



**Compensatory Mitigation Plan**

**PHASE II - I-95 ETL NORTHBOUND EXTENSION**

Harford County, Maryland | JMT Project Number 17-10674-001

**Submitted to:**  
U.S. Army Corps of Engineers, Baltimore District  
Maryland Department of the Environment

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The Maryland Transportation Authority (MDTA) owns, operates, and maintains a 50-mile portion of Interstate 95 (I-95) in Maryland, beginning north of Baltimore City and extending to the Delaware state line. To address safety and congestion concerns, the MDTA proposes to construct the second phase of the Express Toll Lanes (ETL) Northbound Extension Project in Harford County. This phase consists of roadway improvements along I-95 from north of Old Joppa Road to Bynum Run, as well as installation of fiber optic lines and traffic cameras as part of the Intelligent Transportation System (ITS) along I-95 from north of Old Joppa Road to MD 543 and along MD 24 and MD 152 (**Appendix A, Figure 1**).

The MDTA prepared a Master Plan for I-95 to comprehensively identify long-range transportation needs. Phase II of the I-95 ETL Northbound Extension Project occurs within the footprint of planned improvements for the Master Plan's Section 200, which extends from New Forge Road to north of MD 22. An Environmental Assessment (EA) was prepared for Section 200 by the MDTA in 2007, with the ETL Alternative identified as the Preferred Alternative in 2008. A Finding of No Significant Impact (FONSI) was issued by the Federal Highway Administration in 2010. A subset of interim improvements (Phase II of the I-95 ETL Northbound Extension Project) is being advanced along northbound I-95 from north of Old Joppa Road to Bynum Run; it is anticipated that the full Section 200 build out will be completed in the future.

Phase II of the I-95 ETL Northbound Extension Project has been divided into multiple construction contracts to be constructed between 2020 and 2026 (**Appendix A, Figure 2**). These construction contracts will consist of the following:

- MD 152 Interchange / I-95 NB ETL Two-Lane Extension / MD 152 Noise Wall;
- Clayton Road Overpass Reconstruction;
- MD 24 Interchange / Two-Lane ETL Extension / Winters Run Bridge;
- Abingdon Road Overpass;
- MD 152 Park and Ride Facility Relocation;
- MD 24/MD 924 Park & Ride;
- I-95 NB ETL Extension to Bynum Run / Noise Wall on NB I-95 North of Abingdon Road;
- Noise Wall on SB I-95 South of Calvary Road;
- Noise Wall on SB I-95 at MD 24 / Woodsdale;
- Old Mountain Road Advance Utility Bore;
- DMS Relocation from Abingdon Road to Bynum Run;
- ITS and sign installation; and
- Environmental mitigation.

The MDTA is the applicant for the U.S. Army Corps of Engineers (USACE) and Maryland Department of the Environment (MDE) permits and will be the responsible party for providing compensatory mitigation for unavoidable impacts to wetlands and streams associated with the proposed project.

## 1.2 PURPOSE AND NEED FOR I-95 ETL PHASE II IMPROVEMENTS

The purpose of the proposed project is to address capacity and safety needs within this section of roadway and thereby improve access, mobility, and safety for local, regional, and inter-regional traffic, including passenger, freight, and transit vehicles.

Currently, the southbound lanes in this section operate at a traffic Level of Service D to E (near failing) during morning peak hours, and northbound lanes operate at a Level of Service E during peak evening hours. It is anticipated that hours of congestion within this segment of road will increase from the current total of less than 10 hours for the entire week to over 30 hours by 2030. By then, this section of I-95 is projected to operate at a Level of Service F (failing) during weekend peak hours. In addition, the Section 200 crash rate is approximately 12 percent higher than similar state-maintained highways, demonstrating a need for safety improvements.

## 2.0 NATURAL RESOURCES IMPACTED

The proposed project would result in unavoidable impacts to state and federally regulated aquatic resources, including wetlands and streams. Impacted wetlands and streams are located within the Little Gunpowder Falls, Lower Winters Run, Haha Branch, and Bynum Run watersheds. Wetlands delineated consist of palustrine emergent (PEM) wetlands, palustrine scrub-shrub (PSS) wetlands, palustrine forested (PFO) wetlands, and wetlands with few trees located beneath the surrounding forest canopy (PFO/PEM). The resources are mostly low to moderate quality; many are fed primarily by roadside runoff and can be considered to have been impacted to some extent by the adjacent presence of I-95. The impacted resources and their functions and values are summarized in **Appendix B**.

