



**FINAL**  
**Warwick River and Skiffes Creek**  
**Bacteria Total Maximum Daily Load Action Plan**

JBLE-Eustis, Virginia

Permit Year 3: 1 July 2020 - 30 June 2021



JBLE-Eustis  
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**LIST OF ABBREVIATIONS AND ACRONYMS**

AFCEC	Air Force Civil Engineer Center
ATSC	Army Training Support Center
BASH	Bird/Animal Aircraft Strike Hazard
BMP	Best Management Practice
CED	Civil Engineer Division
cfu/yr	Colony Forming Units per Year
EPA	Environmental Protection Agency
IDDE	Illicit Discharge Detection and Elimination
JBLE–Eustis	Joint Base Langley-Eustis – Eustis
JRRF	James River Reserve Fleet
MARAD	Maritime Administration
MCM	Minimum Control Measure
MFH	Military Family Housing
MS4	Municipal Separate Storm Sewer System
NCO	Non-Commissioned Officer
NMP	Nutrient Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TRADOC	Training and Doctrine Command
TSE	Training Support Enterprise
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) *1998 303(d) Total Maximum Daily Load Priority List and Report* listed Warwick River and Skiffes Creek as not supporting their designated use for shellfish harvesting due to fecal coliform bacteria standards violations. In 2008, the United States Environmental Protection Agency (EPA) approved Total Maximum Daily Loads (TMDL) for Warwick River and Skiffes Creek to address excess fecal coliform bacteria in these waterbodies (VDEQ, 2007). The TMDL report assigned individual wasteload allocations (WLA) for bacteria to the city of Newport News, York County, and Joint Base Langley-Eustis – Eustis (JBLE–Eustis). A TMDL is the maximum amount of a pollutant that a waterbody can assimilate and still support its designated use(s). A TMDL WLA is a portion of the TMDL load and represents the allowable load a permittee may discharge to the TMDL waterbody and still meet water quality standards. The WLA includes that portion of the TMDL that is assigned to permitted point sources such as Municipal Separate Storm Sewer Systems (MS4).

JBLE–Eustis is authorized to discharge stormwater from the installation in accordance with an industrial stormwater permit (Permit No. VA0025216) and an MS4 permit (Permit No. VAR040035), 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–Eustis. Special Condition 1 found in Section II.B.1 of the JBLE–Eustis MS4 permit requires the installation to maintain a specific TMDL Action Plan for pollutants allocated to the MS4 in an approved TMDL. On 30 November 2015, VDEQ notified JBLE–Eustis that, as part of maintaining its MS4 Program Plan, the installation is required to develop TMDL Action Plans for the Warwick River and Skiffes Creeks to address bacteria impairment in those waterbodies. Specifically, JBLE–Eustis (MS4 operator) must update the MS4 Program Plan to incorporate approvable TMDL Action Plans that identify the BMPs and other interim milestone activities. The TMDL Action Plans for the Warwick River and Skiffes Creek 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–Eustis. 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.

JBLE–Eustis is currently not an approved Virginia Stormwater Management Program (VSMP) authority. As stated in Part II.B.4.b of their MS4 permit, JBLE–Eustis is required to select and implement one source-specific strategy designed to reduce the load of bacteria to the MS4.

### **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 describes the TMDL waterbodies.
- Section 3.0 discusses the JBLE–Eustis installation.
- Section 4.0 describes the bacterial control measures that are applicable to the MS4 permit MCMs.
- Section 5.0 describes the additional bacterial 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–EUSTIS INSTALLATION

JBLE–Eustis, formerly Fort Eustis, is located adjacent to the City of Newport News, Virginia, which is part of the Norfolk, Hampton, and Newport News metropolitan area. The base is located on Mulberry Island, a small peninsula bordered by the James River to the west, Warwick River to the east, and Skiffes Creek toward the north. The base occupies approximately 8,000 acres and houses a variety of military organizations and support activities on the installation. Most of the development is located at the northern end of the base, while the southern portion of the peninsula remains largely undeveloped. A site location map is presented as Figure 2-1, and a summary of the base’s land use is presented in Table 2-1 (JBLE–Eustis, 2021a).



