

Stream Restoration Forum: The Practice, the Protocols, and Their Verification

Key Permitting Issues



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The “Mitigation Mentality”

Section 404 of the Clean Water Act

“In evaluating standard Section 404 permit applications, as a practical matter, information on all facets of a project, including potential mitigation, is typically gathered and reviewed at the same time. The Corps, except as indicated below, first makes a determination that potential impact have been avoided to the maximum extent practicable; remaining unavoidable impacts will then be mitigated to the extent appropriate and practicable by requiring steps to minimize impacts, and, finally, compensate for aquatic resource values.”

Section 404 MOU Between the Corps and EPA

“The Clean Water Act and the Guidelines set forth a goal of **restoring** and maintaining existing aquatic resources. The Corps will strive to avoid adverse impacts and offset unavoidable adverse impacts to existing aquatic resources, and for wetlands, will strive to **achieve a goal of no overall net loss of values and functions**. In focusing the goal on no overall net loss to wetlands only, EPA and Army have explicitly recognized the special significance of the nation's wetlands resources.”

Improving the Process in Maryland

Prior to the new process:

- There was no distinction between development impacts (generally permanent) and restoration impacts (generally temporary).
- There was a requirement to explain why impacts couldn't be reduced.
- There was a requirement for an “alternative site analysis.”
- There was a requirement for a “mitigation plan.”



Maryland
Department of
the Environment

**MS4/Chesapeake Bay
TMDL/Trust Fund
Restoration Project**
Wetlands & Waterways Permit
Package Check List

Check One Government Agency Non-profit Partner
 Other

(Cover To Be Printed on Green-Colored Paper)

Enhancement/Restoration Project Permit Checklist

1. Application Submittal Date: _____

2. Project Purpose (please check all that apply)

MS4 Permit Work WIP Implementation Trust Fund Project

3. Restoration Activities (please check all that apply)

Stream Restoration Wetland Restoration Stormwater BMP
 Other _____

4. Waiver of Alternatives Analysis:

For voluntary restoration projects associated with achieving local Municipal Separate Storm Sewer System (MS4) targets or Chesapeake Bay Total Maximum Daily Load (TMDL) goals, the alternatives analysis is waived based on the submission of watershed implementation plan (WIP) materials documenting the project location as a priority for restoration.

This submission includes relevant materials from the following document verifying that the project is an MS4/Chesapeake Bay TMDL-related restoration project:

Watershed Implementation Plan Comprehensive Watershed Assessment
 Design Report Other _____

5. Demonstration of Functional Impairment of the site/aquatic resource(s):

The current conditions of streams, wetlands or other aquatic resources where restoration or enhancement projects are proposed must be assessed and meet degradation criteria for both the existing biological function-based parameter AND the existing geomorphology/hydraulic function-based parameter. Applicants must include documentation (e.g., photographs and data sheets from filed assessments) demonstrating that the following degradation criteria have been met:

Streams

A. Perennial Streams:

1. **Biological Function-Based Parameter:** A Benthic Index of Biotic Integrity (BIBI) score of fair or worse (i.e., BIBI score of 50% or less); AND

2. **Geomorphology/Hydraulic Function-Based Parameter:** Documentation of existing stream conditions for at least one of the following:

- a) **Lateral Stability:** Geomorphic evidence of active, widespread lateral erosion (e.g., Bank Erosion Hazard Index/Near Bank Stress score of Moderate/Moderate or higher or an annual bank erosion); OR
b) **Floodplain Connectivity (Vertical Stability):** Evidence of floodplain disconnection throughout the majority of the reach (e.g., bank height ratio, entrenchment ratio, stage/Q relationship, Hydrologic Engineering Center River Analysis System or other hydraulic model); OR

c) **Other:** Other appropriate, approved metric that demonstrates water quality impairment and stream stability degradation of the project reach.

B. Intermittent Streams

1. **Biological Function-Based Parameter:** A Modified EPA Rapid Bioassessment Protocol Habitat Assessment score of marginal to poor AND

2. **Geomorphology/Hydraulic Function-Based Parameter:** Documentation of existing stream conditions for at least one of the following:

- a) **Lateral Stability:** Geomorphic evidence of active, widespread lateral erosion (e.g., Bank Erosion Hazard Index/Near Bank Stress score of Moderate/Moderate or higher or an annual bank erosion rate of greater than 0.1 foot/year); OR
b) **Floodplain Connectivity (Vertical Stability):** Evidence of floodplain disconnection throughout the majority of the reach (e.g., bank height ratio, entrenchment ratio, stage/Q relationship, Hydrologic Engineering Center River Analysis System or other hydraulic model); OR

c) **Other:** Other appropriate, approved metric that demonstrates water quality impairment and stream stability degradation of the project reach.