Conservative impacts to aquatic resources were calculated in April 2019, based on the preliminary engineering limits of disturbance and further refined in July and October 2019 to account for avoidance and minimization efforts as well as impacts associated with compensatory mitigation projects. To provide a conservative estimate, all impacts were assumed to be permanent, with the exception of a few areas where temporary maintenance of streamflow impacts are anticipated. It is anticipated that projected impacts will decrease as design continues to be refined. Impacts requiring mitigation are summarized in **Tables 1 and 2** in **Section 3.1**; impacts to existing culverts, ephemeral streams, streams to be relocated on-site and in-kind, and impacts from mitigation activities were not included in these totals, as they are anticipated to not require mitigation.

## 3.0 ELEMENTS OF THE COMPENSATORY MITIGATION PLAN

The following sections describe the 12 mitigation plan components required under the Compensatory Mitigation for Losses of Aquatic Resources Rule (2008 Rule)<sup>1</sup>.

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<sup>1</sup> Department of Defense and Environmental Protection Agency. April 10, 2008. *Compensatory Mitigation for Losses of Aquatic Resources*. Final Rule. Federal Register. Vol. 73, No. 70: pp. 19594-19705. Retrieved from [https://www.epa.gov/sites/production/files/2015-03/documents/2008\\_04\\_10\\_wetlands\\_wetlands\\_mitigation\\_final\\_rule\\_4\\_10\\_08.pdf](https://www.epa.gov/sites/production/files/2015-03/documents/2008_04_10_wetlands_wetlands_mitigation_final_rule_4_10_08.pdf)

### 3.1 REQUIRED MITIGATION AND PROPOSED MITIGATION PACKAGE

USACE and MDE confirmed that the following mitigation credit ratios would apply for permanent impacts:

- Stream (intermittent and perennial) – 1 LF credit required per 1 LF stream impacted (1:1)
- PEM wetland – 1 SF credit required per 1 SF wetland impacted (1:1)
- PSS wetland – 2 SF credit required per 1 SF wetland impacted (2:1)
- PFO wetland – 2 SF credit required per 1 SF wetland impacted (2:1)
- PFO/PEM wetland – 2 SF credit required per 1 SF wetland impacted (2:1)

Mitigation totals are summarized in **Tables 1** and **2** below.

**Table 1: Wetland Mitigation Required**

Wetland Impacts Requiring Mitigation			Mitigation Ratio	Required Mitigation	
Cover Type	(SF)	(AC)		(SF)	(AC)
<b>USACE</b>					
PEM	30,818	0.71	1:1	30,818	0.71
PSS	7,563	0.17	2:1	15,126	0.35
PFO	128,334	2.95	2:1	256,668	5.89
PFO/PEM	2,298	0.05	2:1	4,596	0.11
<b>USACE TOTAL</b>	<b>169,013</b>	<b>3.88</b>	<b>N/A</b>	<b>307,208</b>	<b>7.05</b>
<b>MDE</b>					
PEM	31,038	0.71	1:1	31,038	0.71
PSS	7,563	0.17	2:1	15,126	0.35
PFO	133,779	3.07	2:1	267,558	6.14
PFO/PEM	2,298	0.05	2:1	4,596	0.11
<b>MDE TOTAL</b>	<b>174,678</b>	<b>4.01</b>	<b>N/A</b>	<b>318,318</b>	<b>7.31</b>

**Table 2: Stream Mitigation Required**

Stream Impacts Requiring Mitigation			Mitigation Ratio	Required Mitigation	
Flow	(LF)	(SF)		(LF)	(SF)
<b>USACE</b>					
Perennial	6,058	92,193	1:1	6,058	92,193
Intermittent	7,155	44,342	1:1	7,155	44,342
Ephemeral	0	0	1:1	0	0
<b>USACE TOTAL</b>	<b>13,213</b>	<b>136,535</b>	<b>N/A</b>	<b>13,213</b>	<b>136,535</b>
<b>MDE</b>					
Perennial	6,058	92,193	1:1	6,058	92,193
Intermittent	7,155	44,342	1:1	7,155	44,342
<b>MDE TOTAL</b>	<b>13,213</b>	<b>136,535</b>	<b>N/A</b>	<b>13,213</b>	<b>136,535</b>