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



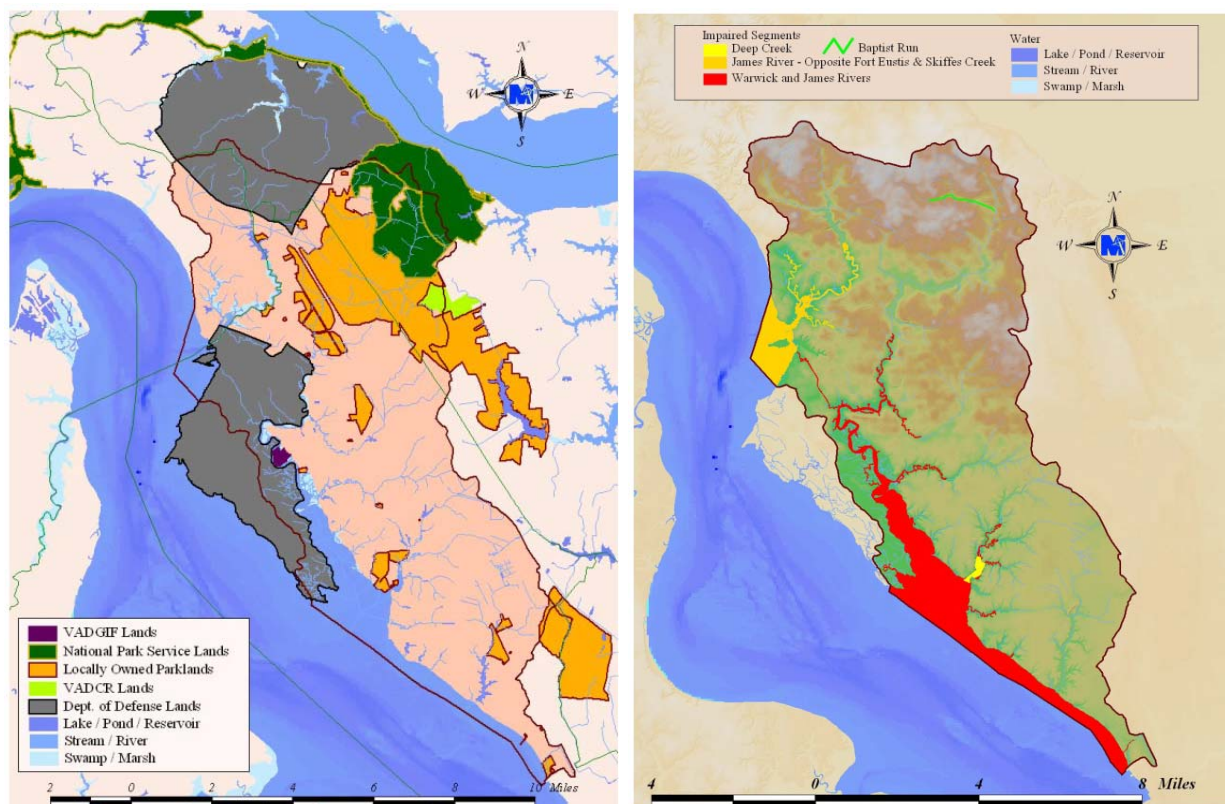
**Table 2-1. JBLE–Eustis Land Use Summary (JBLE–Eustis, 2021a)**

<b>Land Use</b>	<b>Area (Acres)</b>
Impervious	835
Pervious	1,424
Forest	2,304
Pasture	19
Natural Area	2,848
Water	524
<b>Total</b>	<b>7,954</b>

The base is the home of the Headquarters United States Army Training and Doctrine Command (TRADOC), the Army Training Support Center (ATSC), and the 7th Transportation Brigade (Expeditionary). TRADOC is responsible for developing, educating, and training soldiers and civilians; supporting unit training; and designing, building, and integrating capabilities, formations, and equipment. The ATSC is responsible for managing the Army Training Support Enterprise (TSE), which provides oversight for programs that enable development, delivery, and sustainment of training and education support capabilities. The 7th Transportation Brigade (Expeditionary) provides logistics support around the world for port, terminal, and watercraft units conducting expeditionary operations in support of land operations. Other units on the base include the Army Aviation Logistics School, Non-commissioned Officer's (NCO) Academy, Aviation Applied Technology Directorate, and the James River Reserve Fleet (JRRF). The JRRF, a tenant managed by the Maritime Administration (MARAD), leases land on base and maintains a number of vessels moored in the James River. The total population of the base is approximately 22,090 comprised of approximately 7,160 military personnel and 11,428 dependents living on base, as well as approximately 3,502 civilian non-residents who commute to the base daily.

