MARYLAND NONTIDAL WETLAND MITIGATION GUIDANCE

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PURPOSE

The purpose of this document is to assist landowners in fulfilling the mitigation requirements of the Nontidal Wetlands Protection Act. Mitigation is required when losses of nontidal wetlands are authorized in a Nontidal Wetlands and Waterways Permit or approved in a Soil Conservation and Water Quality Plan. This document explains the mitigation requirements, how to select mitigation sites, and how to develop and implement mitigation plans. It is hoped that this document will help to increase the proportion of successful mitigation projects, which are critical to State efforts to meet the goal of "no net loss" of nontidal wetland acreage and function. With that being said, proposed mitigation projects will still need to be reviewed on a case-by-case basis.

BACKGROUND

What are nontidal wetlands?

Nontidal wetlands are inland, freshwater areas not subject to tidal influence. They are typically areas where the water table is at or near the surface, or the land is covered by shallow water. Nontidal wetlands encompass a variety of diverse environments such as marshes and swamps, bottomland hardwood forests, wet meadows, inland bogs, and the shallow areas of lakes and ponds. Forested wetlands include swamps and wooded floodplains dominated by trees over 20 feet in height. Scrub-shrub wetlands include bogs, shrub swamps, and other wetlands dominated by trees and/or shrubs less than 20 feet in height. Emergent wetlands are marshy areas dominated by herbaceous (non-woody) plants.

The Nontidal Wetlands and Waterways Division has fact sheets available that explain how to recognize nontidal wetlands (see Appendix A). In addition, the "Field Guide to Nontidal Wetland Identification" presents the wetland concept, definition, hydric soils, and plants in a field guide format to assist the lay person in identifying and determining boundaries of nontidal wetlands. Nontidal wetlands are required by law to be identified by methods described in the 1987 "Corps of Engineers Wetland Delineation Manual" and Regional Supplements to the Corps Delineation Manual. Information on where to obtain these documents is in Appendix A.

Why are nontidal wetlands important?

Nontidal wetlands perform many important functions. These functions include:

- Providing habitat for plant and wildlife species, some of which are rare, threatened, or endangered;
- Furnishing organic (plant) material to the aquatic food web;
- Buffering lowland waters by filtering sediments, pollutants, and excess nutrients such as

nitrogen and phosphorus;
- Storing, slowing, and reducing the destructive power of floodwaters;
- Replenishing aquifers (groundwater, including drinking water supplies);
- Reducing erosion of streambanks and riverbank;
- Supplying harvestable natural resources such as timber, fish, and furbearing mammals; and
- Providing recreational opportunities, such as hiking, fishing, hunting, canoeing, and bird-watching.

What is Maryland doing to protect nontidal wetlands?

Maryland authority governing nontidal wetlands and waterways closely parallels the federal controls, but evolved from three separate acts of the Maryland General Assembly. In 1933, the assembly recognized that man-made changes to a stream or other body of water may result in flooding, adverse impacts to fish habitat and migration, and increased erosion. The Waterway Construction Statute was passed to regulate activities in streams and their 100-year floodplains. In 1970, tidal wetlands were given state protection. The 1987 Chesapeake Bay Agreement included a commitment to increase the protection of nontidal wetlands. To honor its commitment, Maryland created a special task force to develop a comprehensive wetland protection policy. Due to continued wetland losses and an existing inefficient regulatory framework, the task force recommended a new State law. In 1989, the Maryland General Assembly endorsed the task force recommendation by enacting the Nontidal Wetlands Protection Act.

The Nontidal Wetlands Protection Act seeks to protect these lands by regulating and restricting all activities that could impact nontidal wetlands or waters of the state. The Act also helps to insure “no net loss” in wetlands acreage and function, by requiring mitigation or compensation for any wetland losses. The Act also has provisions for the structuring of a smooth and expedient application review process, for dealing with developments in wetlands. The Act also directs the Department to assist local governments in undertaking nontidal wetland management planning, and provide technical assistance; conduct educational programs; purchase, restore and create nontidal wetlands and adopt standards for planning, regulating, restoring, and creating, and enhancing nontidal wetlands.
From its inception, Maryland's nontidal wetlands protection program was designed to parallel many aspects of Section 404 of the Clean Water Act (CWA). Regulated activities include:

- Removal, excavation, or dredging of soil or materials of any kind;
- Changing existing drainage or flood retention characteristics;
- Disturbance of the water level or water table by drainage, impoundment, or other means;
- Filling, dumping, discharging of material, driving piles, or placing obstructions;
- Grading or removal of material that would alter existing topography; and
- Destruction or removal of plant life.

Three aspects of Maryland law differ from federal regulation: authority over isolated wetlands, the alteration of vegetation and hydrology, and regulation of a 25-foot buffer. The regulation of these additional activities, plus clear jurisdiction over isolated wetlands, was intended to close loopholes that existed in the Section 404 program.

MDE also regulates the alteration of vegetation and hydrology in wetlands. This authority also differs from the Corps, in that the Corps may only regulate the placement of "fill" in nontidal wetlands.

MDE additionally regulates activities in a 25-foot buffer around nontidal wetlands, which the Corps does not. Buffer requirements are expanded to 100 feet for "nontidal wetlands of special State concern." Nontidal wetlands of special State concern are designated by regulation and mapped as having exceptional ecological or educational value of statewide significance.

The regulatory differences in Maryland's wetlands laws recognize that the benefits provided by a wetland depend on its hydrology and vegetation, and that activities immediately adjacent to a wetland may have as much effect on its function as activities in the nontidal wetland itself.

What is mitigation?

When authorizations are issued for activities which will cause unavoidable losses of nontidal wetlands, the losses must be countered with wetland gains to meet the "no net loss" goal. The primary means of accomplishing wetland gains is through wetland mitigation. Nontidal wetland mitigation is the creation, restoration, or enhancement of nontidal wetlands, to compensate for nontidal wetlands that were or will be lost due to regulated activities or non-exempt agricultural activities. The State definition of mitigation corresponds to the Federal definition of compensatory mitigation. Mitigation is not required for temporary impacts to wetlands or impacts to the wetland buffer or expanded buffer.

Nontidal wetland creation projects establish nontidal wetlands on upland sites. These projects usually involve lowering the elevations of uplands by grading the soil for the purpose of increasing the frequency of soil saturation, flooding, and ponding.

Nontidal wetland restoration projects reestablish nontidal wetlands on sites where they were formerly located. For example, the removal of drainage structures from agricultural fields can result in nontidal wetland restoration.

Nontidal wetland enhancement projects improve the functions of nontidal wetlands. Planting wetlands that are farmed or dominated by lawn grass is the most common type of enhancement project. Other enhancement projects may include restoring hydrology to partially drained wetlands and/or removing invasive species. Enhancement projects do not increase the acreage of nontidal wetlands.

Other types of activities may be considered as mitigation on a case-by-case basis. Preservation of exceptional resources may be considered especially when there is a threat to the resource (e.g. development risk). Out-of-kind mitigation may include stream restoration, especially to restore adjacent floodplains and groundwater levels.

MITIGATION REQUIREMENTS

When is mitigation not required?

The following activities are exempt from permit and mitigation requirements:

- **Forestry activities**
- Traditional ongoing **agricultural activities** such as plowing and cultivating, which do not drain, dredge, fill, or otherwise convert undisturbed nontidal wetlands to agricultural production.
- **Development activities** with minimal or temporary impacts to nontidal wetlands and which are exempt or qualify for a Letter of Authorization, except Letters of Authorization for activities in the Chesapeake Bay Critical Area.

What activities require mitigation?

Mitigation is required for the regulated and agricultural activities listed below:

- Removal, excavation, or dredging of soil, sand, gravel, minerals, organic matter, or materials of any kind;
- Changing existing drainage characteristics, sedimentation patterns, flow patterns, or flood retention characteristics;
- Disturbance of the water level or water table by drainage, impoundment, or other means;
- Dumping, discharging of material, or filling with material, including the driving of piles and placing of obstructions;
- Grading or removal of material that would alter existing topography;
- Destruction or removal of plant life that would alter the character of a nontidal wetland; and
- New agricultural activities in wetlands.

MITIGATION FOR DEVELOPMENT ACTIVITIES

What is the procedure for mitigating for the loss of nontidal wetlands due to development activities?

If mitigation will be required for a development activity, a Phase I (conceptual) Mitigation Plan must be developed.

The following steps should be taken:

- Determine the acreage of each type of wetland (forested, scrub-shrub, and/or emergent) to be impacted, based on a delineation consistent with the 1987 "Corps of Engineers Wetlands Delineation Manual" and Regional Supplements to the Corps Delineation Manual.
- Determine whether a mitigation project, payment into an approved Wetland Mitigation Bank, or a payment into the Nontidal Wetlands Compensation Fund (see Mitigation Options and Site Selection section) will be proposed.
- If a mitigation project is proposed, locate an appropriate mitigation site(s).
- Develop a Phase I Mitigation Plan to meet the mitigation goals. Do not proceed with a Phase II (design) Mitigation Plan until Phase I has been approved by the Department.
- Submit Phase I of the mitigation plan or a proposal to use an approved Wetland Mitigation Bank, or the Nontidal Wetlands Compensation Fund, to the Department as part of the application.
- For mitigation projects, demonstrate that you have the right to use the site for mitigation.
- The Department will render a decision on the acceptability of Phase I as part of a final permit decision.
- The Department may require modifications to the Phase I as part of the final permit decision.
- If payment into an approved Wetland Mitigation Bank is approved by the department, a copy of the signed contract showing the purchase of all required mitigation credits must be received prior to issuance of authorization.
- If payment into the MDE Nontidal Wetlands Compensation Fund is approved by the Department, payment must be received prior to issuance of authorization.
- If necessary, obtain a mitigation surety bond or other approved financial assurance prior to issuance of authorization. The mitigation surety bond will be returned after the Department determines that the mitigation project has been successfully completed and is developing into an acceptable wetland system.
- The applicant should submit the Phase II Mitigation Plan to MDE as part of the permit application, to the maximum extent practicable. The Corps may require that projects requiring an Individual Permit have an approved Phase II Mitigation

Plan prior to issuance of authorization. For projects requiring a General Permit, the Corps may require that the Phase II Mitigation Plan be approved prior to commencing impacts. The applicant should send all the information to MDE at the same time as the Corps, so we are able to comment on the Phase II plan in conjunction with the Corps' review.

If the project is not exempt from mitigation requirements, and the permittee is proposing to conduct permittee-responsible mitigation, the following mitigation steps are required as permit conditions:

- After the Phase I Mitigation Plan has been approved, develop a Phase II (design) Mitigation Plan. Guidance on the required contents of Phase II will be part of the final permit decision, unless the Phase II plan is required and must be approved prior to the final permit decision.
- Submit Phase II of the mitigation plan to the Department within 3 months of receiving a favorable permit decision, unless otherwise determined by the Department.
- The Department will render a decision within 45 days of receipt of a completed Phase II mitigation plan.
- If necessary, change the mitigation plan based on comments by the Department.
- Demonstrate that the site has been protected in perpetuity and that the Department has a right of entry to the site at any time.
- After the Phase II Mitigation Plan has been approved by the Department, create, restore, and/or enhance nontidal wetlands at the mitigation site(s). The mitigation project should be successfully constructed in advance or concurrently with the authorized impacts.
- Notify the Mitigation and Technical Assistance Section upon the start of grading and the completion of planting of the mitigation project.
- Submit an "as-built" site design plan to the Mitigation and Technical Assistance Section within 120 days of the completion (including grading, planting, and/or vegetative stabilization) of the mitigation project.
- Monitor the success of the mitigation project for 5 years (or other time periods as agreed to by the Department) (see Appendix H).
    - Submit annual monitoring reports.
    - Conduct maintenance activities.
    - Modify the mitigation design to insure success.
- The original permittee or authorized person, as stated in the authorization, must notify the Mitigation and Technical Assistance Section if the authorization is transferred to another party. If the mitigation obligation has not yet been completed to the Department's satisfaction (through payment into an approved mitigation bank, payment into the Compensation Fund, or termination of mitigation monitoring by the Department), and the permittee or authorized person listed on the authorization transfers responsibility for the mitigation obligation to

another party, the permittee or authorized person listed on the authorization must notify the Mitigation and Technical Assistance Section.

MITIGATION FOR AGRICULTURAL ACTIVITIES

What is the procedure for mitigating for the loss of nontidal wetlands due to agricultural activities?

For agricultural activities that are conducted in nontidal wetlands and that require a Soil Conservation and Water Quality Plan, a farmer must:

- Contact the Soil Conservation District (SCD) to identify or verify the extent of nontidal wetlands before beginning agricultural activities in nontidal wetlands.
- Submit a Soil Conservation and Water Quality Plan with best management practices (see below) to the SCD for approval.
- Submit the mitigation components of the Soil Conservation and Water Quality Plan to the Department. Within 60 days of receipt, the Department will determine whether or not the mitigation component is consistent with the regulations.
- For mitigation projects, demonstrate that you have the right to use the site for mitigation.
- Submit the State-approved mitigation component of the Soil Conservation and Water Quality Plan to the SCD.
- Receive SCD approval of a Soil Conservation and Water Quality Plan that is consistent with the mitigation requirements.
- If payment into an approved Wetland Mitigation Bank is approved by the department, a copy of the signed contract showing the purchase of all required mitigation credits must be received prior to issuance of authorization.
- If payment into the MDE Nontidal Wetlands Compensation Fund is approved by the department, payment must be received prior to issuance of authorization.
- If necessary, obtain a mitigation surety bond or other approved financial assurance prior to issuance of authorization. The mitigation surety bond will be returned after the Department determines that the mitigation project has been successfully completed and is developing into an acceptable wetland system.
- The applicant should submit the Phase II Mitigation Plan to MDE as part of the permit application, to the maximum extent practicable. The Corps may require that projects requiring an Individual Permit have an approved Phase II Mitigation Plan prior to issuance of authorization. For projects requiring a General Permit, the Corps may require that the Phase II Mitigation Plan be approved prior to commencing impacts. The applicant should send all the information to MDE at

the same time as the Corps, so we are able to comment on the Phase II plan in conjunction with the Corps' review.

- Create, restore, and/or enhance nontidal wetlands at the mitigation site(s). The mitigation project should be successfully constructed in advance or concurrently with the authorized impacts. Notify the Mitigation and Technical Assistance Section upon the start of grading and the completion of planting of the mitigation project. Submit an "as-built" site design plan to the Mitigation and Technical Assistance Section within 120 days of the completion (including grading, planting, and/or vegetative stabilization) of the mitigation project.
- Demonstrate that the site has been protected in perpetuity, and that the Department has a right of entry to the site at any time.
- Monitor the success of the mitigation project for 5 years (or other time periods as agreed to with the Department) (see Appendix H).
    - Submit annual monitoring reports.
    - Conduct maintenance activities.
    - Modify the mitigation design to ensure success.
- If the permittee or authorized person, as stated in the authorization, changes, they must notify the Mitigation and Technical Assistance Section. If the mitigation obligation is to be transferred to another party, the permittee or authorized person must notify the Mitigation and Technical Assistance Section.

Best management practices (BMPs) are conservation measures that control soil loss, reduce water quality degradation, and/or minimize adverse impacts to water quality and flow, and the chemical, physical, and biological characteristics of nontidal wetlands. Examples of BMPs include filter strips, field borders, conservation cropping sequences, nutrient and pesticide management, and irrigation water management.

MITIGATION FOR SURFACE AND STRIP MINING ACTIVITIES

What is the procedure for mitigating for the loss of nontidal wetlands due to surface and strip mining activities?

If mitigation will be required for a mining activity, a Phase I (conceptual) Mitigation Plan must be developed.

The following steps should be taken:

- Determine the acreage of each type of wetland (forested, scrub-shrub, and/or emergent) to be impacted, based on a delineation consistent with the 1987 "Corps of Engineers Wetlands Delineation Manual" and Regional Supplements to the Corps Delineation Manual.
- Locate an appropriate mitigation site.

- Develop a wetlands mitigation component of the mining reclamation plan to meet the mitigation goals.
- Submit the wetlands mitigation component of the mining reclamation plan to the Department with the applications for a Permit to Surface Mine and/or a Nontidal Wetlands and Waterways Permit.
    - Within 45 days of receipt of a completed mitigation plan, the Department will render a decision on the mitigation component of the mining reclamation plan.
    - The Department may require modifications to the mitigation component of the mining reclamation plan as part of the final permit decision.
- For mitigation projects, demonstrate that you have the right to use the site for mitigation.
- If payment into an approved Wetland Mitigation Bank is approved by the department, a copy of the signed contract showing the purchase of all required mitigation credits must be received prior to issuance of authorization.
- If payment into the MDE Nontidal Wetlands Compensation Fund is approved by the department, payment must be received prior to issuance of authorization.
- If necessary, obtain a mitigation surety bond or other approved financial assurance prior to issuance of authorization. The mitigation surety bond will be returned after the after the Department determines that the mitigation project has been successfully completed and is developing into an acceptable wetland system. This bond will be in addition to the mining bond.
- The applicant should submit the Phase II Mitigation Plan to MDE as part of the permit application, to the maximum extent practicable. The Corps may require that projects requiring an Individual Permit have an approved Phase II Mitigation Plan prior to issuance of authorization. For projects requiring a General Permit, the Corps may require that the Phase II Mitigation Plan be approved prior to commencing impacts. The applicant should send all the information to MDE at the same time as the Corps, so we are able to comment on the Phase II plan in conjunction with the Corps' review.

If the project is not exempt from mitigation requirements, the following mitigation steps must be performed, and will be required as permit conditions:

- If necessary, change the mitigation component of the mining reclamation plan to meet comments by the Department.
- After mining is completed in the area to be used for the mitigation (if onsite), create, restore, and/or enhance nontidal wetlands at the mitigation site(s). Notify the Mitigation and Technical Assistance Section upon the start of grading and the completion of planting of the mitigation project. Submit an "as-built" site design plan to the Mitigation and Technical Assistance Section within 120 days of the completion (including grading, planting, and/or vegetative stabilization) of the mitigation project.
- Demonstrate that the site has been protected in perpetuity, and that the

Department has a right of entry to the site at any time.

- Monitor the success of the mitigation project for 5 years (or other time periods as agreed to by the Department) (see Appendix H).
    - Submit annual monitoring reports.
    - Conduct maintenance activities.
    - Modify the mitigation design to insure success.
- If the permittee or authorized person, as stated in the authorization, changes, they must notify the Mitigation and Technical Assistance Section. If the mitigation obligation is to be transferred to another party, the permittee or authorized person must notify the Mitigation and Technical Assistance Section.

ACREAGE REQUIREMENTS

How is the amount of required mitigation determined?