The MDTA proposes to fulfill mitigation requirements through a package consisting of several sites. These sites are summarized within **Table 3** and shown on **Appendix A, Figure 3**. It should be noted that the proposed mitigation credit totals are draft, pending USACE and MDE comments and approval. Any mitigation provided above and beyond what is required for this project will be reserved for the ultimate Section 200 build out.

**Table 3: Proposed Mitigation Package**

Mitigation Site	Stream Mitigation Credits	Wetland Mitigation Credits	
	LF	SF	AC
Lilly Run Phase 1*	700	0	0
Lilly Run Phases 2-4	2,067	82,764	1.90
Carsins Run*	960	3,992	0.09
Jones Falls (Eccleston Site)	9,738	632,056	14.51
<b>Totals</b>	<b>13,465</b>	<b>718,812</b>	<b>16.50</b>

\*Reallocated from I-95 ETL Phase I Compensatory Mitigation Plan

Two of the proposed sites, Lilly Run Phase 1 and Carsins Run, will be reallocated from the Phase I Compensatory Mitigation Plan. When developing the mitigation plan for Phase I, MDTA proposed a combination of stream mitigation sites that would result in more mitigation credits than was anticipated to be necessary, with any excess to be applied to the Section 200 ultimate buildout. Since this time, mitigation needs for Phase I have decreased, due to the implementation of avoidance and minimization measures as well as the deferral of some impacts to the Phase II KH-3019 MD 152 Interchange contract; these reductions in impacts and mitigation needs have been tracked through the Phase I Quarterly Update system. As a result, mitigation from Lilly Run Phase 1 and Carsins Run is no longer needed to meet the total required mitigation for Phase I. Instead, MDTA proposes that mitigation credit generated at these sites be applied to Phase II. Given the deferral of some of the Phase I impacts to the Phase II contract KH-3019, reallocation of mitigation credits initially intended for Phase I is appropriate.

Impacts associated with the Lilly Run Phase 1 and Carsins Run construction are not included in the I-95 ETL Phase II JPA, as they have already been approved under other permits.

### 3.2 OBJECTIVES, PROJECT DESCRIPTIONS, AND DETERMINATION OF CREDITS

#### Lilly Run

The MDTA proposes to fund construction of Phase 1 and to design and construct Phases 2 through 4 of the City of Havre de Grace’s proposed Lilly Run stream restoration in Havre de Grace, Maryland, within the Lower Susquehanna River watershed (**Appendix A, Figure 4**). The City has identified four reaches within this stream corridor for restoration to be completed in Phases 1-4 below:

1. Phase 1 – along a tributary to Lilly Run from Revolution Street to approximately 1,400 LF downstream.
2. Phase 2 – from Revolution Street to Fountain Street, a narrow stream valley through an industrial site.
3. Phase 3 – from Fountain Street through a pipe beneath school property/soccer field to pipe outfall.
4. Phase 4 – through school property to Amtrak right-of-way / railroad crossing.

### Lilly Run Phase 1

Phase 1 was designed on behalf of the City of Havre de Grace to primarily address stormwater management and Total Maximum Daily Load concerns; therefore, its potential uplift of functions and values is limited. In addition, baseflow within the channel may become subterranean due to the proposed installation of deep, porous, furnished channel bed to promote infiltration. Therefore, MDTA proposes that mitigation credit for this stream restoration be granted at a ratio of 2 LF of stream restored per 1 LF of stream mitigation credit. The City of Havre de Grace proposes to restore 1,400 LF of stream, which would provide 700 LF of credit.

The tributary to Lilly Run is a straightened headwater system located near Havre de Grace Middle School. The stream is fed by 46 acres of unmanaged stormwater runoff; ponding also routinely occurs in adjacent areas. The upper extents of the ditch are currently filled with invasive *Phragmites* while the lower extents are choked with brush and debris.

