Back River Bacteria TMDL report approved by United States Environmental Protection Agency (EPA) to identify actions to address sources of bacteria.
	• Developed the Bacteria TMDL Action Plan and implementation schedule (JBLE–Langley, 2018).
	• Identified and maintained a list of existing source controls and management practices that are applicable to reducing fecal coliform bacteria.
	• Identified opportunities for enhancing education and outreach programs to address bacteria impairment.
	• Assessed significant sources of bacteria using desktop evaluations, field investigations and collaboration with key base staff.
	• Determined if additional source controls are needed. Prepared a summary of potential controls and identified programs and activities to support their implementation.
	• Evaluated new bacteria-related datasets for the watersheds collected by other agencies (e.g., VDEQ) as available.
Second Permit Cycle (01 November 2018 – 31 October 2023)	• As funding permits, implement activities identified in the implementation schedule (from previous years) as appropriate.
	• Evaluate new bacteria-related datasets for the watersheds collected by other agencies (e.g., VDEQ) as available.
	• Identify any current or additional activities to be performed during the subsequent permit cycle.
	• Update the Bacteria TMDL Action Plan to reflect activities performed during the year. Adjust the implementation schedule as needed to reflect findings from field and desktop assessments. Report on progress annually.
	• Submit an estimated end date for achieving the bacteria WLAs.

6.2 BMP Effectiveness Assessment

The base will implement the fecal bacteria load reducing components described in Sections 4.0 and 5.0 of this Action Plan. As bacteria load reducing measures are implemented and evaluated, opportunities for improving or enhancing their effectiveness will be evaluated on an annual basis. An assessment of the bacteria control measures will be conducted through the MS4 Annual Report, which documents progress toward implementing the MCMs and the TMDL special conditions identified in the MS4 permit.

7.0 REFERENCES

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