### 3.0 TMDL WATERBODIES

The Warwick River and Skiffes Creek are located in the Lower James River Basin as illustrated in Figure 3-1. These two waterbodies are listed as impaired for fecal coliform bacteria, in violation of the Virginia Administrative Code (VAC) 9VAC25-260-160 and 9VAC25-260-170A water quality standard. The WLAs assigned to JBLE–Eustis for the impaired waterbodies are presented in Table 3-1.



**Figure 3-1. TMDL Watersheds and JBLE–Eustis Boundary**  
 (Source: VDEQ 2007, Figure 1.2 and Figure 1.3)

**Table 3-1. JBLE–Eustis Fecal Bacteria WLAs and Assigned Percent Reductions**

Waterbody Name	Wasteload Allocation (cfu/yr)	Percent Reduction Assigned to Permitted Sources (%)
Warwick River	2.52E+10	0%
Skiffes Creek	1.05E+10	0%

**Acronym:**  
 cfu/yr – Colony forming units per year

The 2008 TMDL report used the permittee’s impervious area among other factors to determine the WLA. Table 3-2 modified from the TMDL report lists the impervious area for the base, in relation to the total area of the base and the TMDL watershed areas.

**Table 3-2. Distribution of JBLE–Eustis Impervious Area within the TMDL Watersheds  
(Modified from VDEQ 2007, Table 5.1)**

<b>Waterbody Name</b>	<b>Watershed Acres<sup>1</sup></b>	<b>JBLE–Eustis Impervious Acres<sup>1</sup></b>	<b>Impervious Area (% of Base Area)<sup>2</sup></b>	<b>Impervious Area (% of Watershed Area)<sup>2</sup></b>
Warwick River	38,211	155.7	2.0%	0.4%
Skiffes Creek	8,540	21.9	0.3%	0.3%

**Notes:**

<sup>1</sup> Watershed Acres and JBLE–Eustis Impervious Acres were obtained from VDEQ 2007, Table 5.1.

<sup>2</sup> Impervious area (% of Base Area and % of Watershed Area) were calculated using a total JBLE–Eustis area of 7,954 acres.

## **4.0 BACTERIA CONTROL MEASURES – MCMs**

Discharges from MS4s are regulated under the Virginia Stormwater Management Act, the VSMP Permit regulations, and the Clean Water Act as point source discharges. VDEQ issued MS4 Permit No. VAR040035 to JBLE–Eustis which became effective on 01 July 2013. The reissuance of the permit for the second permitting cycle became effective on 01 November 2018. The MS4 permit requires JBLE–Eustis 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–Eustis develops 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., Earth Week/Day and World Water Day events, dog parks, military family housing [MFH], and Halloween events). Handouts include pamphlets or other one-page informational sheets that present information and also provide a means to contact the Stormwater Program Manager with any questions or comments. Additional education materials include posters that can be utilized during events such as Earth Week/Day or MFH resident meetings. Education and outreach information is also conveyed through the base’s website (<https://www.jble.af.mil/Units/Army/Eustis-Environmental>). Examples of stormwater pollution prevention educational material that are distributed at local events are presented in Figure 4-1 to Figure 4-2. Strategies for public education and outreach are summarized in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2021a).

### 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 Media 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://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](http://www.wef.org/AWK/pages_cs.aspx?id=6392)

[www.wef.org/blogs/blog.aspx?id=8780&blogid=17296](http://www.wef.org/blogs/blog.aspx?id=8780&blogid=17296)

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–Eustis Pet Waste Pollution Prevention Brochure



Figure 4-2. JBLE–Eustis Stormwater Pollution Prevention Educational Flyer


## 4.2 Public Involvement/Participation

JBLE–Eustis interacts with the public through its website and social media presence across Facebook, Instagram, and Twitter. The base communicates with installation personnel and residents via internal and external websites, the installation community cable channel, *The Warrior* newspaper, as well as regular interactions with various community groups. Locally, the base has hosted many events to raise awareness and facilitate public involvement with a host of environmental topics.