The objectives of the compensatory mitigation include storing and conveying stormwater, improving habitat, providing slope and outfall stabilization, and treating water quality by reducing nutrient and sediment loads. The city proposes to convert the existing ditch into a wetland seepage system, consisting of a series of wetland pools of varying shape and volume that will border the stream channel. The channel itself will be stabilized with rock weirs and an 18-inch thick layer of streambed material consisting of river rock/gravel, silica cobble, and washed sand. Lining the banks with bioretention soil mix and the stream channel with streambed material is proposed to promote infiltration, while the creation of pools and installation of wetland plants are proposed to remove suspended particles and nutrients. A riparian buffer of wetland plants will be established along the stream. The design plans and report for Lilly Run Phase 1 are included in **Appendix C**.

### Lilly Run Phases 2-4

Restoration along approximately 2,067 LF of Lilly Run is proposed at a mitigation credit ratio of 1:1. Approximately 1.90 acres of wetland creation credit is also proposed.

Lilly Run has been straightened/channelized and piped, which has resulted in lateral and vertical instabilities, transport of sediment and nutrients to downstream receiving waters, exacerbation of flooding, and loss of available aquatic and terrestrial habitat. Existing development has significantly encroached into the stream corridor, which has reduced available floodplain and stream buffer. Current land management practices include mowing of the stream buffer, which does not provide adequate shading and cover for aquatic species and does not provide for filtering of offsite pollutants.

The mitigation approach for Lilly Run is to create a stable stream and floodplain/wetland complex that will accommodate the water and sediment supplied by the watershed while also incorporating habitat features to provide ecological uplift. A portion of the project site will include daylighting the existing pipe flow, using natural channel design techniques. The concept design report, plans, Phase II checklist, and mitigation credit map for Lilly Run Phases 2-4 are included in **Appendix C**.

### Carsins Run

The MDTA proposes to perform stream restoration in Aberdeen, Maryland, within the Swan Creek watershed, along Carsins Run and its tributary at a mitigation credit ratio of 1:1 (**Appendix A, Figure 5**). Carsins Run is a stream located within MDTA right-of-way just north of the I-95/MD 22 interchange and west of I-95, within Section 200 but outside of the I-95 ETL Phase II project area. At the time that I-95 was originally built, Carsins Run was channelized and given a concrete substrate. Since that time, the bottom of the concrete channel has been washed out, and portions of the concrete bank have failed. In addition, an intermittent unnamed tributary to Carsins Run, referred to as Ripken Tributary, is actively eroding both vertically and laterally, likely due to altered hydrology resulting from the nearby Ripken Stadium development.

MDTA proposes to restore approximately 160 LF along Carsins Run and 840 LF along Ripken Tributary; however, MDTA is not seeking mitigation credit for the 40 LF of proposed stream restoration on City of Aberdeen property. As a result, 960 LF of stream mitigation credit will be generated. Up to 7,011 SF of incidental wetland creation is also proposed; 3,019 SF of this creation will be used to offset wetland loss caused by stream restoration. After subtracting that amount, approximately 3,992 SF of wetland creation credit is anticipated to remain.

The objectives of the compensatory mitigation include stream stabilization, sediment and nutrient reduction, floodplain reconnection, and aquatic habitat improvement. The proposed stream restoration activities within Carsins Run include removing the existing concrete substrate, adding weir structures and riffle grade controls, planting live stakes along the banks, and replacing a failed storm drain. Within the Ripken Tributary, MDTA proposes to realign the stream, reconnect it to its floodplain, create riffles and deep pools, and enhance riparian vegetation. The design plans and report for Carsins Run are included in **Appendix D**.

### Jones Falls (Eccleston Mitigation Site)

The MDTA will perform permittee-responsible stream and wetland mitigation along Jones Falls at the Eccleston Mitigation Site in Owings Mills, Maryland, within the Jones Falls watershed (**Appendix A, Figure 6**). Stream and wetland mitigation, including creation, restoration, enhancement, and preservation, is proposed along the Jones Falls and its tributaries for a total of 9,738 LF of stream mitigation credit and 14.5 acres of wetland mitigation credit. For a detailed credit breakdown, see **Tables 4 and 5** below and **Appendix E**, including mitigation credit maps, detailed stream mitigation credit table, and stream restoration justification memo.