Acreage replacement ratios are used to determine the amount of mitigation required. Before any nontidal wetlands have been impacted by a project, the amount of each type of wetland to be lost (forested, scrub-shrub, and/or emergent) must be determined. Acreage replacement ratios are expressed as a relationship between two numbers. The first number specifies the acreage to be mitigated and the second number specifies the acreage of nontidal wetlands impacted. The acreage replacement ratios are:

WETLAND TYPE	REPLACEMENT RATIO[1]
Emergent	1:1
Emergent, using a bank	1.5:1
Farmed	1:1
Farmed, using a bank	1.5:1
Scrub-shrub to emergent conversion	1:1
Scrub-shrub to emergent conversion, using a bank	1.5:1
Scrub-shrub to emergent conversion (of special State concern)	2:1
Forested to emergent conversion	1:1
Forested to emergent conversion, using a bank	1.5:1
Forested to emergent conversion (of special State concern)	2:1
Forested to scrub-shrub conversion	1:1
Forested to scrub-shrub conversion, using a bank	1.5:1
Forested to scrub-shrub conversion (of special State concern)	2:1
Scrub-shrub	2:1
Scrub-shrub, using a bank	3:1
Forested	2:1
Forested, using a bank	3:1
Emergent (of special State concern)	2:1
Emergent (of special state concern), using a bank	3:1
Scrub-shrub (of special State concern)	3:1
Scrub-shrub (of special State concern), bank	4.5:1
Forested (of special State concern)	3:1
Forested, (of special State concern), using a bank	4.5:1

For example, the required mitigation acreage for a project which impacts two acres of forested

1. According to law, mitigation that is proposed through use of a bank requires that the acreage replacement ratio equal or exceed 1.5:1. Regulations also state that the acreage replacement ratio for mitigation is higher for mitigation proposed through use of a bank. However, current regulations allow for options other than strict ratios for meeting mitigation requirements (COMAR 26.23.04.C (2)-(4). The ratios specified in regulations may be modified as the regulations are changed, to eliminate the current disincentive of using an approved mitigation bank.

wetlands, one acre of scrub-shrub wetlands, and two acres of emergent wetlands would be:

WETLAND TYPE	IMPACT (ACRES)	MITIGATION REQUIRED (ACRES)
Emergent	2.00	2.00
Scrub-shrub	1.00	2.00
Forested	2.00	4.00
Total	5.00	8.00

Scrub-shrub and forested wetlands have higher replacement ratios than emergent wetlands, because it is more difficult and takes longer to successfully reproduce the functions of these types of wetlands.

Nontidal wetlands of special State concern have exceptional ecological value of statewide significance, such as habitat for endangered species. They have the highest replacement ratios because their values may be irreplaceable. Nontidal wetlands of special State concern are listed in the Nontidal Wetlands regulations and are mapped on Nontidal Wetlands Guidance maps and in a Geographic Information Systems (GIS) layer available from the Department of Natural Resources.

Conversions of wetland type generally require mitigation. These conversions do not result in a loss of wetland acreage but do result in a loss of functions. These types of impacts are usually the result of projects involving golf course fairways or overhead transmission lines.

MITIGATION PROJECT GOALS

What are the goals of mitigation projects?

The goal of mitigation is to compensate for lost nontidal wetland acreage and functions, which is necessary for the State of Maryland to attain the overall goal of "no net loss" of nontidal wetland acreage and functions. Individual project goals must meet permit conditions, which will be aimed at replacing the wetland acreage and functions impacted by the project.

Mitigation goals should be based on a broader landscape perspective. For example, if wetland impacts occur in a watershed that has a high need for water quality improvements, the wetland may be designed with the goal of providing nutrient and sediment reductions to the receiving waters. There are numerous watershed plans available to help in determining the watershed needs. The Department developed the documents entitled “Prioritizing Areas for Wetland Restoration, Mitigation, and Preservation in Maryland” and “Priority Areas for Wetland Restoration, Preservation, and Mitigation in Maryland’s Coastal Bays” that identify priority areas within each watershed. The Watershed Resource Registry is also useful in locating and selecting high value sites.

Acreage requirements for mitigation projects will be based on acreage replacement standards and options. The mitigation plan should also incorporate the goals of replacing or improving the functions of the impacted wetland and meet broader watershed goals. If feasible and desirable from the watershed plan perspective, the source of water (groundwater, surface water, or floodwater) and the type of plant community in the impacted wetland should be duplicated.

For example, consider a project that will impact a forested nontidal wetland dominated by red maple and sweet gum and fed primarily by groundwater. Ideally, mitigation for this impact would entail lowering upland to create a groundwater-fed wetland and planting red maple and sweet gum seedlings. Additional plant species could be added to the mitigation site to increase the diversity, and possibly the functions, of the site.

GENERAL MITIGATION SITE SELECTION CRITERIA

What general criteria should be used to select mitigation sites?

In selecting sites, mitigation goals based on the wetland impact and improvement of problems within the watershed should both be taken into consideration and combined if possible. For instance, successful wetland creation projects in floodplains can reduce flooding problems which exist in a watershed.

When evaluating whether a site would make an acceptable mitigation site, lands preferred for mitigation usually have one or more of the following physical characteristics:

- Former wetlands that have been effectively drained for agricultural purposes (prior converted cropland);
- Former wetlands that may be degraded;
- Existing wetlands that are degraded, such as by partial drainage;
- Wetlands in agricultural production (farmed wetlands);
- Areas connected to existing nontidal wetlands, waterways or within the 100-year floodplain;
- Disturbed areas, such as sand and gravel mines; and
- Areas accessible to earthmoving equipment.

Areas that will not generally be conducive for wetland mitigation are:

- Upland forested areas;
- Areas identified as important habitat for rare, threatened, and endangered plant and wildlife species (although enlarging or enhancing these habitats is encouraged);
- Areas with moderate or steep slopes;
- Known toxic sites;
- Dredge disposal areas, excluding beneficial use projects; and
- Areas with incompatible adjacent land uses, such as commercial development and highways that will be a source of pollutants.

The preferred project type is wetland restoration. Sites that were formerly wetlands usually have a source of water that can be returned to the former conditions. The best example is the restoration of effectively drained agricultural fields listed as prior converted cropland by the Natural Resources Conservation Service.

Sites where wetland creation projects can be done should be investigated second. These sites will require grading to reach an elevation where wetland hydrology can be sustained. The likelihood of a successful creation project is generally viewed to be less than that for a restoration project and creation projects may not fit in the landscape as well as restoration

projects.

If adequate restoration and creation sites cannot be found to meet acreage requirements, wetland enhancement projects may be proposed. Enhancement projects replace lost functions but not lost acreage of wetlands.

To increase the probability that sufficient water will be available to supply wetland hydrology, mitigation sites should be located adjacent to existing nontidal wetlands, streams, or 100-year floodplains whenever possible. Accurate interpretation of soil boring data is important to ensure that sufficient hydrology will be achieved. For projects where groundwater is the main source of hydrology, groundwater monitoring will also be necessary to determine if the water table is close enough to the surface for the site to be feasible.

Mitigation projects may be on multiple sites, but single sites are recommended. Single sites will be larger, resulting in greater potential for protection and management and greater value as wildlife habitat. Single sites are also easier to monitor, and land purchase and site preparation costs will usually be reduced.

MITIGATION OPTIONS AND SITE SELECTION

What is the process for selecting mitigation options and sites?

A permittee or person conducting an agricultural activity can propose, or the Department can require, any of the options in this section for fulfilling mitigation requirements. The proposed option will be submitted as part of the Phase I mitigation plan, which will be submitted with the permit application.

Option 1: Approved Mitigation Bank

Mitigation banking involves the creation, restoration, and enhancement of nontidal wetlands to compensate for future wetland impacts from multiple projects. Mitigation banks are established in anticipation of future needs for mitigation projects within a watershed.

From an environmental viewpoint, some advantages of mitigation banking include:

- The likelihood of success of the mitigation project is increased.
- Conducting the mitigation project before existing wetlands are impacted can reduce or eliminate the lag time between losses of values and replacement of those losses.
- Grouping several mitigation projects at one site results in a larger wetland than would have been created otherwise. Larger wetlands have potentially more water quality and wildlife habitat benefits than a higher number of smaller wetlands, and they are easier to manage and monitor.

Mitigation bank sites must meet approved success standards and monitoring requirements as other mitigation sites, although the monitoring period is usually longer for banks. The wetland mitigation bank sponsor must have a financial assurance for the cost of the entire project prior to the release of any wetland credits. Since the wetland mitigation bank is constructed prior to release of the majority of wetland credits, if the bank does not appear to be developing into a successful wetland, credits can be withheld until it is remediated. Banks also have money set aside for remediation. Long-term management is also a requirement of Mitigation Banks.

What Is the Process for Developing a Mitigation Bank?

Creation of new mitigation banks can be proposed through the development of a banking prospectus and banking instrument that is reviewed by an Interagency Review Team (IRT). The IRT will include representatives from the Corps and MDE, who may co-chair the group. Additional members may include representatives from other federal, state, and local regulatory

and resources agencies, including EPA and DNR. A site that has more area on which wetlands can be created than are required for the applicant's project may be proposed for use as a mitigation bank. New bank sites can also be proposed when there is no current wetland application, but there is an expected future wetland impact within the watershed. The Department developed the documents entitled "Prioritizing Areas for Wetland Restoration, Mitigation, and Preservation in Maryland" and "Priority Areas for Wetland Restoration, Preservation, and Mitigation in Maryland's Coastal Bays" that identify priority areas within each watershed. These documents and accompanying GIS layers should also be consulted when looking for mitigation bank sites, since they evaluate mitigation priorities using a landscape perspective. The Watershed Resource Registry is also useful to locate and select high value sites. This GIS-based model is a prioritization effort developed through close coordination between Federal, State, and County regulatory and resource agencies.

Persons interested in establishing a mitigation bank generally begin by consulting with the Department and the Corps. A field meeting is typically held to view the prospective site and advise on the technical capability of the site to support wetlands. Prospective mitigation bank operators (sponsors) must submit a Prospectus to the Department and the Corps. When this has been approved, they will develop the Mitigation Bank Instrument. Among other things, this will include conceptual and final design plans, arrange to post a bond or other financial assurance, and propose a long term protection mechanism. The proposal to establish a bank will be placed on public notice to solicit public comment. A banking agreement is signed between the bank sponsor and the IRT. The agreement details specific information about the bank, confirms the amount of credit that is available, and describes how accounting will take place. Elements required for a complete mitigation bank prospectus and instrument are included in Appendix B, however this may be periodically revised.

MDE maintains a list of approved mitigation banks. Approved mitigation banks may be used to fulfill required mitigation in the following circumstances:

- Permittee-responsible mitigation does not have the potential to restore exceptional resources.
- The Department has approved the use of the mitigation bank.
- Impacts are within the mitigation bank designated service area or area determined by the Department.
- The mitigation bank has available credits.
- The bank or consolidated site replaces lost acreage and function of the authorized wetland loss, or desired wetland functions.

<u>Option 2: Onsite mitigation that supports the wetland conservation goals of a Department-approved watershed or regional plan.</u>

If possible, lost nontidal wetland functions should be replaced within the same ecosystem and functional watershed as the destroyed wetland. Therefore, mitigating for nontidal wetland losses on the site of the wetland loss (onsite) should be evaluated, especially when it supports

watershed and regional plans. Onsite mitigation should be ruled out if any of the conditions previously listed in the section entitled General Mitigation Site Selection Criteria conditions result in a site not being conducive for mitigation.

Option 3: Offsite mitigation where regional or watershed needs and goals for nontidal wetlands functions strongly justify the siting of mitigation projects.

When onsite mitigation is not feasible and use of an approved mitigation bank is not appropriate, offsite restoration and creation opportunities should be pursued. The site search should begin within the same watershed (eight-digit State watershed segment) and then expand into increasingly larger subwatersheds. Consideration is also given to sites that are in the same county as the authorized wetland loss. Regional or large scale planning efforts for watershed management or wildlife habitat or water quality improvement have also identified suitable sites, and should be consulted. The Department developed the documents entitled “Prioritizing Areas for Wetland Restoration, Mitigation, and Preservation in Maryland” and “Priority Areas for Wetland Restoration, Preservation, and Mitigation in Maryland’s Coastal Bays” that identifies priority areas within each watershed. The Department is also on an interagency workgroup to develop a State-wide GIS-based Watershed Resource Registry (WRR), which prioritizes areas for wetland restoration and preservation, riparian restoration and preservation, upland restoration and preservation, and stormwater restoration and preservation. The WRR State-wide data should be complete in early 2011. These documents and accompanying GIS layers should be consulted when looking for a mitigation site, since they evaluate mitigation priorities using a landscape perspective. An applicant should justify how more preferred locations in the sequence were investigated and rejected, when justifying a less preferred location. The applicant should also demonstrate how the proposed mitigation site fits in with the watershed plans.

Option 4: Nontidal Wetland Compensation Fund

The Nontidal Wetland Compensation Fund is designed to accept monies from applicants who may find mitigation technically infeasible, who are unable to locate a suitable mitigation site, and where the impacts are not within a service area of any approved mitigation banks having the appropriate number and resource type of credits available. Monetary compensation may not substitute for the requirement to avoid or minimize losses of nontidal wetlands. Monies in the Compensation Fund are used only for the expressed purpose of wetland creation, restoration, and enhancement in order to achieve Maryland's goal of "no net loss" of nontidal wetlands.

A proposal to pay into the Nontidal Wetland Compensation Fund should be part of the permit application and include a justification for using the Compensation Fund as opposed to undertaking a mitigation project. Monetary compensation may be accepted under one or more of the following circumstances:

- There are no approved wetland banks with available credits, providing the same wetland functions as those lost, and with the appropriate designated service area.
- Permittee-responsible mitigation does not have the potential to restore exceptional resources.
- The size of the nontidal wetland loss is less than 1 acre and onsite mitigation is not feasible.
- The size of the nontidal wetland loss is greater than 1 acre and mitigation is not possible onsite or offsite.
- Mitigation of the impacted wetland is not feasible. For some types of wetlands, the technical expertise has not advanced to the point where it is generally agreed that successful replication of these types of wetlands is unlikely.
- The Department recommends the use of the Compensation Fund.

Monetary compensation proposals may be rejected if the Department determines that Permittee-responsible mitigation has the potential to restore exceptional resources or that the conditions listed above are not fulfilled. If the Department agrees to accept a monetary compensation proposal, the applicant must follow the document entitled Instructions for MDE Nontidal Wetland Compensation Fund Payments (Appendix D).

Compensation Fund Fee Structure

The current compensation fund fee structure (Appendix C) was derived from a study of anticipated costs to construct mitigation projects. This included costs for locating and acquiring land, designing, constructing, maintaining, and monitoring a mitigation site. The three major factors considered in developing the compensation fund fee structure in 1991 are discussed below.

1. Prevalence of Cropland Characterized by Hydric Soils

The cost estimates also considered the extent of cropland containing hydric soils in each county. It was presumed that cropland with hydric soils would be the most likely and cost-effective place to locate a mitigation site, since the area would be disturbed, was previously capable of supporting a wetland, and would likely be capable of supporting a wetland again if hydrology were restored.

The Natural Resources Conservation Service provided figures showing estimated acreage by county of cropland which contain hydric soils. Based on this information, the state was divided into two categories. Category A counties have greater than 10% of their land area in cropped hydric soils and Category B counties have less than 10% of their land area in cropped hydric soils. The placement of counties into these categories has a major impact in determining the fee which an applicant must pay as a form of mitigation.

- Category A counties include Caroline, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester.

- Category B counties include Allegany, Anne Arundel, Baltimore, Calvert, Carroll, Cecil, Charles, Frederick, Garrett, Harford, Howard, Kent, Montgomery, Prince George's, St. Mary's, and Washington.

2. Land Acquisition Costs

The costs for land acquisition are based on information provided by the Department of General Services. Costs per acre have been calculated for each county statewide averaging the typical price paid for agriculturally zoned or low density land with limited or no development potential. Land acquisition costs must be added to the design, construction, and monitoring costs to determine the full compensation fee.

3. Design, Construction, and Monitoring Costs

The costs of designing, constructing (including planting) and monitoring nontidal wetland mitigation projects were developed by surveying wetland consulting firms statewide. Firms were requested to provide design, construction, and monitoring cost estimates for creating, restoring, and enhancing nontidal wetlands on both upland and cropped hydric soils. The survey identified a major difference in the costs of designing and constructing nontidal wetlands based on soil types. Therefore, the following section has been divided into a discussion of the costs for designing, constructing, and monitoring in Category A and Category B counties.

- Category A counties contain a high percentage of cropped hydric soils (greater then 10%). Sites with these soil and land use characteristics are excellent candidates for mitigation because in many instances they have the soil type, and with limited construction, the restored hydrology necessary for establishing wetlands. The average cost for creating nontidal wetlands on cropped hydric soils was computed to be approximately $10,000 per acre.

- Category B counties do not possess a high percentage of cropped hydric soils (<10%); therefore, mitigation projects in these areas will generally be more expensive because more extensive design and earth movement during construction will be required. In particular, the cost of grading a site (usually excavation) to create suitable hydrological conditions at or near ground surface to support wetland vegetation can be very high. In establishing the fee structure for Category B counties the average cost of creating nontidal wetlands on upland sites was calculated. The figure calculated was $50,000 per acre.

This fee schedule underestimates the actual amount of money required to find, design, construct, and monitor mitigation sites. A revised compensation fund fee structure may be passed in the

near future, increasing these amounts.

Use of the Compensation Fund

A. For Development Activities

The following steps occur in approving use of the compensation fund for mitigation:

1. Applicant submits a request to use the compensation fund as part of the joint permit application. The request must include a justification to use the compensation fund based on the criteria listed in the nontidal wetland regulations (COMAR 26.23.04.07). A list and description of other sites examined, their location, and reasons why they could not be used for mitigation should be provided.

2. MDE notifies the applicant if their project qualifies under compensation fund provisions, as part of the correspondence from MDE completeness of the application and accuracy of the wetland delineation.

3. The proposal to use the compensation fund is included in the public notice for the proposed development activity.

4. MDE sends a partially completed form to the applicant or designated contact stating the amount of money which must be submitted to the Nontidal Wetland Compensation Fund.

5. The applicant follows the instructions on the form and returns it to MDE. While an example of these instructions can be found at the end of the document (Appendix D), the applicant or contact must return the forms sent to them directly from MDE to ensure proper mitigation credit.

6. MDE issues the permit or letter of authorization. The final authorization cannot be issued until the completed form and certified check has been received by MDE.

B. For agricultural activities

The steps below are followed in approving a request to use the compensation fund as mitigation for an agricultural activity:

1. A person conducting an agricultural activity submits the mitigation component of the Soil Conservation and Water Quality Plan, including a proposal to use the compensation fund, to MDE.

2. MDE makes a decision on compensation fund use within 60 days of receipt of the proposal.

3. MDE sends a partially completed form to the applicant or designated contact stating the amount of money which must be submitted to the Nontidal Wetland Compensation Fund.

4. The applicant follows the instructions on the form and returns it to MDE. While an example of these instructions can be found at the end of the document (Appendix D), the applicant or contact must return the forms sent to them directly from MDE to ensure proper mitigation credit.

5. Soil Conservation District approves final Soil Conservation and Water Quality Plan. Final approval cannot be rendered by a Soil Conservation District until the completed form and certified check has been received by MDE.

C. For Department of the Army (Corps of Engineers) Authorizations

For previously issued permits which do not include a provision for using the compensation fund:

1. Permittee sends letter to Corps and MDE to allow use of nontidal wetland compensation fund to fulfill mitigation requirements.