Each year, the base holds a series of events throughout Earth Week. These events help mobilize volunteers to participate in various clean-up efforts across the base. Due to the COVID-19 pandemic, however, some events that are typically part of Earth Week could not safely be conducted. Instead a variety of virtual and socially distanced in-person events were conducted centering around environmental education, aquatic life, and litter cleanup (Figure 4-3). In previous years, Earth Week events included activities such as storm drain marking, Filterra BMP tree box maintenance, and community interactive fairs, which can help reduce the levels of pollutants such as fecal bacteria before they enter the storm drains and flow to the receiving stream. Such events will likely be resumed in the future when they can be safely conducted.

In addition to Earth Week, the base typically holds a variety of other environmental events throughout the year. The base hosted a World Water Day event in 2021 in which dog waste bag holders and educational pamphlets were distributed (Figure 4-4). The base also organized an annual installation spring clean-up and a 6-month long plastic bag collection competition in 2021. While unable to do so this year due to the

COVID-19 pandemic, the base also typically hosts Clean the Bay Day, in which it teams with a local Boy Scouts Troop and other volunteers to pick up trash at Eustis Lake. In addition to these events, the base maintains an illicit discharge reporting hotline, promotes participation in America Recycles Day, and promotes stormwater pollution prevention education via social media applications.







## JBLE-Eustis Earth Week Events 19-23 April 2021

**Come celebrate!**

### Virtual Options



**Presentations via MS TEAMS:**  
19 & 23 Apr (0900-1100 hrs) –  
*Tick Awareness & Reducing Mosquito Breeding*



**Nature Photography Contest:**  
*Submission Deadline - 22 Apr*





### In-person Options

**Turtle Survey:**  
20 Apr (0830-1200 hrs)



**Big Butts Campaign & Litter Cleanup Event:**  
22 Apr (0900-1100 hrs)

**Educational Field Trip:**  
21 Apr (0900-1130 hrs) or (1300-1530 hrs) -  
*Comparison of mature woodland and early successional habitats*



Registration details and forms are located at the 733 CED/CEIE webpage: <https://www.jble.af.mil/Units/Army/Eustis-Enviromental/>

Figure 4-3. Earth Week Activities Conducted at JBLE–Eustis



 **WORLD WATER DAY –  
22 MARCH 2021**

**What:** JBLE-Eustis Doggie Waste Bag Holder Give Away  
*(Includes Bags and Flashlight)*

**Where:** Balfour Beatty Community Center  
126 Madison Avenue  
Fort Eustis, VA

**When:** 22 March 2021, 11:00 am – 1:00 pm

**Who:** For you and Fido! Or grab one for a neighbor who needs a gentle reminder.

**Why:** Pet waste contains high levels of bacteria. When it rains, this bacteria is washed into nearby waterways and storm drains, ultimately making its way into the James River. Bacteria in waterways can negatively impact wildlife and be harmful to human health. Picking up after your pet is an easy way to reduce this form of pollution, thereby improving water quality in the James River and surrounding tributaries.



**SCOOP THE POOP...IT'S YOUR ENVIRONMENTAL DOODY!**



**Conserve Today. Secure Tomorrow.**  
Environmental Element, CED  
Joint Base Langley-Eustis  
(757) 878-4123

**Figure 4-4. World Water Day Flyer at JBLE-Eustis**

The installation participates in the Air Force’s Community Partnership Initiative, or Public-Public, Public-Private (P4) Partnership Initiative. The P4 Partnership Initiative seeks to identify and develop opportunities to share resources, increase efficiency, and improve effectiveness of operational, educational, and recreational programs. The JBLE–Eustis P4 Partnership is currently focused on the Virginia peninsula and includes a partnership with the City of Newport News to pick up and dispose of yard waste from JBLE–Eustis. Additional strategies used by the base for public involvement and participation are summarized in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2021a).

### 4.3 Illicit Discharge Detection and Elimination (IDDE)

The JBLE–Eustis 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 (see Figure 4-5). Additionally, any sanitary sewer overflows that occur are tracked and immediately addressed. IDDE inspections were conducted during 2020-2021. Initiatives planned include continued inspections of non-industrial outfalls and investigation and reporting of potential illicit discharges. Detail on the IDDE program is provided in the JBLE–Eustis IDDE Procedures Manual (JBLE–Eustis, 2016a). Additional detail on 2021-2022 IDDE initiatives is presented in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2021a).