**Table 4: Proposed Eccleston Stream Mitigation Credits**

Linear Feet	Proposed Mitigation Activity	Ratio	Proposed Credit
1,457	Perennial Stream Preservation	10:1	146
1,117	Intermittent and Perennial Stream Creation	5:1	223
6,980	Perennial Stream Restoration	1:1	6,980
9,555	Intermittent and Perennial Stream Buffer Enhancement and Preservation	4:1	2,389
<b>CREDIT SUM</b>			<b>9,738 LF</b>

**Table 5: Proposed Eccleston Wetland Mitigation Credits**

Acres	Proposed Mitigation Activity	Ratio	Proposed Credit
13.05	Wetland Restoration	1:1	13.05
3.32	Wetland Enhancement	1:3	1.11
5.71	Wetland Preservation	1:10	0.57
-0.22	Wetland Removal	1:1	-0.22
<b>CREDIT SUM</b>			<b>14.51 AC</b>

The Jones Falls and its tributaries have been straightened/channelized, impounded by damming, and diverted through piping. The stream buffer has been largely deforested and wetlands have been drained for agricultural production. This has led to water quality and habitat impairments as a result of sediment and nutrient pollution, diversion of baseflow, loss of canopy and stream cover, and disconnection from historic base-level floodplain, wetlands, and groundwater.

The proposed design is a modified Rosgen/floodplain restoration approach. The methodology utilizes both present day and historical references, as well as historic site soils, to meet top-level physiochemical and biological goals for the project. A proposed streambed profile will be located within the native valley basal gravels identified throughout the valley bottom, and furnished substrates of geologically appropriate composition and size, in the event of a lack of native material or where needed for transitional reaches. A hydrologic and hydraulic regime will be created, where the stream floods frequently in a non-erosive manner in order to maintain geomorphic and biological functions. A low-energy floodplain/wetland environment will be developed. A variety of woody debris structures will be placed for minor grade control (vertical stability) and specific habitats, with a fully sustainable surface treatment of native herbaceous and woody plant species through the full range of the ultimate conditions hydrograph. In addition, extensive reforestation and wetland restoration will result in establishment of vegetated stream buffers an average of 150 feet wide. Plans, Phase II checklist, and design report are included in **Appendix E**.

### 3.3 SITE SELECTION

In addition to the mitigation sites identified above, additional sites were screened for inclusion as potential compensatory mitigation sites or on-site, in-kind relocations. These efforts are further described below.



### Section 200 2012 Mitigation Plan

A mitigation plan was previously created in 2012 for the Section 200 ultimate build-out. A mitigation site search was conducted using GIS, aerial imagery, and field reviews. The MDTA also coordinated with multiple agencies to identify existing opportunities, perform field reconnaissance, and assess the sites; those agencies included USACE, MDE, DNR, the National Marine Fisheries Service, the USFWS, the Environmental Protection Agency (EPA), the US Department of Agriculture, and the Harford County Department of Planning and Public Works.

Of the sites identified in the 2012 mitigation plan, potential on-site mitigation was prioritized. On-site mitigation included perennial and intermittent concrete-lined systems within Section 200 that were identified for replacement with naturalized channels. Of these previously identified concrete-lined systems, only WUS 25B is located within the current project extents and would be feasible for naturalization. However, this stream was reviewed with MDE and USACE during the Phase II pre-application meeting. At that time, MDE and USACE determined that WUS 25B was not a high priority for mitigation, since the stream appears to not provide habitat for fish, is stable in its current condition, and does not have much potential for increased sinuosity.

The previous mitigation plan also included proposed stream mitigation at Carsins Run, WUS 14E, Grays Run, and Winters Run, all of which were considered on-site mitigation due to their location within Section 200. Carsins Run is included in this mitigation package. WUS 14E and Grays Run are located outside of the Phase II project area, but within the Section 200 ultimate build-out; therefore, mitigation at these locations will be pursued in future phases to ensure that stream restoration design and roadway design do not conflict. Concrete removal along the stream banks at Winters Run was considered as part of the current mitigation package but was ultimately determined to be not feasible or practicable, considering the potential for compromising the existing embankments beneath the bridge.