2. If MDE and Corps agree to this proposal, Corps amends permit by letter to permittee and provides MDE with a copy.

3. MDE sends a partially completed form to the applicant or designated contact stating the amount of money which must be submitted to the Nontidal Wetland Compensation Fund.

4. The applicant follows the instructions on the form and returns it to MDE. While an example of these instructions can be found at the end of the document (Appendix D), the applicant or contact must return the forms sent to them directly from MDE to ensure proper mitigation credit.

5. Once MDE receives the completed form and certified check from the applicant, MDE notifies Corps that the mitigation requirement has been fulfilled.

For pending and new actions that do not require MDE nontidal wetland authorization:

1. Applicant sends written request to MDE to use the compensation fund.

2. MDE notifies the permittee if they qualify to use the compensation fund and if qualified, of the amount which must be paid to MDE.

3. Corps conditions permit with use of compensation fund.

4. MDE sends a partially completed form to the applicant or designated contact stating the amount of money which must be submitted to the Nontidal Wetland Compensation Fund.

5. The applicant follows the instructions on the form and returns it to MDE. While an example of these instructions can be found at the end of the document (Appendix D), the applicant or contact must return the forms sent to them directly from MDE to ensure proper mitigation credit.

6. Once MDE receives the completed form and certified check from the applicant, MDE notifies Corps that mitigation has been fulfilled.

The Nontidal Wetland Compensation Fund can also be used when the size of the nontidal wetland loss is greater than 1 acre and mitigation is not possible onsite or offsite in the same watershed as the nontidal wetland loss. In order for monetary compensation to be permissible in this situation, at least seven potential sites (onsite plus six offsite locations) must be assessed and deemed to be unacceptable for mitigation. These sites should have been eliminated from consideration because there was no opportunity to create or restore the acreages and functions of the lost wetland on those sites. Additionally, these site searches should be utilizing the Department's documents entitled "Prioritizing Areas for Wetland Restoration, Mitigation, and Preservation in Maryland," "Priority Areas for Wetland Restoration, Preservation, and Mitigation in Maryland's Coastal Bays", and the Watershed Resource Registry.

MITIGATION TYPE SELECTION

This section describes the circumstances and provides the justification for when different types mitigation options are appropriate. In the following discussion, taking farmed wetlands out of production and returning them to a natural state, which is technically enhancement, will be considered equally desirable to wetland restoration. Each option should be explored in the order shown, and the first feasible option should be chosen.

Option A: Restoration or creation

Option B: Enhancement

When watershed-based mitigation is possible, but there is not enough acreage available to meet the required replacement ratios, the applicant may propose to replace lost nontidal wetland functions through enhancement activities plus a minimum 1:1 creation and/or restoration acreage replacement.

Enhancement activities may be accepted to replace the loss of nontidal wetland functions when an enhancement activity provides additional protection to, creates, or improves the functions of nontidal wetlands. Activities may include:

- Enhancement of farmed nontidal wetlands (e.g., planting trees in a wet crop field);
- Enhancement of degraded nontidal wetlands (e.g., removing *Phragmites*, an invasive introduced plant also known as common reed, and planting trees);
- Best management practices for agricultural activities;
- Activities consistent with plans and agreements to create or improve upon plant or waterfowl habitats or water quality (e.g., creating shallow water areas around an existing pond);
- Retrofit projects for water quality and quantity; or
- Stream restoration projects (e.g., stabilizing streambanks to reduce erosion problems).

An example of fulfilling this option is provided below:

Impacts				Mitigation			
Wetland Type	Impact (acres)	Impact Replacement Ratio*	Mitigation Required (acres)	Mitigation Type	Mitigation (acres)	Mitigation Type Ratio*	Mitigation Credits
Emergent	2.00	1:1	2.00	Emergent	2.00	1:1	2.00

				creation			
Scrub-shrub	1.00	2:1	2.00	Scrub-shrub creation	1.00	1:1	1.00
Forested	2.00	2:1	4.00	Forested restoration	2.00	1:1	2.00
				Farmed wetland enhancement	6.00	2:1	3.00
Total	5.00		8.00		11.00		8.00

* These ratios are expressed as a relationship between two numbers. The Impact Replacement Ratio is the acreage of nontidal wetlands to be mitigated to the acreage of nontidal wetlands lost. The Mitigation Type Ratio is the acreage of the specific mitigation type to the credit for that mitigation type.

The enhancement of farmed wetlands for this project would include planting forested and scrub-shrub species in a wetland where crops were formerly grown. Six acres of farmed wetland revegetation credit would fulfill the additional three acres of mitigation that was required due the 2:1 replacement ratios for impacts to forested and scrub-shrub wetlands. The amount of credit to be given for different types of enhancement projects will be decided on a case-by-case basis.

For enhancement projects that cannot be measured on an acreage basis, the amount of enhancement credit will be based on the amount of money that it costs to complete the project and on the increase in function that the enhancement would provide over the existing state.

While ratios for wetland enhancement projects are determined on a case-by-case basis, examples of ratios for wetland enhancements (e.g. degraded EM to FO, farmed wetland to FO, etc.) may be 2:1-3:1. Invasive plant removal (e.g. controlling *Phragmites*, but not planting trees) will get a lower ratio, possibly 10:1, if it is allowed as mitigation.

In order for enhancement activities to be accepted toward replacement of lost nontidal wetlands functions, a functional assessment of the impacted wetland may be required. This assessment will help determine goals for mitigation projects and what types of enhancement activities could replace specific lost wetland functions. Unfortunately, wetland assessment methods are continuously under development and often fall into disfavor over time. Contact MDE for the most recent suggested method for your project.

There are also larger scale assessment methods being developed for watershed planning. FUGRO East prepared “A Method for the Assessment of Wetland Function” for MDE under State Wetland Program Development Grant 003617-01-2. This functional assessment method applies basic principles of hydrogeomorphic assessment and includes both field and office procedures. It is available from the Nontidal Wetlands and Waterways Division. Virginia Tech and Virginia Institute of Marine Science prepared a wetland assessment template in 2010 for

MDE entitled “Development of a Level 3 Wetlands Assessment Template.” Sources for assessment methods may be found in Appendix A. .

Mitigation consisting only of enhancement activities may be approved by the Department when it is not feasible to restore or create wetlands. For example, enhancement may be the best mitigation option when there is an impact to a farmed wetland. The enhancement may involve taking additional farmed wetlands out of crop production and allowing them to revert to a natural wetland state.

Enhancement of a nontidal wetland of special State concern may be ranked as a higher option. Suitable enhancement options in these wetlands may include vegetation management to favor natural or rare community, additional buffers, and hydrology maintenance.

Option C: Preservation

Preservation may be acceptable in conjunction with other types of mitigation. Wetland preservation generally receives one tenth as much mitigation credit as restoration or creation, according to the Interagency Mitigation Task Force guidelines. Preservation of nontidal wetlands of special State concern can receive more mitigation credit, such as one fifth as much as restoration or creation. Preservation of habitat for bog turtles, listed as Federally threatened in November 1997, can be given the same one fifth credit. Since all wetlands are given some protection through the Regulations, preservation to satisfy mitigation requirements should be considered mainly for areas that provide exceptional function or act as protective buffers for these important areas. Additionally, areas that are under threat (e.g. development pressure) will be given higher priority.

Option D: Out of kind

When Options 1 through 8 are not feasible, or other alternatives are specified in watershed management plans, the applicant may propose out-of-kind mitigation. Some examples include stream restoration to restore floodplain connectivity, planting and protecting stream buffers, or storm water management in older developments pre-dating the stormwater requirements (must be in addition to any stormwater management requirements). These will be considered on a case-by-case basis and consideration will be given to how the proposed mitigation replaces the lost wetland functions and the needs of the impacted watershed.

Another example for this category is a stream restoration project that could be accepted as mitigation for a road crossing of a degraded stream and a forested floodplain wetland. The project could include stabilizing eroding streambanks, removing trash, and creating depressions that may be used as breeding pools by amphibians.

Ratios for out-of-kind mitigation will be considered on a case-by-case basis. Example ratios may be 4:1-5:1 for riparian/floodplain upland reforestation, 10:1 upland reforestation, and 20:1 for upland preservation (may get higher ratios if preserve important buffers to WSSC, etc). For out-of-kind projects that cannot be measured on an acreage basis, the amount of enhancement credit will be based on the amount of money that it costs to conduct the enhancement and the increase in function that the enhancement would provide over the existing state.

MITIGATION ASSISTANCE

What assistance is available to locate mitigation sites?

Once onsite mitigation has been ruled out, other potential mitigation sites need to be located. The Nontidal Wetlands and Waterways Division may already have a list of potentially available sites (including mitigation banks) within the watershed where the impact occurred. Persons who are willing to allow mitigation on their property may notify MDE and receive conceptual approval that their site is technically suitable for establishing wetlands. The site may be listed in a database with the information being available to persons who need a mitigation site. The Maryland Department of the Environment's study entitled "Prioritizing Sites for Wetland Restoration, Mitigation, and Preservation in Maryland" identifies mitigation opportunities within each watershed. This study included a text portion and accompanying maps. The U.S. Environmental Protection Agency, in conjunction with Maryland Department of the Environment, Department of Natural Resources, Maryland State Highway Administration, the U.S. Army Corps of Engineers, and other organizations is working to develop a Watershed Resource Registry that will identify potential wetland mitigation sites for certain regions. This registry will be completed for the entire State. In addition, the BayBank (www.thebaybank.org/) is being developed to connect interested landowners with potential restoration opportunities.

Other maps and sources of information may also need to be examined. National Wetland Inventory maps, Department of Natural Resources wetland maps, and county soil surveys can be downloaded from the internet as GIS files, or can be viewed on internet mappers (e.g., Merlin, NRCS Soil Data Viewer). Current listings of property for sale in the watershed can be obtained from real estate companies. Environmental consulting firms (see Appendix J) can also be hired to conduct thorough searches for potential sites.

What Information Sources Will Help in locating a Mitigation Site?

As discussed earlier, many mitigation sites will be located adjacent to existing wetlands. Several sources can be used to help locate potential mitigation sites adjacent to existing wetlands, including:

- Detailed elevation data, available for some areas.
- National Wetlands Inventory (NWI) wetland maps, Department of Natural Resources (DNR) wetland maps, and USFWS National Wetland maps for Nanticoke and Coastal Bays watersheds, and Nontidal Wetlands Guidance (NWG) maps. NWI and DNR wetland maps show the types of existing mapped wetlands (forested, etc.) and their approximate boundaries. These wetland maps are available as GIS layers (see Appendix A). NWG maps are paper maps that

are useful for those without GIS capabilities, since they show the same wetlands as NWI maps, but with a photographic background that is useful for determining habitat types over large areas.

- Flood Insurance Rate maps (FIRM), put out by the Federal Emergency Management Agency (FEMA), show the approximate locations of 100-year floodplains.
- County soil surveys, when used with hydric (wetland) soils lists, show locations of hydric soils, soils with hydric inclusions, and upland soils. They are available through the online NRCS Soils Data Mart (see Appendix A) and can also be viewed through the NRCS Soil Data Viewer internet site. Information can also be found through the county Soil Conservation Districts.
- County Soil Conservation District (SCD) and Agricultural Stabilization and Conservation Service (ASCS) offices may be aware of farmers with farmed wetlands or prior converted cropland that they would be willing to sell. Visit their website (www.md.nrcs.usda.gov/contact/) to find their contact information.
- Regional foresters.
- Stream GIS layers, including streams listed as Tier II (high quality) and their contributing basins, and 303d (impaired).
- Stronghold streams.
- Aerial photographs.
- Land use maps.
- Documents and GIS layers developed by MDE entitled "Prioritizing Sites for Wetland Restoration, Mitigation, and Preservation in Maryland" and "Priority Areas for Wetland Restoration, Preservation**,** and Mitigation in Maryland's Coastal Bays."
- Watershed Resource Registry.
- United States Geological Survey (USGS) topographical quadrangle maps, which show the existing land elevations and the locations of some wetlands and streams.

Information on streams, soils, watershed boundaries, wetlands, floodplains, property information, detailed photography, elevations, and land use is available to use on Geographic Information Systems. Manipulation of the data layers can reveal potential mitigation areas that are in close proximity to other wetlands, streams, floodplains, and land uses suitable for establishing wetlands, but are not currently in forested or developed areas. Many of the above data layers, as well as others, are available for free download from various sources (see Appendix A). In the near future, many of these layers should be available for viewing through an online mapper called Maryland iMap. This system will allow the public to go to a website to view all the important GIS layers housed in various agencies. Once this is developed, it will be an excellent way to view data since it is all in one location and will be continuously updated with the most current versions. It is anticipated that the Watershed Resource Registry will also allow users to view many of these data layers via the internet.

MITIGATION PLANS

Mitigation plans consist of two parts. Phase I is the concept plan and Phase II is the detailed design plan.

What is included in Phase I of the Mitigation Plan?

In order for a permit application to be considered complete, all of the information required in the Phase I mitigation plan, detailed in Appendix E Phase I Mitigation Plan – Required Information, must be submitted as part of the application. Once the Phase I mitigation plan is complete, the Department may consider the following review points:

- How does this project fit with the MDE mitigation prioritization documents and the Watershed Resource Registry?

- Will the proposed project satisfy the mitigation requirements? Is the site large enough to fulfill all of the requirements or is an additional payment to an approved Wetland Mitigation Bank, use of an additional mitigation site, or into the MDE Wetland Compensation Fund necessary?

- Is the proposed mitigation site in an acceptable location? Has the mitigation site been located through the proper sequence of identifying sites within the same local watershed, extending out to a larger watershed when necessary?

- Are there existing wetlands at the proposed mitigation site? If there are wetlands within the mitigation site, they should be shown on the mitigation plan, and either protected from disturbance during the mitigation project or enhanced to a more natural wetland state. It is often desirable to include a connection to the existing wetland.

- How will adequate wetland hydrology be obtained? If there is a high degree of manipulation required to achieve the desired hydrology (e.g. extensive depth of grading), the project may have a lower predicted success.

- Wetland mitigation cannot be completed on land that is also required by another program to replace a different resource (referred to as double-dipping). For example, if one acre of emergent wetland and one acre of upland forest are impacted (for a total of two acres impact), you cannot replace just one acre of forested wetland. However, if you impact one acre of forested wetland, with MDE requiring mitigation for the wetland loss and the county requiring mitigation for the forest loss (but they are actually the same resource you are mitigating for), you can restore both in the same area.

- Wetland mitigation cannot be used to satisfy the stormwater management requirements. Wetland mitigation must be in addition to these requirements. Any mitigation proposed in a stormwater pond must take into account maintenance of that stormwater facility, making sure the wetland mitigation is sustainable and will not be disturbed by maintenance. In many cases, it may be more appropriate to design the stormwater pond to outfall into the wetland mitigation site.

- The wetland mitigation site should be designed to fit into the landscape setting (e.g. side slopes should be >6:1 whenever possible).

- Are the adjacent existing and projected land uses compatible with a wetland mitigation site? For example, a proposal to create a wetland within a highway cloverleaf may be rejected since there is no means for wildlife migration.

What is included in Phase II of the Mitigation Plan?

After Phase I of a mitigation plan has been approved, the Phase II mitigation plan, detailed in Appendix F Phase II Mitigation Plan – Required Information, must be submitted. Once the Phase II mitigation plan is complete, the Department may consider the following review points:

- Were the wells installed properly? It is very important to select the correct instrument (well versus a piezometer) and install them correctly (to the correct depth and following the protocol so they are sealed correctly), as discussed in documents found in the Wells/Piezometers section of Appendix A. It is also discussed in the document entitled "Development of a Level 3 Wetland Assessment Template." Is it a perched or groundwater driven system? Understanding the source of hydrology is very important in the success of the mitigation. Soil profile descriptions are important because they determine appropriate well depths. Soil profiles should be assessed to identify layers that may restrict downward water movement and create a perched water table. If a restrictive layer is identified, this should not be penetrated when installing the well. Instead, the well should be installed no deeper than to the top of the restrictive layer. If wells are installed incorrectly, the water readings will be wrong and the wetland mitigation site designed from these water readings will likely fail. A minimum of one growing season worth of data should be collected.

- Do groundwater measurements show information necessary to determine how deep to grade? What time of year were the measurements taken? Were the measurements taken soon after any precipitation events? If the measurements were taken only during the dry season or in a drought year, the normal groundwater level during the growing season may be much higher than expected. If some measurements were taken after precipitation events, they may indicate an artificially high water table.

- Is the grading plan appropriate when compared with groundwater/hydrology measurements? If the grading is to be much lower than the normal high water table level, then the project may be wetter than expected and/or cost much more than necessary. If the grading is to be much higher than the normal high water table level, then the project may not achieve sufficient hydrology to support a wetland.

- Is open water proposed as mitigation? Creation or restoration of open water areas up to eighteen inches deep may receive credit as emergent mitigation. However, often emergent vegetation does better at depths of up to six inches. Deeper water will not be as likely to support emergent vegetation and will result in a project that does not meet the required performance standards.

- Are species on the planting list native to the area of the mitigation project? Native species have a greater chance of surviving in the local soils and hydrology conditions and less chance of forming a monoculture stand. All species planted or seeded in the wetland should have an Indicator Status of Obligate, Facultative wet, or Facultative. No more than 50% should be Facultative. An approved list of wetland indicator status for each plant species can be found in the 1988 document entitled "National List of Plant Species that Occur in Wetlands: Northeast Region." This list is currently being updated. Species planted or seeded in the wetland buffer should also be native or non-persistent. For native status, the NRCS Plants Database (http://plants.usda.gov/) is a good source. The plant species should not only be native to the State, but also to that region. Since that is not differentiated in the NRCS Plants Database, more local lists will have to be utilized when a species is in question.

- Both permanent and temporary seed stabilization mixes should also only include native or nonpersistent annual species for the wetlands and wetland buffers (ex: *Lespedeza cuneata* is not permitted). However, the selected species should allow enough vegetative cover to stabilize the site and prevent erosion.

- If managed water control structures are proposed, will there be a sufficient management and maintenance group responsible? Managed water control structures should only be approved on properties with a long term management group in place, usually a government agency.

- Do the plans specify the inclusion of microtopography?

- Drawings should show the location and extent of any inholdings, easements, or right-of-ways on or adjacent to the mitigation site.

- Have approved Erosion and Sediment Control Plans been submitted to the Department?

- What is the estimated start and completion date for construction and planting?
- Is the site designed to be self-sustaining?

MITIGATION BONDING

What are the bonding requirements for mitigation projects?

Non-government permittees must assure the State that required mitigation projects will be completed. This requirement can be fulfilled by completing the mitigation project before the wetland impact project. In most circumstances, however, permittees will conduct the mitigation project simultaneously or even after the impact project. The financial assurance requirement will be fulfilled by filing a type of security that will be returned after the mitigation project has been successfully completed. Securities include:

- Surety bonds;
- Irrevocable letters of credit;
- Deposits of cash or negotiable bonds;
- Certificates of deposit; or
- In trust grants of a deed, easement, or other interest in upland property

If necessary, the selected security should be filed with the Department prior to issuance of the authorization. The amount of a bond or other type of security is $20,000 per acre of nontidal wetlands mitigation required. The regulations may be revised shortly to adjust the bond requirement to match the nontidal wetland compensation fund fee schedule.