Quarterly Meetings with MDE & Corps' Staff

Regular meetings, open to any applicants:

- Serve as a “pre” pre-application meeting to establish project benefits and get key questions answered.
- Provides an open forum for discussion on approaches, and to resolve potential regulatory concerns early on.
- Provide a venue for applicants and regulators to build rapport.



The poster features the logos for RK&K (Engineers | CONSULTING MANAGERS | PLANNERS | SCIENTISTS) and the Anne Arundel County WATERSHED Protection & Restoration PROGRAM, which includes a blue bird icon. Below the logos is a row of four photographs showing stream restoration work: a rocky stream bed, a grassy bank, a stream with a small waterfall, and a pond. The text on the poster reads: "MDE/USACE REGULATORY COORDINATION MEETING", "FURNACE CREEK STREAM RESTORATION", "OCTOBER 5, 2016", "JAMES WOODS – WPRP PROJECT MANAGER", and "DREW ALTLAND AND GREG O'HARE – RK&K". At the bottom left is the Anne Arundel County Maryland logo, and at the bottom right is the slogan "Healing Our Rivers".

Anne Arundel County
WATERSHED
Protection & Restoration
PROGRAM

MDE/USACE REGULATORY COORDINATION MEETING
FURNACE CREEK STREAM RESTORATION
OCTOBER 5, 2016

JAMES WOODS – WPRP PROJECT MANAGER
DREW ALTLAND AND GREG O'HARE – RK&K

ANNE ARUNDEL COUNTY MARYLAND

Healing Our Rivers

Project Overview

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- Comprehensive Assessment of Patapsco Tidal Watershed identified this reach for restoration
- Ecological enhancement of 3,700 LF of Furnace Creek floodplain to meet TMDL and improve habitat
- Starts at NJ Ave NE/Kent Rd & extends to MD-10
- Current Mainstem conditions:
 - ▣ Upper reach - concrete (2,600 LF)
 - ▣ Lower reach - incised natural channel (1,100 LF)
- Establishment of integrated stream/wetland floodplain
- Elevate stream profile over concrete, to existing downstream floodplain surface
- Academic input/peer review/2D modeling support by Dr. Parola

Preliminary Monitoring Results

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Biology / Habitat:

Reach	Observations	BIBI	Habitat
FB-01-16	Degraded, deeply incised, eroding banks, trash	1.86 “very poor”	RBP = 114 (partially-supporting) MBSS PHI=63.83 (degraded)
FB-02-16	Concrete trapezoidal channel with patchy vegetation	1.86 “very poor”	RBP = 71 (non-supporting); MBSS PHI = 44.87 (severely degraded)

Water Quality / Hydrology:

- Very “flashy” stormflow, likely due to high imperviousness in the watershed and a concrete channel in upper reach
- High E. Coli bacteria levels measured during base flow and storm flow samples

Waters & Wetlands Enhancements

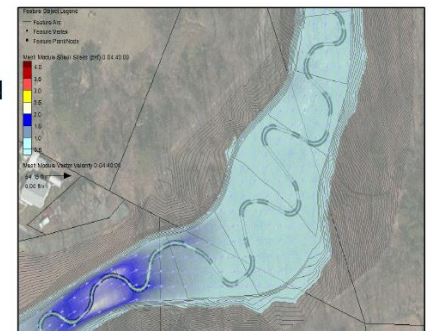
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Resource	Existing	Proposed
Waterway	*4,407 LF	TBD
Wetland	**0.69 AC	5.6 AC
Floodplain/ Riparian Buffer	5.9 AC	7.5 AC

* Includes intermittent channels in floodplain; excludes small concrete outfall channels
**0.26 Acres of PEM & 0.43 Acres of PFO

Responsible Design

- 2-D Modeling to ensure sustainable design
- Access through existing open areas
- Limited specimen tree impact
- Retention of higher quality upland forest
- Restoration of wetlands that are currently losing floodplain connection due to stream channel downcutting



Still Work to Be Done

- * Though MDE and the Corps seem to have bought into the distinction between development and restoration impacts, many local government agencies either lack the tools or will to permit resource impacts in a more nuanced fashion.
- * There are still significant regulatory disincentives to projects that optimize floodplain re-connection and wetland creation/enhancement.
- * Despite restoration success, there are still some in the regulatory community who think we can “avoid” our way to recovery.