Any mitigation effort requiring acquisition of right-of-way would not be able to meet the accelerated Phase II project schedule. Due to these time constraints, off-site mitigation opportunities identified within the previous mitigation plan are not being pursued.

### Current Site Search

Additional on-site mitigation was identified in the form of roadside streams that can be replaced in-kind at the new toe-of-slope where possible. Where stream relocation potential has been identified, these impacts have not been counted towards mitigation requirement totals, since it is anticipated that the impacts will be mitigated on-site, in-kind through the relocation. Several such opportunities have been identified, and additional opportunities for relocation will be sought as design of the various contracts progresses.

WUS F-1 was identified as a potential onsite mitigation opportunity; it is a degraded stream located on the Izaak Walton League property, which will be purchased to allow construction of the MD 24/MD 924 Park and Ride facility. Debris that was deposited, apparently predating the Clean Water Act, can be observed within the stream, including shingles and concrete, and portions of the stream embankment are unstable. However, site constraints, including a sewer line, narrow stream valley, and close proximity to adjacent properties, limit

the quality of mitigation that could be accomplished at this location. In addition, it is unknown what hazards the previously deposited materials may pose to workers. Therefore, the MDTA has decided not to pursue mitigation at this location.

Whitemarsh Run is another MDTA-owned site and was discussed as a source of wetland mitigation credit. Excess wetland credits were created there as part of Section 100 mitigation. However, following the completion of Section 100 and the allocation of credits for Phase I of the I-95 ETL Northbound Extension Project, it was determined that insufficient additional wetland credits remain at this site to include it in the mitigation package for Phase II of the I-95 ETL Northbound Extension Project.

The MDTA reached out to Harford County, DNR, and USACE for potential mitigation sites. The sites provided by Harford County were either located on private property or too small in size to be feasible compensatory mitigation projects. DNR identified the Piney Run mitigation site in Carroll County, which was considered as part of the current mitigation package. However, due to extensive encumbrance by an existing sewer line and the presence of historically dumped coal ash, USACE determined that the Piney Run site would not provide viable mitigation.

USACE identified the Lilly Run stream restoration sites during the mitigation site search for Phase I of I-95 ETL Northbound Extension Project. All four phases of Lilly Run are high priority for the City of Havre de Grace, due to ongoing flooding concerns; therefore, all phases of Lilly Run are proposed to be completed to fulfill a portion of the compensatory mitigation required for Phase II of the I-95 Northbound Extension Project.

Finally, the Eccleston mitigation site in Baltimore County was identified as a large, high-quality site that would provide extensive wetland and stream mitigation credit. Design at this site is at an advanced stage and can be constructed quickly. For these reasons, the MDTA decided to pursue the Eccleston Site for mitigation credit.

### **3.4 SITE PROTECTION INSTRUMENT**

The Lilly Run mitigation site (all phases) will be protected through a Memorandum of Agreement with the City of Havre de Grace; the site protection mechanism will be included as a condition of the agreement. The Eccleston Site will be protected by a conservation easement held by a third party, the North American Land Trust, which will follow the USACE conservation easement template.

The Carsins Run mitigation site is located primarily on land owned by MDTA; the MDTA portion of the site will be protected under a declaration of restrictive covenants. Where portions of the mitigation site are located on private property, conservation easements following the USACE conservation easement template will be secured. In addition, access is required through City of Aberdeen and Ripken Baseball Academy, LLC, property for construction, monitoring, and maintenance, and will be secured through a Right of Entry Agreement.

The draft easements, declaration of covenants, and Memorandum of Agreement will be provided no later than 90 days prior to the start of construction.

### 3.5 BASELINE INFORMATION

Baseline information has been collected for Lilly Run, Carsins Run, and Eccleston; see **Appendices C, D and E**, respectively.

### 3.6 MITIGATION WORK PLAN

Detailed mitigation work plans for Lilly Run, Carsins Run, and Eccleston can be found in **Appendices C, D and E**, respectively.

Detailed written specifications will be developed to support the construction drawings. Once agreement has been reached by USACE, MDE, and MDTA on the final design package, contracts to implement the restoration activities will be let.