**Figure 4-5. Non-Stormwater Discharge Monitoring at JBLE–Eustis**

### 4.4 Construction Site Stormwater Runoff Controls

The JBLE–Eustis 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. JBLE–Eustis has developed *Standards and Specifications for Erosion and Sedimentation Control* that provide guidance on compliance with Virginia erosion and sediment control requirements (JBLE–Eustis, 2016b). Additional detail on erosion and sediment control related activities on the base can be found in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2021a).

#### **4.5 Post-Construction Stormwater Management**

The JBLE–Eustis 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 SCMs such as bioretention and dry extended detention ponds can reduce the level of pollution for multiple pollutants, including nutrients, sediment, and fecal bacteria. In 2020 the installation conducted a performance assessment of all SCMs on the base. During 2020-2021 twenty-one structural SCMs that received a poor grade during the 2020 inspection were cleaned out. The installation will continue to build upon its post-construction stormwater management program through inspection, maintenance, and implementation of new SCMs.

#### **4.6 Pollution Prevention and Good Housekeeping**

The JBLE–Eustis 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
- Provision of employee training
- Development and implementation of Erosion and Sediment Control Standards and Specifications

As part of the base’s pollution prevention and good housekeeping program, JBLE–Eustis develops and implements SWPPPs for high priority MS4 facilities and provides pollution prevention training for staff. Training on topics such as municipal solid wastes, recycling materials, hazardous materials, hazardous wastes, non-hazardous wastes, universal wastes, hazardous substances, and spill response is also provided to JBLE–Eustis personnel. Training on proper handling and disposal of waste streams that may contain fecal bacteria can help reduce the levels of bacteria delivered to receiving stream. Strategies for public education and outreach are summarized in the JBLE–Eustis MS4 Program Plan (JBLE–Eustis, 2021a).

## 5.0 BACTERIA CONTROL MEASURES – BEYOND MCMs

In addition to the MS4 permit MCMs, JBLE–Eustis will evaluate and implement additional control measures designed to reduce fecal bacteria loads within the Warwick River and Skiffes Creek watersheds. 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 2007 VDEQ TMDL report identifies both natural and anthropogenic sources of bacteria in the Warwick River and Skiffes Creek watersheds as presented in Table 5-1.

**Table 5-1. Fecal Bacteria Source Allocations (%) in the TMDL Watersheds  
(Source: VDEQ 2007, Table 2.8)**

Watershed	Wildlife	Human	Livestock	Pet
Warwick River	18	35	23	24
Skiffes Creek	3	21	36	40

The values presented in Table 5-1 are watershed averages across multiple MS4s. To build on this information, JBLE–Eustis conducted a local fecal bacteria source assessment in February 2021 with the goal of identifying potential pollutant “hot spots” or sources across the base. This evaluation included field assessments of potential point and nonpoint sources of bacteria, including wildlife, the community dog park, horse stables, and resident housing area. The evaluation also included interviews with base staff to identify stormwater and bacteria-reducing practices currently used by the base and as well as to determine additional strategies that would improve bacteria reduction on the installation. 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.
- Livestock and 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 community dog park. Opportunities for improving bacteria-reduction at these facilities may include stormwater controls and 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.

- The base urges residents to use commercial car washing facilities where wash waters are prevented from entering the storm sewer system. Opportunities to further reduce bacteria wash-off may include public education programs on the environmental impacts of car washing.

## 5.2 Additional Control Measures

A community dog park was opened at JBLE–Eustis in May 2015. Access to the dog park is restricted, and residents must apply, register pets, pay a registration fee, and sign a receipt acknowledging the rules of the dog park. The area is fenced and equipped with a cypher lock. The rules include a requirement for owners to clean-up after their dogs. Signs are posted inside the dog park, and dog waste bags are provided near the trash can for pet waste disposal. Pet waste bag dispensers (Figure 5-1) are made available to residents throughout the year and distributed at environmental awareness events.



**Figure 5-1. Pet Waste Bag Dispenser**

The installation also operates horse stables for authorized personnel to utilize. Stable bedding and horse manure are collected by patrons and stored in a roll-off bin located on site, and then disposed of by a contractor offsite. During periods of good weather, horses are allowed to utilize the areas designated as pasture lands and categorized as agricultural land use. Manure generated in these areas is not collected.

In addition to these areas, residents of MFH are allowed to have pets, and it is reasonable to assume that residents periodically walk their dogs around nearby neighborhoods. Residents are required to clean up after their dogs; however, pet waste disposal receptacles are not available along the walking paths, and this is noted for possible future implementation.