Surety bonds and irrevocable letters of credit allow a permittee to post a bond without putting up the full bond amount. In the case of wetland mitigation, a surety bond is an agreement under which a surety company guarantees to the State that the permittee will complete construction of the required mitigation project(s). If the permittee does not fulfill the mitigation requirements, the surety company must complete the mitigation project or pay the State the amount of the bond. For this reason, surety companies will only give bonds to established, well-run companies and financially stable individuals. The bond will be released after the mitigation project has been successfully completed.

Surety bonds are available from some insurance companies and generally cost from one to five percent of the bond amount. For example, the cost to bond a two acre mitigation project at $40,000 could be as low as $400. Letters of credit are available from banks where the permittee has established a good credit rating.

If the permittee cannot obtain a surety bond or letter of credit, he must put up the full bond amount in the form of a deposit of cash or negotiable bonds, or a certificate of deposit. Permittees can also grant, in trust, a deed, an easement, or other interest in upland property to the Department. The property must be worth at least as much as the amount of security required.

The security may be forfeited to the Department if:

- The permit is revoked; or
- The permittee does not comply with an administrative order or any element of the approved mitigation plan, soil conservation and water quality plan, or modifications

Bonds should be written so that they are only released upon Department notification, and are extended automatically until ordered released or revoked by the Department.

Upon notification that a security may be forfeited, a permittee will have an opportunity to correct any problems. If the problems are not corrected, the bank may have the project completed to avoid forfeiting the security amount to the State. If the security is forfeited to the State, the money will be used to complete the mitigation project.

Bonding for Mitigation Banks

In addition to the bonding options above, a mitigation bank operator may perform mitigation on another site acceptable to the Department as a form of security. Unless the Department authorizes an earlier release or forfeiture, liability under the bond extends through the end of the monitoring period for the site (specified in the banking instrument) or until the last credit is withdrawn, whichever is later.

What assistance is available regarding bonding?

The Nontidal Wetlands and Waterways Division can assist applicants with security arrangements for individual projects. For general information about surety bonds and to find a bond provider, contact the National Association of Surety Bond Producers (NASBP) or the Surety and Fidelity Association of America at the following addresses:

National Association of Surety Bond Producers
1140 19th Street, Suite 800
Washington, DC 20036-5104
tel: 202-686-3700 fax: 202-686-3656
http://www.nasbp.org

Surety and Fidelity Association of America
1101 Connecticut Avenue, NW, Suite 800
Washington, DC 20036
tel: 202-463-0600 fax: 202-463-0606
http://www.surety.org/

The NASBP gives out names of agencies specializing in surety bonds. Insurance agents and

brokers working for these companies can issue surety bonds or review surety bonds for proper execution.

To locate and find out about companies licensed to write surety bonds in Maryland, contact the Maryland Insurance Administration:

Maryland Insurance Administration
200 St. Paul Place, Suite 2700
Baltimore, MD 21202
410-468-2000

CONSTRUCTION PROCESS

How should the wetland be constructed?

The designer of the mitigation plan should supervise the construction and revegetation phases. Soil elevations, grades, and hydrology should interact to produce conditions that will ensure successful plant establishment and will resemble the lost wetland, a similar, reference wetland, or other desired wetland. The project must comply with the Best Management Practices (Appendix G), conditions of the permit (if applicable), and the approved Phase II Mitigation Plan (e.g. locating stockpile material out of wetlands, restoring temporary construction access, etc.). Since the fine-tuned grading is so important for the success of the mitigation site, the project manager should have experience in wetland construction. The project should be monitored frequently to assure that the wetland is being created successfully and that sediment and erosion control measures are working. Daily onsite management may be necessary for complex projects with strict construction conditions. Midcourse corrections to ensure success should be conducted as soon as problems are detected. For example, the project manager should oversee the grading details and be capable of making grading adjustments to allow for adequate wetland hydrology if the site conditions are not as originally expected. They should also oversee the inclusion of microtopography and course woody debris to improve the site habitat. Notify the Mitigation and Technical Assistance Section upon the start of grading and the completion of planting of the mitigation project. Submit an "as-built" site design plans, including any midcourse corrections, to the Mitigation and Technical Assistance Section within 120 days of the completion (including grading, planting, and/or vegetative stabilization) of the mitigation project. Subsequent monitoring reports shall detail any modifications to the "as built" plan.

PLANTING MITIGATION SITES

What plant species should be used?

The dominant native species in each stratum (trees, shrubs, herbs) of the destroyed wetland should be planted at the mitigation site, unless the dominant species are invasive or otherwise inconsistent with a different project goal. A list of species comprising greater than ten percent of each stratum, based on best professional judgment, should be obtained to determine the species to be used at the mitigation site. If the species of plants that were present in the destroyed wetland are not known, or there were no plants on the site, species present in the nearest accessible wetland of the same type (forested, scrub-shrub, or emergent) should be planted on the mitigation site. Each species should be planted in a random or clumped pattern that reflects their spatial distribution and density in the destroyed or reference wetland. All species planted within the wetland and wetland buffer shall be native to that region of the State. Only native or non-persistent grasses should be seeded for erosion and sediment control according to Natural Resources Conservation Service guidelines. With the exception of temporary stabilization species, all species planted in the wetland should have an Indicator Status of Obligate, Facultative Wet, or Facultative. No more than 50% shall be facultative.

Planting for forested wetlands should include a minimum of 538 trees/shrubs per acre (9x9 spacing), including at least 250 trees/acre. Scrub-shrub wetlands should have a minimum density of 435 shrubs/acre (10x10 spacing). Densities for emergent planting vary from 12”x12” to 24”x24”, with the lower densities used for species that spread with rhizomes. Wetland seed mixes may also be used in combination with plantings to increase diversity and density of native species.

Where can the plants be obtained?

In ideal cases where mitigation is being done concurrently with the destruction of wetlands, some species of plants can be salvaged from the wetland being destroyed and replanted in the wetland being created or restored. In addition, the topsoil and rootstock from the wetland being destroyed can be moved and used as a seed source of plants, but should not be used if non-native species were present. Salvaged plants, topsoil, and rootstock should be taken directly to the mitigation site and should not be allowed to dry out.

In most cases, plants should be purchased from wetland nurseries (Appendix K). Plants that were collected in Mid-Atlantic States or were propagated from plants collected in Mid-Atlantic States should be used, because they will be genetically adapted to the area and have the best chance of long term survival.

Plants that are purchased from nurseries may be wet-cultured for one growing season before being planted. Wet-culturing involves growing plants in wet soils so that the roots will develop

laterally, increasing the probability of survival when they are planted in wetlands. To insure that plants will be available, they should be ordered at least one year before the scheduled planting date.

Natural revegetation may be allowed for projects where emergent plants and/or wetland topsoil are moved from the impact site to the mitigation site, projects that restore former wetlands, and projects on farmed nontidal wetlands. However, the plants will take longer to become established, and the monitoring requirements may have to be extended to meet the plant survival success standards (see below). If acceptable vegetation does not become established through natural revegetation, planting will be required.

What kind of plant material should be used?

The trees and shrubs are available in three different forms: bare root, containerized, or balled and burlapped (B&B). Bare root plants are sold as just the plants without soil. The containerized plants are sold in a potting container with soil - the pot is removed before planting. The balled and burlapped plants are removed from the ground with the surrounding soil and the root base is covered in burlap to hold the soil around the roots. Container-grown trees and shrubs and peat-potted emergents generally survive better than bare-rooted plants and ball and burlapped trees. Bare-rooted plants should not be planted after leaves have appeared on trees (late April). Bare-root plants need to be handled more carefully than container plants, or significant mortality will occur. For instance, prior to planting, their roots should remain moist at all times. Container-grown and ball and burlapped plants can be planted throughout the growing season, however, survival will be higher if they are not planted during the hot dry summer. Ideal planting periods for container-grown trees and shrubs in Central Maryland is from April 1 through June 15 or September 1 through November 15. Since B&B plants have a higher amount of root disturbance, they are more sensitive to the hot dry weather and should be planted when it is a bit cooler. In Central Maryland this is from March 15 through May 30 or September 15 through November 15. Bareroot material should be installed in the spring, before it gets too warm and they start “leafing out”. This is usually between March 15 and April 20 in Central Maryland. Live stakes may also be utilized in some situations, including being incorporated into stream restoration designs for bank stability. These must be planted during the dormant period. For Central Maryland, this may be between December 1 and March 15. For planting projects outside of Central Maryland, planting dates should be adjusted based on local climate patterns. All of these plant types may require supplemental watering during hot dry periods.

Most mitigation projects should use 1-3 feet tall trees and shrubs in 2 or 3 gallon containers. This size of tree is readily available and easy to transport to mitigation sites. Larger trees may be advantageous if damage from animals is expected. However, the cost to purchase and install this large-sized material is much greater. Larger trees should be staked for the initial establishment period.

Protection from animal damage should be addressed. If deer, beaver, geese, voles, etc. are expected to be a problem, the plants should be protected against damage. To reduce deer damage, tree tubes may be a good option. It is very important that they are installed properly. They must be buried in the ground so voles and field mice are not able to get under the tubes and girdle the trees at the base. An electric fence may also be used in certain locations. Tree stakes and tree tubing must be removed prior to monitoring termination in order to reduce tree girdling.

MITIGATION SUCCESS STANDARDS

What success standards are required for mitigation projects?

Compensatory mitigation projects required as a condition of a State Nontidal Wetlands and Waterways Permit for wetland impacts should achieve the goals and objectives established in the approved Phase II Mitigation Plan. Mitigation projects shall conform to the following criteria by the end of the five year monitoring period, unless otherwise agreed to by the regulatory agencies.

a. Greater than 85% of the wetland mitigation site shall be vegetated (either by planted or naturally revegetated plants) by native wetland species similar to those found in the nontidal wetland lost or by a species composition acceptable to the Nontidal Wetlands and Waterways Division. Vegetative communities not acceptable to the Division would include those communities dominated by common reed (*Phragmites australis*) or other nuisance vegetation, or communities which are dominated by facultative upland or upland species.
b. The entire wetland restoration or creation area must have wetland hydrology, defined as 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability). For the purpose of this determination, the growing season is based on two indicators of biological activity that are readily observable in the field: (1) above ground growth and development of vascular plants and (2) soil temperature as an indicator of soil microbial activity. These indicators of biological activity shall be used for determinations of growing season (as related to the hydrological indicator) and are more fully described in the appropriate regional supplement to the Corps of Engineers Wetland Delineation Manual.
c. The entire wetland restoration or creation area must meet the Hydric Soil Technical Standard (Technical Note 11) developed by the National Technical Committee for Hydric Soils for saturated conditions and aerobic conditions:
    1. Free water must exist within 10 inches of the ground surface for at least 14 consecutive days; and
    2. Anaerobic conditions must exist within 10 inches of the ground surface for at least 14 consecutive days. Anaerobic conditions may be determined by one of the following methods, as detailed in the Hydric Soil Technical Standard:
        i. Positive reaction to alpha-alpha Dipyridyl, determined at least weekly.
        ii. Reduction of iron determined with IRIS tubes installed for 30 days.
        iii. Measurement of redox potential (Eh) using platinum electrodes, determined at least weekly.
d. The site shall provide the functional goals and objectives established in the approved Phase II Mitigation Plan.

Projects that provide unique aquatic habitat (e.g. bogs, vernal pools, etc.) and out-of-kind

mitigation may have different performance standards, as specified in the Phase II approval.

MONITORING OF MITIGATION SITES

What are the monitoring requirements for mitigation projects?

To ensure the success of mitigation projects, annual monitoring reports must be submitted for five years after construction has been completed. Annual monitoring reports must be submitted by December 31 of the year in which the mitigation planting occurs, unless planting occurs after April 15, in which case the first monitoring report will not be due until the end of the next year. This period may be shortened if the Department determines that the monitoring requirements have been fulfilled in less than five years. If the mitigation project fails to comply with regulations, the Department may extend the required monitoring period for an additional period. If the U.S. Army Corps of Engineers requires a longer monitoring period, the Department may also require a longer monitoring period. Monitoring reports sent to the Corps should also be sent to the Nontidal Wetlands Division. In the case of longer monitoring periods, monitoring reports may not be required every year, but will be determined by the Corps and MDE.

The annual reports should include the following information:

- A description of how the mitigation project meets the mitigation requirements, performance standards, and goals;
- Photographs of the mitigation project;
- Dominant plant species;
- The percent cover by native plants with a wetland indicator status of FAC or wetter;
- Percent cover of invasive plant species;
- Survival of the planted species;
- For forested or scrub-shrub systems, the estimated number of planted and volunteer native trees/shrubs per acre greater than 10 inches tall;
- Observed hydrology (e.g. saturated to surface, etc.), which may include well data;
- The percent of the site with adequate wetland hydrology and how that was determined;
- The percent of the site showing active soil reduction and how that was determined; and
- A description of any modifications which have been made or need to be made to satisfy the mitigation requirements.

Exotic plant species such as common reed (*Phragmites australis*), multiflora rose (*Rosa multiflora*), purple loosestrife (*Lythrum salicaria*), Asiatic tearthumb (*Polygonum perfoliatum*), thistle, etc., should be removed from mitigation sites.

Vegetation growth and survival should be measured using techniques similar to those recommended in the Maryland Compensatory Mitigation Guidance document developed by the

Interagency Mitigation Task Force and A Citizen's Guide to Monitoring Nontidal Wetland Mitigation Sites: A Methods Manual (available from the Division). The documents describe how to monitor sites of various sizes and how to set transects and sample representative areas of a large site. Appendix H describes all the information required in the monitoring reports.

PROTECTION OF MITIGATION SITES

What protection measures must be applied to mitigation sites?

After construction of the mitigation site is completed, most mitigation projects must be protected in perpetuity through one of the following protection mechanisms:

- Deeding the wetland to an organization or public agency capable of protecting the area in perpetuity
- Conservation easements
- Deed restrictions
- Restrictive covenants

Deeding the Wetland

There are several organizations and public agencies that may be willing to accept ownership of a property. Examples include The Nature Conservancy, local land trusts, and the Department of Natural Resources. However, this option may only be applicable if it is a large site and/or it provides exceptional ecological value.

Conservation Easement

An easement is a written agreement in which there is an interest in land owned by another that entitles its holder to a specified limited use or enjoyment. Ownership of the land never exchanges hands. In the case of a conservation easement, the land in which there is an interest by another is not actively utilized, but conserved or safeguarded. Conservation easements are usually the most protective and permanent protection mechanism.

Deed Restrictions

A deed restriction is a limitation on the deed, limiting the use or enjoyment of the property.

Restrictive Covenants

A restrictive covenant is a provision in a deed limiting the use of property and prohibiting certain uses. A restrictive covenant is recorded on the deed with the county land records. An example of a restrictive covenant is in Appendix I.

What are the Provisions in a Protection Mechanism?

Protection mechanisms must include provisions on the following:

1) Language granting the Department, or any successor agency, access to the mitigation site for future inspections and for construction of the mitigation project in the event that the permittee or person conducting an agricultural activity forfeits the bond and the Department decides to complete construction of the mitigation project;

2) In the case of an easement agreement, language allowing assignment of a permittee's or person conducting an agricultural activity's interest under the easement agreement to the Department, if the bond is forfeited and the Department decides to complete construction of the mitigation project;

3) As of the date hereof, the Mitigation Site shall be deemed jurisdictional nontidal wetlands. Owner, his personal representatives, heirs, successors and assigns shall not undertake on its own, or grant permission to others, to conduct any of the following regulated activities within the Mitigation Site or a 25 foot buffer measured outward from the perimeter of the Mitigation Site:

   (a) Draining, impounding, dredging, destruction of vegetation, or filling of the created, restored, or enhanced wetland site.

   (b) Agricultural activities shall not be conducted within the Mitigation Site or within a 25 foot wide buffer measured from the outside perimeter of the Mitigation Site.

4) Maintenance and repair activities may be authorized by the Department of the Environment and the Army Corps of Engineers if they are necessary for the site to function as designed.

5) Language that the restriction is perpetual; binding on the grantor's personnel representatives, heirs, successors, and assigns; and runs with the land.

What assistance is available regarding protection of mitigation sites?

Obtaining a Declaration of Restrictive Covenants (Appendix I) is a relatively easy process, since there is no need for an outside group willing to take responsibility of an easement. This is recorded in the County land records. This can often be placed on top of an existing Conservation Easement (e.g. on top of a Forest Buffer Easement).

Conservation easements can be given to the Maryland Environmental Trust (M.E.T.) or local land trusts (usually in conjunction with M.E.T.). To investigate getting a conservation easement, contact M.E.T. at:

Maryland Environmental Trust
100 Community Place
First Floor
Crownsville, Md. 21032
(410) 514-7900

The key steps in getting an easement are:

- Potential easement donor contacts M.E.T. and tells them the acreage of the site and the density of residences on the site. A deed with a Metes and Bounds description or a survey plat may also be required for M.E.T. to decide if an easement should be pursued.
- M.E.T. staff visits the site and documents and photographs conservation features, structures, and land uses.
- M.E.T. staff researches the site for additional conservation features, such as endangered species habitat or unusual natural features, archeological sites, and/or historic structures. M.E.T. staff prepares a color slide exhibit.
- The easement donor and M.E.T. staff negotiate a draft deed conservation easement.
- M.E.T. staff notifies the County Executive and Council, or Commissioners, of the easement proposal, and requests comments.
- M.E.T. staff presents easement deed to the Board of Trustees for approval or rejection.
- If approved by the Board of Trustees, the easement deed is sent to the Assistant Attorney General (to check for legal form and sufficiency) and to the Maryland Board of Public Works for ratification.
- The easement donor, M.E.T. Director, and Assistant Attorney General sign the deed.
- M.E.T. staff records the deed in the County Lands Record Office.
- The original recorded deed is returned to the M.E.T. office, where copies are made for the donor, M.E.T. files, county planning director, and Department of Assessments and Taxation.
- The original recorded deed is delivered to the State Archives at the Maryland Hall

of Records.