### 3.7 MAINTENANCE PLAN

A detailed maintenance plan has been developed for Eccleston and can be found in **Appendix F**. A maintenance plan will be developed for Lilly Run as design progresses. See the Carsins Run design report in **Appendix D** for the Carsins Run maintenance plan.

The compensatory mitigation sites will be designed to be self-sustaining after the monitoring period is over and performance standards have been met. Until that time, the MDTA anticipates the need to control invasive species within created wetlands, control deer browse, and perform adaptive management as necessary for stream restoration structures/features. Invasive species will be monitored and treated as necessary within created wetlands, up to twice per year. Deer browse of riparian plantings will be monitored and managed through the use of exclusion fencing. Locations of specific stream restoration structures/features will be visited after major storm events to determine if the restoration structures/features are performing according to the design and performance standards. Bed, bank and upland erosion are anticipated to be the biggest maintenance concerns. Any anomalies in either vegetation or stream stability within restoration areas will be brought to the attention of both USACE and MDE to determine if remedial measures are warranted. In the event remedial measures are implemented at the mitigation site, the monitoring period may be extended. The extension of monitoring periods will be determined on a case-by-case basis.

### 3.8 MONITORING REQUIREMENTS AND PERFORMANCE STANDARDS

MDTA has proposed custom monitoring requirements and performance standards for Eccleston, to aid in demonstrating ecological uplift. For Lilly Run wetland creation, wetland monitoring requirements and performance standards will follow the April 2018 Performance Standards and Monitoring Protocol for Permittee-Responsible Nontidal Wetland Mitigation Sites document. Stream monitoring at Lilly Run is anticipated to follow the same protocol included in the USACE and MDE permits for Phase I of the I-95 ETL Northbound Extension Project. See **Appendix G** for the above-mentioned monitoring and performance standard documents. See the Carsins Run design report in **Appendix D** for the Carsins Run monitoring and performance standards.

If the goals specified within the performance standards for any mitigation site are not achieved, remedial measures will be implemented. A description of proposed remedial measures and a schedule for implementation of remedial measures will be prepared and submitted to the regulatory agencies for review and approval.

### **3.9 LONG-TERM MANAGEMENT PLAN**

Once the monitoring period has ended and the sites have been deemed successful, Lilly Run will be maintained by the City of Havre de Grace, Carsins Run will be maintained by MDTA, and Eccleston will be maintained by the North American Land Trust. A draft, detailed long-term management plan for Eccleston has been created and can be found in **Appendix E**.

MDTA is currently negotiating a Memorandum of Agreement with the City of Havre de Grace for the Lilly Run site. A detailed long-term management plan will be included as a condition of the agreement.

### **3.10 ADAPTIVE MANAGEMENT**

Should unforeseen issues threaten the success of a mitigation site, the designated maintaining party will implement adaptive management strategies. Potential issues could include erosion from extreme storm events during the vegetative establishment period and/or colonization of sites by invasive species triggering the need for adaptive management either during or after the required monitoring period. Monitoring reports comparing site-specific data with performance standards, in conjunction with observations made during data collection, will indicate the need to consider implementation of adaptive management. The maintaining party will follow the following steps if monitoring data or observations indicate adaptive management is necessary:

- Notify USACE and MDE of the issues, potential causes and proposed solutions;
- Work with USACE and MDE to agree upon corrective measures and establish a timeframe for implementation;
- Implement corrective measures according to the established schedule; and
- Continue to implement corrective measures and monitoring until performance standards have been met.

Adaptive management before project acceptance by the agencies will be the responsibility of MDTA for Lilly Run, Carsins Run, and Eccleston. Following project acceptance, should need for adaptive management arise, it will be the responsibility of the City of Havre de Grace for Lilly Run, MDTA for Carsins Run, and the North American Land Trust for the Eccleston Site.

### **3.11 FINANCIAL ASSURANCES**

The MDTA, as a state agency, operates on a 5-year Transportation Improvement Program (TIP) cycle and has allocated \$1.1 billion as a specific line item in its TIP budget to construct Phases I and II of the I-95 ETL Northbound Extension Project (see **Appendix H**). The funding allocated for the project is inclusive of any compensatory mitigation, including required construction, monitoring, and long-term maintenance activities, for unavoidable impacts associated with the proposed improvements.