Controlling fecal bacteria loads from wildlife can be challenging. The southern portion of the base (located in the Warwick River watershed) is largely undeveloped and therefore is prime wildlife habitat. The TMDL report noted that prime raccoon habitat covers a large portion of the base that lies within the Warwick River watershed (Figure 5-2). In developed areas in the northern part of the base, implementing “No Mow” buffer zones around natural and constructed ponds can deter geese from landing, foraging, and contributing to the bacteria problem. The base also removes wetlands surrounding airfields that would attract wildlife and present bird/animal aircraft strike hazard (BASH) safety concerns. Removal of wetlands reduces habitat for waterfowl and other wildlife that have the potential to contribute bacteria to the Warwick River.



**Figure 5-2. Map of Raccoon Habitat within the TMDL Watersheds  
(Source: VDEQ 2007, Figure 4.7)**

Public education content with an emphasis on fecal bacteria pollution awareness will 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–Eustis 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 permit year 3 (01 July 2020 – 30 June 2021) of its second MS4 permit. 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 plan for bacteria assessment activities and controls in the second MS4 permit cycle.

**Table 6-1. Implementation Schedule for Addressing Bacteria Impairments**

Permit Year	Actions
First Permit Cycle (01 July 2013 – October 31, 2018)	<ul style="list-style-type: none"> <li>Reviewed the final TMDL report to inform actions taken by the base to address sources of bacteria and update this Action Plan.</li> </ul>
	<ul style="list-style-type: none"> <li>Developed the Bacteria TMDL Action Plan and implementation schedule (JBLE–Eustis. 2016c).</li> </ul>
	<ul style="list-style-type: none"> <li>Identified and maintained a list of existing source controls and management practices that are applicable to reducing fecal coliform bacteria.</li> </ul>
	<ul style="list-style-type: none"> <li>Identified opportunities for enhancing education and outreach programs to address bacteria impairment.</li> </ul>
	<ul style="list-style-type: none"> <li>Assessed significant sources of bacteria using desktop evaluations, field investigations and collaboration with key base staff.</li> </ul>
	<ul style="list-style-type: none"> <li>Determined if additional source controls are needed. Prepared a summary of potential controls and identified programs and activities to support their implementation.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluated new bacteria-related datasets for the watersheds collected by other agencies (e.g., VDEQ) as available.</li> </ul>
Anticipated Second Permit Cycle (01 November 2018 – 31 October 2023)	<ul style="list-style-type: none"> <li>As funding permits, implement activities identified in the implementation schedule (from previous years) as appropriate.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluate new bacteria-related datasets for the watersheds collected by other agencies (e.g., VDEQ) as available.</li> </ul>
	<ul style="list-style-type: none"> <li>Identify any modified or additional activities to be performed during the subsequent permit cycle.</li> </ul>
	<ul style="list-style-type: none"> <li>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.</li> </ul>



## **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

- JBLE–Eustis. 2016a. *Final Illicit Discharge Detection and Elimination Procedure Manual for Joint Base Langley Eustis – Eustis*. Prepared by AECOM Technical Services, Inc. August 2016.
- JBLE–Eustis. 2016b. *Final Standards and Specifications Erosion and Sedimentation Control for Joint Base Langley Eustis – Eustis*. Prepared by AECOM Technical Services, Inc. May 2016.
- JBLE–Eustis. 2016c. *Final Chesapeake Bay Total Maximum Daily Load Action Plan for Joint Base Langley Eustis – Eustis*. Prepared by AECOM Technical Services, Inc. April 2016.
- JBLE–Eustis. 2018. *Joint Base Langley Eustis – Eustis (JBLE–Eustis) Municipal Separate Storm Sewer System (MS4) Program Plan Annual Report, Year 5*.
- JBLE–Eustis. 2021a. *Final MS4 Program Plan for Joint Base Langley Eustis – Eustis*. Prepared by AECOM Technical Services, Inc. January 2020.
- JBLE–Eustis. 2021b. JBLE–Eustis Environmental website accessed 06 June 2021 from <https://www.jble.af.mil/Units/Army/Eustis-Environmental>.
- VDEQ. 2007. *Fecal Bacteria Total Maximum Daily Load Development for Warwick River*. Final Submission December 13, 2007.

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