Appendix A: Nontidal Wetlands Documents and Information Sources

Publications

Chesapeake Bay Wetlands: The Vital Link Between the Watershed and the Bay
EPA 903-R-97-002 CBP/TRS-160/97
March 1997
U.S. Environmental Protection Agency
Chesapeake Bay Program Office
410 Severn Avenue, Suite 109
Annapolis, MD 21403
http://www.chesapeakebay.net/
Order Information: 1-800-YOUR BAY

Classification of Wetlands and Deepwater Habitats of the United States
U.S. Fish and Wildlife Service
Order Information*:
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
www.ntis.gov/
703-605-6000
GPO Stock Number PB80168784
Or available for free download at:
http://www.charttiff.com/pub/WetlandMaps/Cowardin.pdf#search=%22Classification%20of%20Wetlands%20and%20Deepwater%20Habitats%20of%20the%20United%20States%22

Comprehensive Nontidal Wetland Watershed Management Plan: A Guide for Local Governments
Water Management Administration
Nontidal Wetlands & Waterways Division
Maryland Dept. of Environment
1800 Washington Blvd., Suite 430
Baltimore, Maryland 21230
Order Information: 410-537-3768

Corps of Engineers wetland delineation manuals:

- Corps of Engineers Wetland Delineation Manual – 1987

Order Information:
IWEER
P.O. Box 288
Leverett, Maryland 01054
http://www.wetlanded.com/Publications.cfm?OrderID=5126
413-548-8866
Or available for free download at: http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf

- Draft Interim Regional Supplement to the COE Wetland Delineation Manual: Eastern Mountains and Piedmont
  Available for free download at:
  http://www.usace.army.mil/CECW/Documents/cecwo/reg/EMP_Peer_Rev.pdf

- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region
  Available for free download at:
  http://www.usace.army.mil/CECW/Documents/cecwo/reg/AGCP_regsupV2.pdf

Field Guide to Nontidal Wetland Identification
Order Information:
IWEER
P.O. Box 288
Leverett, Maryland 01054
http://www.wetlanded.com/Publications.cfm?OrderID=5126
413-548-8866

Forested Wetlands of the Northeast
Environmental Institute
Blaisdell House
University of Massachusetts
Amherst, Massachusetts 01003
Order information: 413-545-2842
Environmental Institute Publication No. 88-1

Hydric soils:

- Field Indicators of Hydric Soils in the United States

  Available for free download at ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/FieldIndicators_v6_0.pdf

- Field Indicators of Hydric Soils in the Mid-Atlantic United States
  Mid-Atlantic Hydric Soils Committee
  Available for free download at http://www.epa.gov/reg3esd1/wetlands/hydric.htm

- Guide to Hydric Soils in the Mid-Atlantic Region
  Natural Resources Conservation Service
  Available for free download at http://www.epa.gov/reg3esd1/wetlands/hydric.htm

- Hydric Soil Technical Standard (Technical Note 11)
  National Technical Committee for Hydric Soils
  Available for free download at
http://soils.usda.gov/use/hydric/ntchs/tech_notes/index.html

Literature Review for Development of Maryland Wetland Monitoring Strategy: Review of Evaluation Methods

Water Management Administration
Nontidal Wetlands & Waterways Division
Maryland Dept. of Environment
1800 Washington Blvd.
Baltimore, Maryland 21230.
www.mde.state.md.us/wetlands

Mitigation guidance documents:

- A Citizen's Guide to Nontidal Wetland Mitigation Monitoring: A Method Manual
  Water Management Administration
  Nontidal Wetlands & Waterways Division
  Maryland Dept. of Environment
  1800 Washington Blvd., Suite 430
  Baltimore, Maryland 21230
  Order information: 410-537-3768
  Or available for free download at: www.mde.state.md.us/wetlands

- Maryland Compensatory Mitigation Guidance
  Water Management Administration
  Nontidal Wetlands & Waterways Division
  Maryland Dept. of Environment
  1800 Washington Blvd., Suite 430
  Baltimore, Maryland 21230

Order Information: 410-537-3768
OR
U.S. Army Corps of Engineers
P.O Box 1775
10 S. Howard St
Baltimore, Maryland 21203-1715
Order Information: 410-962-6144

Plant lists:

- 1996 National List of Vascular Plant Species that Occur in Wetlands
  U.S. Army Corps of Engineers
  Available for free download at:
  http://www.usace.army.mil/CECW/Documents/cecwo/reg/plants/l96_intro.pdf

- NRCS Plants Database
  Available for free download at: http://plants.usda.gov/

- Plant Invaders of Mid-Atlantic Natural Areas
  U.S. Fish and Wildlife Service
  Available for free download at:
  http://www.nps.gov/plants/alien/pubs/midatlantic/index.htm

- Sources of Native Plants for the Middle Atlantic Region
  The Maryland Native Plant Society maintains an excellent list of native plant suppliers. Most of these carry some native wetland plant species. It is available on their website:
  www.mdflora.org/publications/nurseries.html

- Wetland Plants
  Available for free download at:
  http://www.mde.state.md.us/assets/document/wetlandswaterways/wetplant.pdf

- Wetland Plants of the Northeast
  Available for free download at: http://swampschool.org/

Wetland maps:

- National Wetland Inventory Maps
  U.S. Fish and Wildlife Service
  View maps at: www.fws.gov/wetlands/Data/Mapper.html

Wetland prioritization:

- Prioritizing Sites for Wetland Restoration, Mitigation, and Preservation in Maryland
  Water Management Administration
  Nontidal Wetlands & Waterways Division
  Maryland Dept. of Environment
  1800 Washington Blvd., Suite 430
  Baltimore, Maryland 21230
  Available for free download at: www.mde.state.md.us/wetlands

- Priority Areas for Wetland Restoration, Preservation, and Mitigation in Maryland's Coastal Bays
  Water Management Administration
  Nontidal Wetlands & Waterways Division
  Maryland Dept. of Environment
  1800 Washington Blvd., Suite 430
  Baltimore, Maryland 21230
  Available for free download at: www.mde.state.md.us/wetlands

Protecting Wetlands: Tools for Local Governments in the Chesapeake Bay Region
EPA 903-R-97-008 CBP/TRS-168/97
April 1997
U.S. Environmental Protection Agency
Chesapeake Bay Program Office
410 Severn Avenue, Suite 109
Annapolis, MD 21403
Order Information:
1-800-YOUR BAY
www.chesapeakebay.net/
OR
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
www.ntis.gov/
703-605-6000
Stock Number: PB97161376

Protecting Wetlands II: Technical and Financial Assistance Programs for Local Governments in the Chesapeake Bay Region
EPA 903-R-98-002 CBP/TRS-195/98

February 1998
U.S. Environmental Protection Agency
Chesapeake Bay Program Office
410 Severn Avenue
Annapolis, MD 21403
Order Information:
1-800-YOUR BAY
www.chesapeakebay.net/
OR
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
www.ntis.gov/
703-605-6000
Stock Number: PB98-133416

Protocol for Using and Interpreting IRIS Tubes.
Rabenhorst, M. C. 2008
Soil Survey Horizons 49: 74-77
Order information: 410-527-4018

Soil Surveys (Available for each county in Maryland)
Natural Resource Conservation Service
J. Hanson Business Center, Suite 301E
339 Busch's Frontage Road
Annapolis, MD 21401-5534
Order information: 410-757-0861 ext. 315
View soil surveys online at: http://soildataviewer.nrcs.usda.gov/

Wells/Piezometers

- Technical Standard for Water-Table Monitoring of Potential Wetland Sites
  U.S. Army Corps of Engineers
  Wetlands Regulatory Assistance Program
  Available for free download at http://el.erdc.usace.army.mil/elpubs/pdf/tnwrap05-2.pdf

- Installing Monitoring Wells in Soils
  Natural Resources Conservation Service
  Available for free download at ftp://ftp-fc.sc.egov.usda.gov/NSSC/wells/monitoring_wells.pdf

- Installing Monitoring Wells/Piezometers in Wetlands
  U.S. Army Corps of Engineers
  Wetlands Regulatory Assistance Program
  Available for free download at http://el.erdc.usace.army.mil/elpubs/pdf/tnwrap00-2.pdf

Wetlands of Maryland
Order Information:
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
www.ntis.gov/
703-605-6000
Stock Number: PB96177290
Available for free download at: www.mde.state.md.us/wetlands

Many of the website links listed above change frequently, so the links may become broken over time. If this is the case, please look for the updated links at the MDE Wetlands website (Technical Documents section):
http://www.mde.state.md.us/Programs/WaterPrograms/Wetlands_Waterways/documents_information/technicaldocuments.asp

GIS Data

The following sites provide free GIS data downloads:

Maryland Department of Natural Resources
http://dnrweb.dnr.state.md.us/gis/data

Some of the relevant data available at this site includes:

- Critical Area
- Floodplain
- Forest Interior Dwelling Species – Potential Habitat
- Green Infrastructure
- Greenways
- LIDAR Elevation Data
- Sensitive Species Project Review Areas
- Protected Land
- Watershed Boundaries
- DNR Wetlands
- NWI Wetlands
- Wetlands of Special State Concern
- Digital Ortho Quarter Quad Photography

NRCS Soil Data Mart
http://soildatamart.nrcs.usda.gov/

Includes all official digital soil surveys and is capable of producing reports with soil information.

Brochures and Fact Sheets

The following brochures and information sheets are available, free, from:

Water Management Administration
Nontidal Wetlands & Waterways Division
Maryland Dept. of Environment
1800 Washington Blvd.
Baltimore, MD 21230.
Order Information: 410-537-3768
OR
Available for free download at: www.mde.state.md.us/wetlands

Nontidal Wetlands Regulations and Agriculture
Nontidal Wetlands Regulations and Aquaculture
Nontidal Wetlands Regulations and Forestry
Nontidal Wetlands Regulations and Development Activities
Nontidal Wetlands Regulations and the Property Owner
Nontidal Wetlands Regulations and Mitigation
Nontidal Wetlands Regulations and Mitigation Bonding
Nontidal Wetlands Classifications
The Values of Nontidal Wetlands
The Nontidal Wetlands Protection Program
Nontidal Wetlands of Special State Concern
Nontidal Wetlands Documents
Are there Wetlands on my Farm?
How to recognize a Nontidal Wetland
Are there Wetlands on my Property? – A Guide For the Developer

Other Federal Information Sources

Federal Farm Bill Programs
Natural Resources Conservation Service
http://www.nrcs.usda.gov/programs/farmbill/2002/products.html

U.S. Environmental Protection Agency
Wetlands hotline 1-800-832-7828

Assessment techniques

A Method for the Assessment of Wetland Function

Water Management Administration
Nontidal Wetlands & Waterways Division
Maryland Dept. of Environment
1800 Washington Blvd.
Baltimore, Maryland 21230.
Order Information: (410) 537-3768

Evaluation of Planned Wetlands

Environmental Concern

P.O. Box P
St-Michael, MD 21663

Development of a Level 3 Wetland Assessment Template

Water Management Administration
Nontidal Wetlands & Waterways Division
Maryland Dept. of Environment
1800 Washington Blvd.
Baltimore, Maryland 21230.
www.mde.state.md.us/wetlands

Habitat Evaluation Procedure

U.S. Geological Survey
Biological Resources Division
4512 McMurry Ave.
Fort Collins, CO 80525-3400

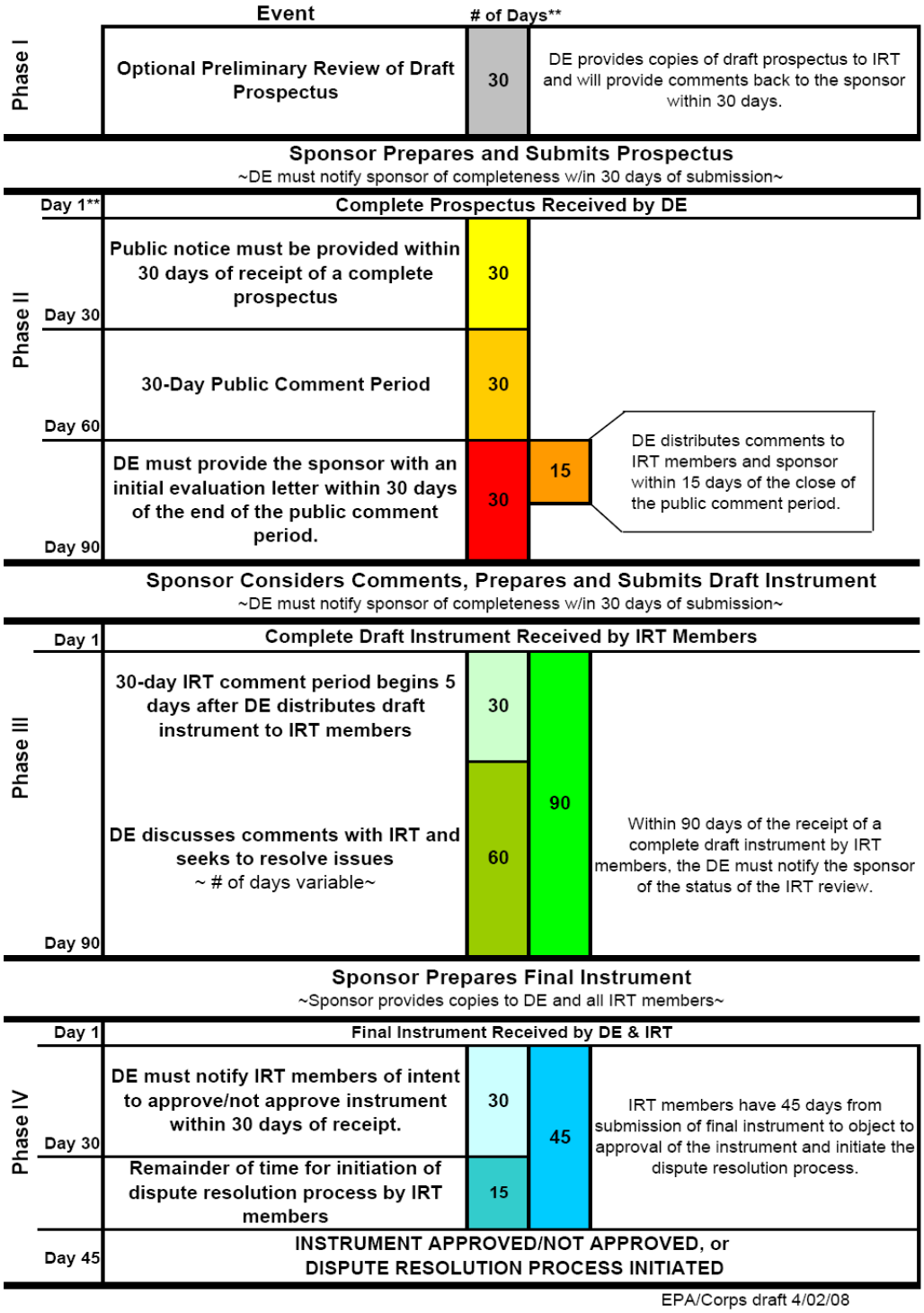
New Hampshire Method

NRCS
Federal Building.
2 Madbury Rd.
Durham, NH 03824 –1499

Appendix B: Mitigation Banking Requirements

Please Note: The Banking documents below are draft lists of the information required for the Wetland Banking process. Please check with the Division and the U.S. Army Corps of Engineers for any revisions to these documents prior to submitting your banking prospectus.

Compensatory Mitigation Rule
Timeline for Bank or ILF Instrument Approval*



EPA/Corps draft 4/02/08

Total Required Federal Review (Phases II-IV): ≤225 Days

*Timeline also applies to amendments

**The timeline in this column uses the maximum number of days allowed for each phase.

Requirements for a Complete Prospectus

Prospectus (33CFR 332.8(d)(2)/40 CFR 230.98 (d)(2))

The prospectus provides an overview of the proposed mitigation bank or in-lieu fee program and is the basis for public and Interagency Review Team (IRT) initial comment.

The prospectus must provide a summary of the information on a proposed mitigation bank or in-lieu fee program at a sufficient level of detail to support informed public and IRT comment.

A complete prospectus includes the following:

- Objectives of the proposed bank or in-lieu fee program
- How the bank or ILF will be established & operated
- The proposed service area(s)
- The general need and technical feasibility of the proposed bank or ILF program
- The proposed ownership arrangements and long-term management strategy for the bank or ILF project sites
- Qualifications of the sponsor to successfully complete the types of mitigation projects proposed, including information on past activities

For a proposed mitigation bank, the prospectus must also address:

- Ecological suitability of the site to achieve the objectives of the bank, incl. physical, chemical, & biological characteristics of the site and how that site will support the planned types of aquatic resources and functions.
- Assurance of sufficient water rights to support long-term sustainability of the mitigation bank.

For a proposed in-lieu fee program, the prospectus must also include:

- The compensation planning framework, which will be used to select, secure, and implement aquatic resource compensatory mitigation activities. The compensation planning framework is discussed in greater detail at 33 CFR 332.8(c)/ 40 CFR 230.98(c).
- A description of the in-lieu fee program account. The in-lieu fee program account is the repository for all fees collected from permittees, earnings, and interests received by the in-lieu fee program from operation as a method of compensatory mitigation. The establishment, operation, and use of the program account is discussed in greater detail at 33 CFR 332.8(i)/40 CFR 230.98(i).

Within 30 days of receipt of a complete prospectus, the DE will provide public notice of the proposed mitigation bank or in-lieu fee program in accordance with procedures at 33 CFR 325.3.

Requirements for Mitigation Bank and In-Lieu Fee Program Instruments

Mitigation bank and in-lieu fee program instruments must include the following information:

- Description of the proposed service area(s). Service areas may be based on the watershed, ecoregion, or physiographic province, and/or other geographic area in which the bank or in-lieu fee program is authorized to provide compensatory mitigation
- Accounting procedures
- Provision stating that legal responsibility for providing mitigation lies with the sponsor once a permittee secures credits from the sponsor
- Default and closure provisions
- Reporting protocols
- Any other information deemed necessary by the district engineer

For a mitigation bank, a complete instrument must also include the following information (33 CFR 332.4(c)(2)-(14)/ 40 CFR 230.94(c)(2)-(14)):

- Objectives
- Site selection factors considered
- Site protection instrument (conservation easement, declaration of restrictions, title transfer, etc.)
- Baseline information – description of ecological characteristics of the proposed mitigation bank site
- Description of number of credits to be provided
- Mitigation work plan – detailed written specification and work descriptions for the mitigation bank site
- Maintenance plan – description and schedule of maintenance requirements
- Performance Standards – ecologically-based standards used to determine whether the project is achieving its objectives
- Monitoring requirements
- Long-term management plan – description of mitigation site management after meeting all performance standards to ensure long-term sustainability of the site
- Adaptive management plan – a management strategy to address unforeseen changes in site conditions or other aspects of the project. It guides decisions for addressing circumstances that adversely affect a mitigation project
- Financial assurances – a description of any financial assurances that will be provided to ensure that the mitigation project will be completed in accordance with its performance standards.
- A credit release schedule tied to achievement of specific milestones.

For an in-lieu fee program, a complete instrument must include the following information:

- Compensation planning framework (33 CFR 332.8(c)/40 CFR 230.98(c));
- Specification of the amount of advance credits (33 CFR 332.8(n)/40 CFR 230.98(n)) and the fee schedule for these credits;
- Methodology for determining future project-specific credits and fees;
- Description of the in-lieu fee program account (33 CFR 332.8(i)/40 CFR 230.98(i)).

Mitigation Plan (33 CFR 332.4(c)/40 CFR 230.92.4(c))

A mitigation plan is required for all forms of compensatory mitigation, whether permittee-responsible mitigation, mitigation banks, or in-lieu fee mitigation projects.

Preparation and Approval of Mitigation Plans

Permittee-Responsible Mitigation

Individual Permits

- The permittee must prepare a draft mitigation plan and submit it to the district engineer (DE) for review.
- Then the permittee must prepare a final mitigation plan, which must be approved by the DE prior to issuing the individual permit.
- The final mitigation plan must be incorporated into the individual permit by reference.
- The final plan must include the 12 components listed below.
- The level of detail of the plan should be commensurate with the impacts.
- The DE may determine that it would be more appropriate to address any of the 12 components listed below as permit conditions, instead of components of a mitigation plan.

General Permits

- The DE may approve a conceptual or detailed mitigation plan.
- A final mitigation plan incorporating the 12 components listed below, at a level of detail commensurate with the impacts, must be approved by the DE before the permittee commences work in waters of the U.S.
- The DE may determine that it would be more appropriate to address any of the 12 components listed below as permit conditions, instead of components of a mitigation plan.

Using Mitigation Banks or In-Lieu Fee Programs

Individual Permits

For permittees meeting their mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, their mitigation plans only need to include components 4 (baseline information) and 5 (determination of credits), and the name of the mitigation bank or in-lieu fee program to be used.

General Permits

For permittees meeting their mitigation obligations by securing credits from approved mitigation banks or in-lieu fee programs, their mitigation plans only need to include components 4 (baseline information) and 5 (determination of credits) and either the name of the mitigation bank or in-lieu fee program to be used or a statement indicating that a mitigation bank or in-lieu fee program will be used (contingent upon approval by the DE).

Mitigation banks and in-lieu fee programs must prepare a mitigation plan including the 12 components listed below for each mitigation project site.

12 Components of a Compensatory Mitigation Plan

1. Objectives. A description of the resource type(s) and amount(s) that will be provided, the method of compensation (restoration, establishment, preservation etc.), and how the anticipated functions of the mitigation project will address watershed needs.

2. Site selection. A description of the factors considered during the site selection process. This should include consideration of watershed needs, onsite alternatives where applicable, and practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the mitigation project site.

3. Site protection instrument. A description of the legal arrangements and instrument including site ownership, which will be used to ensure the long-term protection of the mitigation project site.

4. Baseline information. A description of the ecological characteristics of the proposed mitigation project site, in the case of an application for a DA permit, the impact site. This may include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s), and other characteristics appropriate to the type of resource proposed as compensation. The baseline information should include a delineation of waters of the United States on the proposed mitigation project site. A prospective permittee planning to secure credits from an approved mitigation bank or in-lieu fee program only needs to provide baseline information about the impact site.

5. Determination of credits. A description of the number of credits to be provided including a brief explanation of the rationale for this determination.
    - For permittee-responsible mitigation, this should include an explanation of how the mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity.
    - For permittees intending to secure credits from an approved mitigation bank or in-lieu fee program, it should include the number and resource type of credits to be secured and how these were determined.

6. Mitigation work plan. Detailed written specifications and work descriptions for the mitigation project, including: the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water; methods for establishing the desired plant community; plans to control invasive plant species; proposed grading plan; soil management; and erosion control measures. For stream mitigation projects, the mitigation work plan may also include other relevant information, such as planform geometry, channel form (e.g., typical channel cross-sections), watershed size, design discharge, and riparian area plantings.

7. Maintenance plan. A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.

8. Performance standards. Ecologically-based standards that will be used to determine whether the

mitigation project is achieving its objectives.

9. Monitoring requirements. A description of parameters monitored to determine whether the mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting monitoring results to the DE must be included.

10. Long-term management plan. A description of how the mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.

11. Adaptive management plan. A management strategy to address unforeseen changes in site conditions or other components of the mitigation project, including the party or parties responsible for implementing adaptive management measures.

12. Financial assurances. A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the mitigation project will be successfully completed, in accordance with its performance standards.

Other information. The DE may require additional information as necessary to determine the appropriateness, feasibility, and practicability of the mitigation project.

Appendix C: MDE Nontidal Wetland Compensation Fund Fee Structure

May 15, 1991

(per acre of mitigation required)

Category A Counties

County Name	Design, Construction, and Monitoring Costs	Land Acquisition Costs	Total Cost (per acre)
Caroline	$10,000	$1,500	$11,500
Dorchester	$10,000	$1,650	$11,650
Kent	$10,000	$3,050	$13,050
Queen Anne's	$10,000	$4,150	$14,150
Somerset	$10,000	$1,100	$11,100
Talbot	$10,000	$5,750	$15,750
Wicomico	$10,000	$1,600	$11,600
Worcester	$10,000	$2,800	$12,800

Category B Counties

County Name	Design, Construction, and Monitoring Costs	Land Acquisition Costs	Total Cost (per acre)
Allegany	$50,000	$800	$50,800
Anne Arundel	$50,000	$6,700	$56,700
Baltimore	$50,000	$6,400	$56,400
Calvert	$50,000	$5,750	$55,750
Carroll	$50,000	$2,700	$52,700
Cecil	$50,000	$3,250	$53,250
Charles	$50,000	$1,800	$51,800
Frederick	$50,000	$2,800	$52,800
Garrett	$50,000	$1,025	$51,025
Harford	$50,000	$3,250	$53,250
Howard	$50,000	$8,000	$58,000
Montgomery	$50,000	$6,000	$56,000
Prince George's	$50,000	$5,000	$55,000
St Mary's	$50,000	$1,400	$51,400
Washington	$50,000	$2,750	$52,750

Appendix D: Instructions for MDE Nontidal Wetland Compensation Fund Payments

Complete a Nontidal Wetland Compensation Fund Waiver Form

Enclose a check made payable to: Maryland Department of the Environment

In the line on the check labeled "for" write "Nontidal Wetland Compensation Fund" and include the permit number.

Date

Bank Name

Permittee Name
Address

Pay to the order of Maryland Department of the Environment $_____

_____Dollars

_____

For: Nontidal Wetland Compensation Fund Signature

Permit # 200xxxxxxx/xx-NT-xxxx

Make 2 copies of this entire Document and the Check.
Keep one copy for your records.

Mail the original Document and the Check to:

MARYLAND DEPARTMENT OF THE ENVIRONMENT
NONTIDAL WETLAND COMPENSATION FUND
FISCAL SERVICES DIVISION
P. O. BOX 2057
BALTIMORE, MD 21203-2057

Mail the second copies of the Document and the Check to:

MR. JOSHUA TIRALLA
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
MONTGOMERY PARK BUSINESS CENTER
1800 WASHINGTON BLVD. – SUITE 430
BALTIMORE, MD 21230

NONTIDAL WETLAND COMPENSATION FUND
WAIVER FORM

I, _____, having an address at _____ _____ hereby acknowledge and agree to the following:

1. I have applied to the Maryland Department of the Environment, Water Management Administration, Nontidal Wetlands and Waterways Division (WMA) for a permit to conduct a regulated activity in a nontidal wetland within the State of Maryland.

2. I understand that the Nontidal Wetlands Protection Act, DE . 5-909 establishes the Nontidal Wetland Compensation Fund ("the Fund") within WMA to accept monetary compensation in lieu of mitigation, where it has been determined that wetland creation, restoration or enhancement are not feasible.

3. I understand that WMA has determined that mitigation is not feasible for the regulated activities I intend to conduct and that I may contribute money into the Fund instead of mitigating for the loss of _____square feet of _____ nontidal wetlands permitted under authorization number _____.

4. I have received and read the attached copy of the "Nontidal Wetland Compensation Fund Fee Structure" dated May 15, 1991 (Rev. 10/22/92). I understand that the Fee Structure sets forth the fees that WMA uses to determine the amount of monetary compensation I will contribute into the Fund per acre of mitigation required.

5. I have been informed by WMA and understand that the Fee Structure has not yet been officially adopted by WMA or the Maryland Department of the Environment ("the Department"). I understand that this means that the Fee Structure has not yet been made available for public comment and that the legal requirements that the Department must follow to adopt the Fee Structure as a Departmental regulation have not yet been met. Further, I understand that the Fee Structure may change as the Department goes through the legal process of adopting it as a regulation.

6. With full knowledge that future regulations may change the present Fee Structure, I agree to be bound by the present Fee Structure, which shall be the only Fee Structure applicable to me for authorization number _____, and I hereby waive any and all rights I may have to challenge its use or application. I understand that by waiving my right to challenge the present Fee Structure I am giving up any right I may have to contest the Department's use of the present Fee Structure in determining the amount of my contribution into the Fund.

7. I have entered into this Waiver voluntarily and intentionally with full knowledge that I may be surrendering the right to contest the validity of the Fee Structure or its application to me.

8. I am a duly authorized representative of _____ with full authority to waive or surrender legal or other rights held by_____.

AGREED AND ACCEPTED this _____ day of _____, 200_

WITNESS:_____ _____
Name of Permittee

IF CORPORATION:

WITNESS:_____ By:_____
Name & Title

Appendix E: Phase I Mitigation Plan - Required Information

MITIGATION is the replacement of wetland acreage, functions and human values that were or will be lost, due to filling, excavation, changes to hydrologic regimes or any other activity that may degrade or destroy an existing wetland. Mitigation can be achieved through:

Creation -Establishing wetlands on an upland site (e.g., grading an existing upland agricultural field so that the topsoil is saturated for a sufficient duration to support wetland plants)

Restoration -Establishing wetlands on former wetland sites (e.g., excavating a previously filled nontidal wetland to restore wetland functions or removing drainage improvements)

Enhancement -Providing additional protection to, or improving the functions of, a nontidal wetland (e.g., discontinuing farming practices on a farmed nontidal wetland)

Since all information requested must be provided as part of a permit application in order for the application to be considered complete, it is in an applicant's best interest that the information is filled out correctly and completely. It is advisable for the applicant to secure the services of a competent environmental consultant in order to help formulate their mitigation plan. A list of environmental consulting firms is available from our office.

PHASE I MITIGATION PLAN Requirements:

1. A written description of the type and acreage of the proposed nontidal wetland loss, including the types of wetland plant communities and the associated dominant species in the existing wetland, the amount (in square feet) of wetlands that will be lost due to the permitted activity, and the functions that the existing wetland presently provides.

Wetlands provide many functions, including fish and wildlife habitat, habitat for rare, threatened and endangered species, water quality improvement, erosion control, stormwater/flood control, timber production, and recreational opportunities. Applicants may use their best judgment in determining the functions of a particular nontidal wetland. However, it may be in their best interest to employ the services of knowledgeable environmental consulting firm to make these determinations.

2. A location map and description of the proposed wetland mitigation project(s) and how they will replace proposed nontidal wetland losses in acreage and function.

Replacement ratios are expressed as a relationship between two numbers. The first number specifies the acreage of wetlands to be mitigated and the second number specifies the acreage of wetlands lost. The standard replacement ratios are 2:1 for forested and scrub/shrub wetlands and 1:1 for emergent wetlands, with higher ratios for impacts to nontidal wetlands of special State

concern.

The Department may authorize alternative forms of mitigation or payment to the Nontidal Wetlands Compensation Fund when strict adherence to the replacement ratios is not possible or when in-kind replacement is not technically feasible.

3. A description of the mitigation site selection process and a justification for the selection of the proposed mitigation site. Describe how the proposed mitigation is consistent with goals and recommendations for the watershed, as listed in MDE's Priority Areas for Wetland Restoration, Preservation, and Mitigation. The document and maps are available on MDE's website. When feasible, mitigation projects should be located on the same site that the wetlands impact(s) occurred. If mitigation on site is not feasible, then the mitigation project should take place as close to where the nontidal wetland impact occurred as possible, in the same watershed.

Mitigation projects located at a single site are preferred over those that are scattered over multiple sites.

A. Lands preferred for mitigation may have one or more of the following physical characteristics:
Disturbed areas, areas in agricultural production, former wetland areas that may now be degraded, areas adjacent or connected to existing nontidal wetlands, waterways or within the 100-year floodplain, and that are accessible to necessary construction equipment.

B. Areas that are not acceptable for wetland mitigation are forested uplands, dredge disposal sites (excluding those for beneficial use); and areas identified as important habitat for rare, threatened and endangered plants or wildlife, unless the mitigation project would enhance the habitat.

4. A draft copy of the selected protection mechanism(s) to be used for each mitigation site. Approved methods of protection include conservation easements, deed restrictions, restrictive covenants, or deeding the land to an organization or public agency. The selected protection mechanism must be approved by the Department prior to actual implementation. Documentation that the selected protection mechanism has been executed must be submitted to the Department within 60 days of the completion of construction of the mitigation project.

5. Additional information that must be considered:

- Does the proposed mitigation site contain any Rare Threatened and Endangered species?
- Does the proposed mitigation site contain any Maryland Historical Trust concerns?
- Will the proposed mitigation site impact waterways or floodplains? If so, you will have to get authorization to impact these resources.
- Has the applicant secured a bond or other financial assurance PRIOR to permit issuance?

- Does the applicant have the legal right to construct the mitigation project on the property?

When all required information is received by the Nontidal Wetlands Division, a decision concerning the acceptability of Phase I of the mitigation plan will be part of the final permit decision. The Division will also provide guidance to the applicant regarding the contents, timing and necessity of proceeding with Phase II of the mitigation plan.

Certain information, such as hydrologic data from test wells, may be needed for Phase II of the mitigation plan and must be collected over an extended period of time. Therefore, it benefits the applicant to begin collecting relevant information regarding the proposed mitigation site at the earliest possible opportunity.

Appendix F: Phase II Mitigation Plan – Required Information

Plan view scaled drawings, including:

- ☐ A vicinity map showing the mitigation project location, existing land use and zoning
- ☐ The location, type, and acreage of proposed nontidal wetland mitigation activities
- ☐ The proposed location of stockpile areas
- ☐ The location of sediment and erosion control practices
- ☐ The locations of all areas used to store machinery, equipment or supplies
- ☐ The proposed source of borrow materials
- ☐ The proposed location, spacing, and type of propagules for each plant species
- ☐ A cross-section drawing showing existing and proposed final site conditions, including grade, elevation and slope.
- ☐ A construction schedule that includes estimated start and completion dates. Silt fence must be completely removed after construction has been completed. Contact an MDE Compliance Inspector for confirmation that the site is stabilized.

Hydrology:

- ☐ Estimated elevation of surface and/or ground water as measured from the soil surface bimonthly, March through May, and monthly, June through October
- ☐ The source of the water such as ground water, precipitation, and surface water, over various seasons of the year, and any relevant precipitation data

Soils/substrate:

- ☐ A description of existing and planned soil and substrate conditions. Existing soil should be verified in the field. Soil borings may also be required by the Department.
- ☐ Topsoil should be salvaged and replaced whenever possible to a depth of at least 6 inches. Site should be graded to below 6 inches of final grade, then 6 inches topsoil spread over site.
- ☐ Soil and substrate amendments needed to meet hydric soil characteristics and maintain the specified plant species. * <u>A minimum of 60 cubic yards of organic matter per acre is required</u>. The addition of supplemental large woody debris may also be recommended.
- ☐ The surface of the soil must not be compacted to the extent that it limits plant establishment and microbial activity. Upon completion of initial grading, the soil must be disked or chisel plowed to a depth of at least 8 inches.

Planting:

- ☐ The scientific and common names of plant species to be used. All species planted within the wetland and wetland buffer shall be native to that region of the State. All species used for temporary or permanent seeding must be native or non-persistent.
- ☐ With the exception of temporary stabilization species, all species planted in the wetland should have an Indicator Status of Obligate, Facultative Wet, or Facultative. No more than 50% shall be facultative.

☐ Planting dates for each species and fertilizer requirements for the entire 5-year monitoring period

☐ The method to be used for plant protection from herbivory by deer, rabbits, etc. (including fencing, tubing or other protection).

Monitoring:

☐ A 5-year monitoring schedule establishing responsibility for the removal of exotic and nuisance vegetation, and permanent establishment of the nontidal wetland and its component parts. Monitoring shall be conducted according to MDE's Monitoring Protocol (copy attached). If tree protection tubes or tree stakes are used, they must be removed prior to monitoring termination.

☐ The person/consultant responsible for preparing and submitting the annual monitoring reports. This will require an agreement with a consultant or other qualified person in advance.

Other considerations:

☐ The type of physical protective barrier to be used to reduce human encroachment (e.g. mowing, dumping) including signs, fences, etc.

☐ Best Management Practices for working in nontidal wetlands, wetland buffers, waterways, and 100-year floodplains should be included on plans

☐ The type of surety bond or other security that shall be payable to the State and conditioned upon the successful completion of construction of the mitigation project according to an approved mitigation plan

☐ A detailed description of the site protection mechanism to be used. (Approved methods of protection include conservation easements, deed restrictions, restrictive covenants, or deeding the land to an organization or public agency). Documentation that the selected protection mechanism has been executed must be submitted to the Department within 60 days of the completion of construction of the mitigation project.

☐ Evidence of a legal right to implement the proposed mitigation plan on the selected site(s). (Acceptable methods of securing legal right to undertake the mitigation project include recorded deeds, executed conservation easements, a landowner agreements, or contracts of sale for the selected site.)

All of the requested information listed above should be submitted to:

Maryland Department of the Environment
Wetlands and Waterways Program
Mitigation and Technical Assistance Section
1800 Washington Boulevard, Suite 430
Baltimore, Maryland 21230

The Department will render a decision concerning the acceptability of Phase II of the mitigation plan within 45 days of receipt of a completed plan, unless a final permit decision has not been

made. If the Department fails to notify the applicant within the 45-day period, the plan shall be considered acceptable unless a final permit decision has not been made.

Appendix G: Best Management Practices for Working in Nontidal Wetlands, Wetland Buffers, Waterways, and 100-Year Floodplains

1) No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2) Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3) Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
4) Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5) Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6) Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7) All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Uniola sp.), and/or Rye (Secale cereale). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. **Kentucky 31 fescue shall not be utilized in wetland or buffer areas.** The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8) After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9) To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:

    Use I waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
    Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year.
    Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.

10) Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11) Culverts shall be constructed and any riprap placed so as not to obstruct the movement of

aquatic species, unless the purpose of the activity is to impound water.

Appendix H: Monitoring Protocol for Wetland Mitigation Projects

Maryland Department of the Environment
Water Management Administration
1800 Washington Boulevard
Baltimore, Maryland 21230
Revised: February 7, 2011

MONITORING PROTOCOL FOR WETLAND MITIGATION PROJECTS

A. Compensatory mitigation projects required as a condition of a State Nontidal Wetlands and Waterways Permit for wetland impacts should achieve the goals and objectives established in the approved Phase II Mitigation Plan. Within the five year monitoring period, or other time period as required by the Department in the Phase II Approval Letter, it shall be demonstrated that the mitigation site has become a nontidal wetland. Additionally, mitigation projects shall conform to the following criteria by the end of the five year monitoring period, unless otherwise agreed to by the regulatory agencies.

1) Greater than 85% of the wetland mitigation site shall be vegetated (either by planted or naturally revegetated plants) by native wetland species similar to those found in the nontidal wetland lost or by a species composition acceptable to the Nontidal Wetlands and Waterways Division. Vegetative communities not acceptable to the Division would include those communities dominated by common reed (*Phragmites australis*) or other nuisance vegetation, or communities which are dominated by facultative upland or upland species.
2) The entire wetland restoration or creation area must have wetland hydrology, defined as 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability). For the purpose of this determination, the growing season is based on two indicators of biological activity that are readily observable in the field: (1) above ground growth and development of vascular plants and (2) soil temperature as an indicator of soil microbial activity. These indicators of biological activity shall be used for determinations of growing season (as related to the hydrological indicator) and are more fully described in the appropriate regional supplement to the Corps of Engineers Wetland Delineation Manual.
3) The wetland restoration or creation area must have active hydric soil conditions, as demonstrated by saturated and anaerobic soils.
4) The site shall provide the functional goals and objectives established in the approved Phase II mitigation plan approval letter.

B. An as-built design plan shall be submitted to the Mitigation and Technical Assistance Section of the Nontidal Wetlands and Waterways Program within 120 days of the completion (this includes grading, planting and/or vegetative stabilization) of the mitigation project. If the project was built as planned, a notification stating that can substitute for the “as-built” plan.

C. The permittee will be responsible for submitting annual monitoring reports to the Nontidal Wetlands and Waterways Division for a period of five consecutive years from the completion of the

construction of the mitigation site. If the U.S. Army Corps of Engineers requires a longer monitoring period, reports sent to them should also be sent to the Nontidal Wetlands and Waterways Division. In the case of longer monitoring periods, monitoring reports may not be required every year, but will be determined by the Corps and MDE. Annual monitoring reports must be submitted to MDE by December 31 of each monitoring year. The first monitoring report is due the year the mitigation planting occurs, unless planting occurs after April 15, in which case the first monitoring report will not be due until the end of the next year. For each monitoring report, at least one monitoring visit should be conducted during the growing season for the vegetative monitoring (between May 1 and September 31 for forested/scrub-shrub systems and between June 15 and September 31 for emergent systems). These site visits should preferably be during a period with normal precipitation and groundwater levels. The following information should be included with the annual monitoring report:

1) Overview / Background Data:

   (a) Dates of site inspections.

   (b) A brief paragraph describing the purpose of the approved project, acreage and type of aquatic resources impacted, and mitigation acreage and type of aquatic resources authorized to compensate for the aquatic impacts. Include the dates the mitigation construction was started and the planting was completed.

   (c) A narrative description of the mitigation site addressing its position in the landscape, adjacent waterbodies, and adjacent land use.

   (d) A narrative description of existing site conditions and how the mitigation site has achieved the goals, objectives and performance standards established for the project.

   (e) Take one set of photographs from established photographic points any time during May through September of each monitoring year (pictures should be taken at the same time of year when possible). Photo location points should be identified on the appropriate maps and labeled with the direction in which the photo was taken.

   (f) Estimate the percent of the mitigation site that is establishing into wetland and the type of wetland system (ex: forested, scrub-shrub, emergent). If this differs from what was planned, show the boundaries of the actual wetland area/types on the plans or maps.

2) Vegetation:

   (a) For each monitoring year, estimate the percent cover by dominant plant species (including volunteer plants) and any invasive plant species. Estimate percent cover by plants with a wetland indicator status of FAC or wetter. Estimate the percent survival of woody planted material and number of native trees/shrubs per acre (including volunteer woody species taller than ten inches).

   (b) Measurements of vegetation based upon performance standard criteria and methods used to assess the vegetative success of the mitigation site.

(c) For years when vegetative plots are assessed, summarize the results from the vegetation plot study, including the density and/or percent cover of wetland species present in order of dominance and for each vegetative stratum. **Do not include the raw plot data in your monitoring report.**

3) Hydrology:

(a) Estimate percent of site that is inundated or saturated to the surface on the dates of the site visits.

(b) Monitoring data for surface water and groundwater, including hydrograph of measured depth to water table, after calibrating for above-ground height of well.

4) Soils:

(a) Monitoring data to determine if hydric soils are actively developing. This may include evidence that saturated and anaerobic soil conditions are being met.

5) Remediation:

(a) Describe any problems observed within the mitigation site, such as: excessive inundation, insufficient hydrology, seasonal drought conditions, invasion by undesirable species of plants or wildlife, disease condition for plants, poor plant establishment, adverse water quality impacts (i.e., excessive sediment loading, water pollution, etc.), human encroachment, and slope failures or erosion problems.

(b) Describe the proposed remedial measures to address the problems noted above.

D. Remedial measures proposed by the permittee are subject to review and approval by the regulatory agencies prior to implementation. In the event that remedial measures are implemented, the monitoring period may be extended on a case-by-case basis, but will not be extended for more than a three-year period. The treatment of non-native invasive plant species does not need the approval of the MDE Wetlands and Waterways Division, but should be completed at the correct time of year by someone with a current pesticide applicator certification and the required toxic materials permit.

<u>Recommended Vegetation Density Measurement Technique</u>

a. The following method for measuring the success of the vegetative colonization should be conducted once between May and September of the second, third, and fifth growing seasons subsequent to the completion of the construction of the mitigation project, unless an alternate schedule is agreed upon by MDE.
b. Vegetation sample plots shall be located on a stratified random basis over the site in order to sample all areas of restored/constructed wetlands at locations adjacent to each photo location marker. The following minimum numbers of samples will be required:
    i. If the site is < 5 acres, then a minimum of 3 plots/acre is necessary.
    ii. If the site is > 5 acres but less than 20 acres, then a minimum of 3 plots/acre is required for the first 5 acres, then 2 plots/acre is required for the remaining acreage.
    iii. If the site is > 20 acres, then a minimum of 2 plots/acre is required for the first 20 acres, then 1

plot/acre is required for the remaining acreage.

iv. All cells, fields, or blocks shall be sampled. A targeted vegetation monitoring approach that correlates monitoring stations with vegetative signatures on aerial photography may be useful for larger mitigation sites.

c. Each plot shall be of a size no less than 400 square feet for woody plants and 3'x3' for herbaceous plants (or circular with approximately the same surface area). The vegetation data shall be collected during the growing season and shall include:
   i. Dominant vegetation species identification
   ii. Percent ground cover assessment
   iii. Number of woody plant stems greater than 10 inches in height (total and #/acre)
   iv. The percentage of dominant species FAC or wetter
   v. Percent survival by planted species
   vi. An invasive/noxious species assessment including percent cover

<u>Recommended Groundwater Well Placement and Data Collection</u>

a. Determine if this wetland is groundwater fed or has a perched water table. Soil profile descriptions must be assessed prior to well installation to identify any restrictive layers to downward water movement. Wells should be installed so they do not penetrate the restrictive layer, but are instead no deeper than the top of the restrictive layer (as discussed in the 2005 Corps document entitled *Technical Standard for Water-Table Monitoring of Potential Wetland Sites ERDC TN-WRAP-05-02*). In most cases, a standard monitoring well installed to 15 inches below the soil surface should be used. Shallower installation depths should be utilized if restrictive soil depths are located within 15 inches of the soil surface. The permittee's plan for well design and installation shall be consistent with current Corps guidance.

b. The following minimum numbers of groundwater wells will be required:
   i. If the site is < 10 acres, then a minimum of 1 well/acre is necessary.
   ii. If the site is 10 to 20 acres, then a minimum of 1 well/acre is necessary for the first 10 acres, then 1 well/2 acres is necessary for the remaining acreage.
   iii. If the site is > 20 acres, then a minimum of 1 well/acre is necessary for the first 10 acres,1 well/2 acres is necessary for the next 10 acres, and 1 well/5 acres is necessary for the remaining acreage.

   iv. Hydrologic zones differentiated by a 1-foot change in elevation should have a minimum of one groundwater monitoring well installed.
   v. For sites with multiple cells, each cell should have at least one well.

c. Begin the collection of groundwater well data within fourteen days of the start of the growing season and continue for at least the first two (full) growing seasons subsequent to the completion of grading. The growing season (as further detailed in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual) has begun on a site in a given year when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas begin to exhibit visible aboveground growth or soil temperature measured at the 12 inch depth is 41°F (5°C) or higher. The approximate growing seasons within Maryland (these are regional averages; the growing season may be shorter or longer depending upon location and weather) are as follows:
   i. East of Washington County - April 1 through October 31
   ii. West of and including Washington County - April 30 through September 30

d. Take groundwater well readings once every 7 days for the first two months of the growing season and every 30 days for the remainder of the growing season. Record to the nearest inch (refer to Data Sheet

#4).

e. Measure and record any surface water present at the monitoring wells.

f. Include a copy of the plan showing the location of the wells and surface elevation beside each well. Summarize the information regarding groundwater and surface water elevations, and, if relevant, provide monthly rainfall data for the areas.

Recommended Indicator of Saturated and Anaerobic Conditions to Demonstrate the Presence of Active Hydric Soil Conditions

a. Follow the directions outlined in the Hydric Soil Technical Standard (Technical Note 11) developed by the National Technical Committee for Hydric Soils (http://soils.usda.gov/use/hydric/ntchs/tech_notes/index.html) for recommended methods to demonstrate the presence of anaerobic conditions. These methods include a positive reaction to alpha-alpha Dipyridyl, reduction of iron determined with IRIS tubes, and the measurement of redox potential (Eh) using platinum electrodes. Note that alpha-alpha Dipyridyl is also available as paper strips for easier measurement.
b. Include a copy of the plan showing the location of the data collection, summarize the information, and, if relevant, provide monthly rainfall data for the areas.

Recommended Indicator of Reduction in Soils (IRIS) Tube Placement and Data Collection (summarized from the 2008 document entitled *Protocol for Using and Interpreting IRIS Tubes*).

a. IRIS Tubes should be installed during the time of the growing season anticipated to have the highest amount of soil reduction (often in the early growing season). They should be installed in a representative portion of the mitigation site, rather than in the lowest/wettest areas. Additional IRIS tube samples should be taken for larger sites and sites with higher changes in elevation.
b. Create a pilot hole in the soil using a 7/8" push probe.
c. Be sure tubes are labeled.
d. Insert the IRIS tube into the hole until the mark on the tube is at the soil surface (50 cm). If they are installed to shallower depths, mark the depth of the soil surface with a permanent marker.
e. Install five replicates, up to a meter apart, within the study area.
f. Tubes should be left in place for two to four weeks. Then should be removed and replacement tubes can be installed in the same holes for an additional two to four weeks.
g. Gently wash off any adhering soil from the tubes.
h. Estimate the amount of paint removed from each tube.
i. To improve accuracy, have two people estimate the amount of paint removed, then average the two sets of data.
j. Find a six inch area on the tube, entirely within the upper 12 inches, with the most paint removed. Estimate the percentage of paint removed from this six inch area.
k. To meet the Technical Standard for reducing soil conditions as currently specified in the National Technical Committee on Hydric Soils, 30% or more of paint within this six inch section must be removed.
l. At least three of the five replicates must show this paint removal for the soil to demonstrate that it is reducing.
m. Include a copy of the plan showing the location of the IRIS tubes, summarize the information, and, if

relevant, provide monthly rainfall data for the areas.

Appendix I: Declaration of Restrictive Covenants

THIS DECLARATION OF RESTRICTIVE COVENANTS (this "Declaration") is made this ___ day of _____, 20__, by _____ ("Owner") having an address at

INTRODUCTORY STATEMENT

A. Owner is the fee simple owner of that certain real property located in the _____ Election District of _____ County, Maryland consisting of approximately ___ acres more particularly described in a Deed dated _____, and recorded among the land records of County, Maryland at Liber ___, Folio ___ ("Property").

B. Owner proposes to create a _____nontidal wetland, approximately ___acres in size at the location shown on Attachment A, ("Survey"), attached hereto and hereby made a part hereof ("Mitigation Site").

C. Owner desires to record this Declaration among the Land Records of _____ County to ensure that certain activities not be conducted within the Mitigation Site.

NOW THEREFORE, in consideration of the covenants, terms, conditions and restrictions hereinafter set forth, Owner declares as follows:

1. As of the date hereof, the Mitigation Site shall be deemed jurisdictional nontidal wetlands. Owner, his personal representatives, heirs, successors and assigns shall not undertake on its own, or grant permission to others, to conduct any of the following regulated activities within the Mitigation Site or a 25 foot buffer measured outward from the perimeter of the Mitigation Site:

A. Removal, excavation, or dredging of soil, sand, gravel, minerals, organic matter, or materials of any kind;

B. Changing existing drainage characteristics, sedimentation patterns, flow patterns, or flood retention characteristics;

C. Disturbance of water level or water table by drainage, impoundment or other means;

D. Dumping, discharging of material or filling with material, including the driving of piles, and placing of obstructions;

E. Grading or removal of material that would alter existing topography;

F. Destruction or removal of plant life that would alter the character of the nontidal wetland, except for the removal of invasive species as determined by the Maryland Department of the Environment;

G. Agricultural activities shall not be conducted within the Mitigation Site or within a 25 foot wide buffer measured from the outside perimeter of the Mitigation Site. For purposes of this Declaration, the term "agricultural activities" means aquaculture and farming activities including plowing, tillage, cropping, seeding, cultivating, the grazing and raising of livestock, sod production and harvesting for production of food and fiber products. Forestry activities may not be conducted within the Mitigation Site. "Forestry activities" means planting, cultivating, thinning, harvesting or any other activity undertaken to use forest resources or to improve their quality or productivity; except for:

H. Maintenance and repair activities authorized by the Department of the Environment and the Army Corps of Engineers that are necessary for the site to function as designed.

2. Owner, his personal representatives, heirs, successors and assigns shall include reference to this Declaration and the restrictions contained herein in every deed, or other legal instrument by which any interest in the Property is conveyed. The provisions of this Declaration shall be deemed to be covenants running with and binding upon the Property in perpetuity.

IN WITNESS WHEREOF, Owner has hereunto set his hand and seal the day and year first above written.

_____(SEAL)
Owner

STATE OF MARYLAND, County of _____, TO WIT:

I HEREBY CERTIFY, that on this ____ day of _____, 200 , before me the subscriber, a Notary Public of the State aforesaid, personally appeared known to me, or satisfactorily proven to be, the Owner under the foregoing Declaration and acknowledged that he executed the same for the purposes therein contained and in my presence signed and sealed the same.

WITNESS my hand and Notarial Seal.

_____
Notary Public
My Commission Expires:_____

Appendix J: Nontidal Wetland Consultant List

This list is for informational purposes only. It is not a complete list of all providers that may offer wetland related professional services. It is available as a convenience to the public. The Department in no way recommends or guarantees the accuracy or quality of services performed by the providers listed.

Each provider listed is coded only for the wetland-related services they offer. The codes are assigned based on information furnished by the provider. If difficulties were encountered in determining what services were offered, then no code was assigned. Users of this list should always contact providers directly for a full and complete explanation of services offered. The codes are:

A: Wetland Delineation
B: Functional Analysis
C: Mitigation Design
D: Mitigation Construction
E: Regulatory and Permit Coordination
F: General Landscape Services in Wetlands

Additions/revisions to the list will be processed upon receipt of a written request and appropriate documentation. Requests should include a summary description, in one page or less, of the wetland related services offered in the areas of: wetland delineations; functional analysis (e.g., WET and HEP); mitigation; and regulatory and permit coordination. Send request to:

Nontidal Wetlands Division
Water Management Administration
1800 Washington Boulevard, Suite 430
Baltimore, Maryland 21230

Aarcher, Inc.
910 Commerce Road
Annapolis, MD 21401
410-897-9100
jcuster@aarcherinc.com

A.D. Marble & Company
10989 Red Run Blvd., Suite 209
Owings Mills, MD 21117
410-902-1421
A, B, C, E, F

AG Environmental Restoration, LLC
180 Dividing Court
Arnold, MD 21012
410-647-0809
anngleeson@comcast.net
A, C, E

American Land Concepts
238 B Main Street
Reisterstown, MD 21136
410-526-2688
A, B, C, E, F

Andrews, Miller & Associates, Inc.
401 Academy Street, Suite 1
Cambridge, MD 21613
410-228-7117
A, B. C, D, E, F

Angler Environmental
12811 Randolph Ridge Lane
Manassas, VA 20109
703-393-4844
http://www.AnglerEnvironmental.com
A, B, C, E

ATEC Environmental Consultants
8989 Hermann Drive
Columbia, MD 21045
410-381-0232
A, B, E

Ben Dyer Associates, Inc.
11721 Woodmore Road, Suite 200
Mitchellville, MD 20721
301-430-2000
A, B, C, E, F

Biohabitats, Inc.
15 W. Aylesbury Road
Towson, MD 21093
410-337-3659
A, B, C, D, E, F

Biota, Inc.
PO Box 178
Havre de Grace, MD 21078
410-575-7050
A, B, C, E, F

Bray Hill, LLC
10357 Whitewasher Way
Columbia, MD 21044
443-745-6133
brayhill@verizon.net
A, B, C, E, F

Brightwater, Inc.
6470 Dobbin Road – Suite F
Columbia, MD 21045
410-730-5411
A, B, C, E, F

BSA Land Res. Consult. Inc.
4464 Summit Bridge Road
Middletown, DE 19709
302-378-8125
A, F

Buchart Horn, Inc.
55 S. Richland Avenue
PO Box 15055
York, PA 17405-7055

717-843-5561
A, B, C, E

Bud Gorman, Inc.
309 Carolyn Street
Georgetown, DE 19947
302-856-6851
A, B, C, E

Cattail Consulting
PO Box 1599
Severna Park, MD 21146
410-544-0133
A

Charles P. Johnson & Associates, Inc (CPJ)
1751 Elton Road
Silver Spring, MD 20903
301-434-7000
A, C, E, F

Cherry Hill Construction, Inc.
8211 Washington Boulevard
Jessup, MD 20794
410-799-3577
D, E

Chesapeake Construction Service, Inc.
3868 Sykesville Road
Sykesville, MD 21784
410-795-0950
C, D

Chesapeake Environmental
1200 Conowingo Road
Bel Air, MD 21014
410-838-7617
A, E, F

Chesapeake Environmental Management
260 Gateway Drive, Suite 21-C
Bel Air, MD 21014
410-893-9016
A, B, C, E, F

Chester Environmental
818 W. Diamond Avenue
Gaithersburg, MD 20878
301-840-1030
A, B, C, E

Christopher Consultants, Ltd.
7172 Columbia Gateway Drive, Suite 100
Columbia, MD 21046
http://www.christopherconsultants.com
410-872-8690
A, B, C, E, F

CNA, Inc.
215 Bynum Road
Forest Hill, MD 21050
410-879-7200
A, B, C. E F

Coastal Environmental Services, Inc.
4201 Northview Drive, Suite 302
Bowie, MD 20718
301-464-5700
A, B, C, D, E, F

Coastal Resources, Inc.
2988 Solomon's Island Road
Edgewater, MD 21037
410-956-9000
A, B, C, E

CTL Engineering of West Virginia, Inc.
733 Fairmont Road
Morgantown, West Virginia 26501
304-292-1135
www.ctleng.com
A, C, E

Port Deposit, MD 21904
410-378-4011
A, B, C, E

D2 & Associates Consulting Engineers
3710 Damascus Road
Brookeville, MD 20833
301-774-5071
A, C, D

Daft, McCune & Walker, Inc.
200 E. Pennsylvania Avenue
Towson, MD 21286
410-296-3333
A, B, C, E

Dames and Moore
7101 Wisconsin Avenue
Bethesda, MD 20814
301-652-2215
A, B, C, D, E,

Development Facilitators, Inc.
504 Baltimore-Annapolis Boulevard
Severna Park, MD 21146
410-647-2727
A, C, E

D. H. Steffens Company
PO Box 1709
317 Charles Street
La Plata, MD 20646
301-934-2921
A, B, C, E

D. R. Sanders & Associates
302 Pecan Boulevard
Vicksburg, MS 39180
601-634-6061
A, B, C, E.

Duffield Associates, Inc.
20 Craigtown Road

EA Engineering
Science & Technology
15 Loveton Circle
Sparks, MD 21152
410-771-4950
A, B, C, E

Eastern Shore Environmental Consultants, Inc.
PO Box 195
Hebron, MD 21830
410-860-2040
A, E

EC Environmental Considerations
2701 Hillside Court
Ijamsville, MD 21754
301-865-3043
A, B

Eco-Science Professionals, Inc.
PO Box 5006
Glen Arm, MD 21057
410-832-2480
A, B, C, D, E, F

Eco-Science, Incorporated
PO Box 4294, Rural Route 4
Moscow, PA 18444
717-842-7631

Eco-Sense, Inc.
8354 Chestnut Farm Lane
Ellicott City, MD 21043
410-750-9925
A, C, E

Ecotone, Inc.

P.O. Box 5
1204 Baldwin Mill Road
Jarrettsville, MD 21084
410-692-7500
info@ecotoneinc.com
A, B, C, E, F

ECS Mid-Atlantic, LLC
14026 Thunderbolt Place
Suite 100
Chantilly, VA 20151
703-471-8400
www.ecs-midatlantic.com
A, B, C, E, F

Endesign
20815 Rock Hall Avenue
Rock Hall, MD 21661
410-639-7527
A, B, C, E, F

Engineering Group, Inc.
5526 Strawbridge Terrace
Sykesville, MD 21784
410-781-6510
F

Engineering Technologies Associates
3458 Ellicott Center Drive, Suite 101
Ellicott City, MD 21043
410-401-9920
A, C, D, E, F

ENSR, Inc.
9180 Rumsey Road, Suite D-3
Columbia, MD 21045
410-884-9280
A, B, C, E

ENSR, Inc.
155 Ottis Street
Northborough, MA 01532
508-393-6779
A, B, C, D, E

Environs, Inc.
PO Box 299
Freeland, MD 21053-0299
717-227-0073
A, B, C, D

Environmental Concern, Inc.
PO Box P
201 Boundary Lane
St. Michaels, MD 21663
410-745-9620
A, B, C, E

Environmental Consultants, Inc.
28712 Island Creek Road
PO Box 438
Trappe, MD 21673
410-476-5331
A, B, C, E

Environmental Consulting Services, Inc.
100 S. Cass Street
Middletown, DE 19709
302-378-9893
A, C, D, E

Environmental Quality Resources, Inc.
8711 Snouffer School Road
Gaithersburg, MD 20879
301-208-0123
D, F

Environmental Resources, Inc.
P.O. Box 169
38173 Dupont Highway
Selbyville, DE 19975
302-436-9637
thomas@ericonsultants.com
A, B, C, E

Environmental Resources, Management, Inc.

2666 Riva Road, Suite 200
Annapolis, MD 21401
410-266-0006
A, B, C, E

Environmental Sciences Corporation
14233 Jib Street, Suite 31
Laurel, MD 20707
703-765-6641
A, C, E

Environmental Science & Engineering, Inc.
5219 Militia Hill Road
Plymouth Meeting, PA 19462
215-941-9700
A, B, C, E

Environmental Science & Engineering, Inc.
250-A Exchange Place
Herndon, VA 22070
703-318-8900
A, B, C, E

Environmental Services, Inc.
9 St. Mary's Road
Pylesville, MD 21132
410-836-1974
A, B, C, E

Environmental Services, Inc.
45 Old Solomons Island Road, Suite 105
Annapolis, MD 21401
410-266-3828
A, C, E

Environmental Service of Gale J. Reed
25966 Foxgrape Road
PO Box F23
Greensboro, MD 21639
410-482-7027
A, B, E

Environmental Systems Analysis, Inc.
162 West Street
Annapolis, MD 21401
410-267-0495
www.esatoday.com
A, B, C, E, F

EnviroProjects, LLC
93 Eastway
Severna Park, MD 21146
410-599-5335
www.EnvironProj.com
A, B, C, E

Exploration Research, Inc.
6339 Howard Lane
Elkridge, MD 21075
410-567-5210
shuber@fshericom
A, B, C, D, E, F

Forest & Wetland Conservation Association
15716 Buena Vista Drive
Derwood, MD 20855
301-948-1686
A, B, C, D, E, F

Fox & Associates, Inc.
981 Mt. Aetna Road
Hagerstown, MD 21740
301-733-8503 or 293-7250
A, B, C, E

Frisch, M A
PO Box 879
Heathsville, VA 22473
1800-749-7699
A, B, C, E

FSI Design Group

10903 Indian Head Highway, Suite 400
Fort Washington, MD 20744
301-292-0200
A, C, E

FWA Environmental Science, Inc.
5 S. Main Street
Bel Air, MD 21014
410-879-2090
A, B, C, D

Gannett Fleming, Inc.
Village of Cross Keys, Suite 200-E
Baltimore, MD 21210
410-433-8832
A, B, C, D, E, F

General Construction, Inc.
PO Box 397
New Windsor, MD 21776
410-875-0659
A, B, E

Geo-Technology Associates, Inc.
3445-A Box Hill Corporate Center Drive
Abingdon, MD 21009
410-515-9446
A, B, C, E

Geo-Technology Associates, Inc.
14280 Park Center Drive, Suite A
Laurel, Maryland 20707
410-792-9446
301-470-4470
A, B, C, E

George E. Young, III, PC
1504 Market Street
Pocomoke, MD 21851
410-957-2149
A, C, E

Gerald A. Donovan Associates, Inc.
429 S. Governors Avenue
Dover, DE 19904
302-674-2903
A, B, E

Greenfields Group, The
307 Circle Avenue
Tacoma Park, MD 20912
301-270-4626
A, B, C, E, F

Greenhorne & O'Mara, Inc.
9001 Edmonston Road
Greenbelt, MD 20770
301-982-2800
A, B, C, E

Guido Piccinini & Sons
1810 Broadway Road
Lutherville, MD 21093
410-252-9041
C, F

G. W. Stephens, Jr. & Associates
658 Kenilworth Drive, Suite 100
Towson, MD 21204
410-825-8120
A, B, C. E

Haines Land Design
8921 Liberty Lane
Potomac, MD 20854
301-762-5040
A, B, C

Harris, Smariga & Associates, Inc.
41 E. All Saints Street
Frederick, MD 21701
301-662-4488
A, C, E

Helmstadt & Young, P. C.

1504 Market Street
Pocomoke, MD 21851
410-479-0400
A, C, E

Herbst & Associates
414 Main Street
Reisterstown, MD 21136
410-526-7200
A, C

Hickory Environmental Consulting LLC
212 East Main Street, Suite 210
Salisbury, Maryland 21801
410-860-8850
A, B, C, E

Highland Engineering & Survey, Inc.
309 S. 2nd Street
Oakland, MD 21550
301-334-6185
A, C, E

Human & Rhode, Inc.
512 Virginia Avenue
Towson, MD 21286
410-825-3883
A, B, C, E, F

The Idea Center, Ltd.
PO Box 1018
Middleburg, VA 22117
A, B

IPDS Limited
802 Sligo Avenue
Silver Spring, MD 20910
301-585-5676
A, C

Jack Mills Excavating
28261 Turner Road
Federalsburg, MD 21632
410-754-7671
jmeexcavating@aol.com
D

Jackson Lee Cook
30501 Prince William Street
Princess Anne, MD 21853
410-651-0365
410-651-0367
A, E

J. Finley Ransone & Associates
PO Box 10160
Towson, MD 21285
410-666-7448
A, B, C

John J. Gigliotti & Associates
942 Larch Way
Salisbury, MD 21801
410-546-4505
A, E, F

John E. Harms, Jr. & Associates
PO Box 5
Pasadena, MD 21122
410-647-6000
A, B, C

Johnson, Mirmiran & Thompson
72 Loveton Circle
Sparks, MD 21152
410-329-3100
A, C, E

Keilman Environmental Service, Inc.
PO Box 196-C
Ebensburg, PA 15931
814-472-8288
A, B, C, E

KCI Technologies, Inc.
10 N. Park Drive
Hunt Valley, MD 21030
410-316-7872
A, B, C, E

Kollar Environmental Services
5200 W. Heaps Road
Pylesville, MD 21132
410-836-0500
A, B, C, D, E, F

Lancy Environmental Services
181 Thornhill Road
Warrendale, PA 15085
412-772-0044
A, C

Lane Engineering, Inc.
15 Washington Street
Cambridge, MD 21613
410-221-0818
A, C, D, E, F

Lane Engineering, Inc.
117 Bay Street
P.O. Box 1767
Easton, MD 21601
410-822-8003
A, C, D, E, F

Lane Engineering, Inc.
114 West Water Street
Centerville, MD 21617
410-758-2095
A, C, D, E, F

Landscape Arch. Services
PO Box 293
Dover, DE 19903
302-284-4578
A, C

LDR International, Inc.
9175 Guilford Road
Columbia, MD 21046
410-792-4360
F

L. G. Wolff Associates, Inc.
10 W. Pennsylvania Avenue
Bel Air, MD 21014
410-836-0888
A, B, C, E

Living Ecosystems
350 N. Aurora Street, Suite 209
Easton, MD 21601
410-476-4580
A, B, C, E, F

Loiederman Soltesz Associates, Inc.
2 Research Place, Suite 100
Rockville, MD 20850
301-948-2750
www.LSAssociates.net
A, B, C, E

Lorenzi, Dodds & Gunnill
3475 Leonardtown Road, Suite 100
Waldorf, MD 20602
301-645-2254
A, B, C, E

L. Reed Huppman
16120 Dark Hollow Road
Upperco, MD 21155
410-239-8083
A, B, C, E, F

Kenneth E. McCabe
608 Stevenson Lane

Baltimore, MD 21204
410-321-8587
A, C

Keith Underwood & Assoc., Inc.
1753 Ebling Trail
Annapolis, MD 21401
410-849-3211
A, C, D, E, F

MAE - Mid Atlantic Environmental Consultants Inc.
1708 Westminster Way
Annapolis, MD 21401
www.maeconsultants.com
410-336-8691
443-822-9504
A, E

Marcris, Hendricks & Witmer
9220 Wightman Road, Suite 120
Gaithersburg, MD 20879
301-670-0840
A, B, C, E

McCarthy & Associates, Inc.
14458 Old Mill Road, Suite 201
Upper Marlboro, MD 20772
301-627-7505
A, B, C. D, E, F

McCrone, Inc.
20 Ridgely Avenue
Annapolis, MD 21401
410-267-8621
A, B, C, E

McCrone, Inc.
119 Naylor Mill Road, Suite 6
Easton, MD 21801

Mildenberg, Boender & Associates
5072 Dorsey Hall Drive
Ellicott City, MD 21042
301-621-5521
A, C, E

Nielsen, Inc.
697 208th Street
Pasadena, MD 21122
410-437-0970
A, B, C, E, F

Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110
603-472-5191
A, B, C. E

Parkton Woodland Services
17409 Evna Road
Parkton, MD 21120
410-357-5835
A, C

Parsons
10 East Baltimore Street, Suite 801
Baltimore, MD 21202
410-223-2740
A, B, C, E

Parsons
10521 Rosehaven Street, 2nd Floor
Fairfax, VA 22030
703-352-7192
703-385-1147
A, B, C, E

Peek/Smith, Inc.
406 W. Pennsylvania Avenue
Towson, MD 21204
410-296-0501
A, C, E

Penniman & Browne, Inc.
6252 Falls Road
Baltimore, MD 21209
410-825-4131
A

Plummer Bros. Construction Co.
42 Spring Creek Circle
Gettysburg, PA 17325
717-337-0082
A, C, D, E, F

Prairie Ridge Nursery
9738 Overland Road
Mt. Horeb, WI 53572
608-437-5245
C, F

Providence Center, Inc.
370 Shore Acres Road
Arnold, MD 21012
410-757-7800
F

Rauch, Walls & Lane, Inc.
408 N. Washington Street
Easton, MD 21601
410-822-8003
A, B, C, E

Redman/Johnston Associates, LTD
416 Goldsborough Street
Easton, MD 21601
410-822-9630
A, C, E, F

Rettew Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
717-394-3721
A, B, C, E, F

R. E. Wright Associates, Inc.
125 Airport Drive, Suite 36
Westminster, MD 21157
410-876-0280
A, B, C, E

R. E. Wright Associates, Inc.
3240 Schoolhouse Road
Middletown, PA 17057
717-944-5501
A, B, C, E

Richard C. Pais, Inc.
14222 Peddicord Road
Mt. Airy, MD 21771
301-829-3139
A, B, C, E, F

Riemer Muegge & Assoc., Inc.
8818 Centre Park Drive, Suite 200
Columbia, MD 21045
410-997-8900
A, B, C, E

RMC Environmental Services, Inc.
3450 Schuylkill Road
Spring City, PA 19475
215-948-4700
A, B, C, E

Roemer Ecological Services, Inc.
2334 Tracey's Store Road
Parkton, MD 21120-9640
410-357-9420
A, E

Rummel Klepper & Kahl
81 Mosher Street
Baltimore, MD 21217
410-728-2900
A, B, C, D, E

Schmid & Company, Inc.
1201 Cedar Grove Road
Media, PA 19063-1044
610-356-1416
www.schmidco.com
A, B, C, D, E

Schnable Engineering Association
10215 Fernwood Drive, Suite 250
Bethesda, MD 20817
301-564-9355
A, C, E

Schwarm Environmental Consulting
PO Box 236
Easton, MD 21601
410-822-1555
A, B, C, E

Skelly and Loy
449 Eisenhower Boulevard, Suite 300
Harrisburg, PA 17111
www.skellyloy.com
717-232-0593
A, B, C, E

Skelly and Loy, Inc.
19741-B Leitersburg Pike
Hagerstown, MD 21742
www.skellyloy.com
301-766-4236
A, B, C, E

Soil Consultants
9303 Center Street
Manassas, VA 20110
301-856-4806
A, B

Southern Tier Consulting, Inc.
PO Box 550
Portville, NY 14770
716-933-6189
C, E, F

Spencer Rowe, Inc.
12409 Kent Road
Ocean City, MD 21842
410-213-0127
A, C, E

Stokes Environmental Association, LTD
550 E. Main Street, Suite 408
Norfolk, VA 23510
804-623-0777
A, C, E

Straughan Environmental Services, Inc.
9135 Guilford Road, Suite 100
Columbia, MD 21046
301-362-9200
A, B, C, E

Sun General Contractors, Inc.
PO Box 104
Eden, MD 21822
410-543-2629
A, B, C, D, E, F

TAMS Consultants, Inc.
2101 Wilson Boulevard, Suite 300
Arlington, VA 22201
703-243-8000
A, B, E

Tetra Tech, Inc.
10045 Red Run Boulevard, Suite 110
Owings Mills, MD 21117

410-356-8993
A, B, C, E, F

Tetra Tech, Inc.
10306 Eaton Place, Suite 340
Fairfax, VA 22030
703-385-6000
A, B, C, E, F

Tetra Tech, Inc.
56 W. Main Street
Christiana, DE 19702
301-738-7551
A, B, C, E, F

Tidewater Environmental Assoc., Inc.
PO Box 3552
Salisbury, MD 21802
410-749-2045
A, B, C, E

TNT Builders
9538 Croppers Island Road
Newark, MD 21841
410-641-4076
A, B

Triad Engineering, Inc.
1075 D. Sherman Avenue
Hagerstown, MD 21740
301-797-6400
www.triadeng.com
A, B, C, E, F

URS Corporation
4 North Park Drive
Hunt Valley, MD 21030
410-785-7220
www.urscorp.com
A, B, C, D, E, F

Versar, Inc.
9200 Rumsey Road
Columbia, MD 21045-1934
410-964-9200
A, B, C, D, E

Walter Satterthwaite Associates
9418 Annapolis Road, Suite 206
Lanham, MD 20706
301-731-0580
A, B, C, D, E, F

WAPORA, Inc.
7926 Jones Branch Drive, Suite 1100
McLean, VA 22102
703-893-3904
A, B, C, E

W. Duvall & Associates, Inc.
530 E. Joppa Road
Towson, MD 21286
410-583-9571
A, C

Wetland Studies and Solutions, Inc.
5300 Wellington Branch Drive, Suite 100
Gainesville, VA 20155
703-679-5600
www.wetlandstudies.com
A, B, C, D, E, F

Wetland Management Specialists
14 Cedar Swamp Road
Smithfield, RI 02917
401-232-5340
A, B, C, E

Wetland Science Applications
PO Box 1022
Poolesville, MD 20837
301-972-8112
A, B, C, E

Wetlands Research Association, Inc.
102 E. Main Street, Suite 305
Newark, DE 19711-7319
301-738-7535
A, B, C

Wetland Training Institute
PO Box 1022
Poolesville, MD 20837
301-972-8112

White Oaks Environmental, Inc.
1304 Knopp Road
Jarrettsville, MD 21084
410-692-0244
wkopajtic@aol.com

Whitman, Requardt & Associates
801 South Caroline Street
Baltimore, MD 21231
410-235-3450
A, B, C, E

Whitney, Bailey, Cox & Magnani
849 Fairmount Avenue, Suite 100
Baltimore, MD 21286
410-512-4500
A, C, E, F

Wildlife Consulting Services
325 Baldwin Street
Morgantown, WV 26505
304-293-4797
A, C, E

Wildman Environmental Services
4747 Bonnie Branch Road
Ellicott City, MD 21043
410-869-9999
A, C, E

William F. Kirwin, Inc.
28 E. Susquehanna Avenue
Towson, MD 21286
410-337-0075
A, B, C

Williamsburg Environmental Group, Inc.
13921 Park Center Road, Suite 160
Herndon, VA 20171
703-437-3096
A, B, C, E, F

William Monk, Inc.
222 Bosley Avenue, Suite C-6
Towson, MD 21204
410-494-8931
A, B, C, E

W. S. Sipple Wetland & Envir. Training & Consulting
512 Red Bluff Court
Millersville, MD 21108
bsip333@aol.com
410-987-4083
A, B, C, D, E, F

Appendix K: Suppliers of Wetland Plants List

This list is for informational purposes only. It is not a complete list of all providers that may offer wetland plants. It is available as a convenience to the public. The Department in no way recommends or guarantees the accuracy or quality of the products offered or services performed by the providers listed. Users of this list should always contact providers directly for a full and complete explanation of services and products offered.

This list will be updated periodically. Additions or changes to the list will be processed upon receipt of a written request and appropriate documentation. Send request to:

Wetlands and Waterways Division
Water Management Administration
1800 Washington Boulevard, Suite 430
Baltimore, Maryland 21230

Revised 1/2010

American Native Plants
4812 East Joppa Road
Perryhall, MD 21128
410-529-0552
410-529-3883 fax
www.americannativeplants.net
(trees, shrubs, and herbaceous)

Angelica Nurseries
11129 Locust Grove Road
Kennedyville, MD 21645
410-928-3111
410-928-3044 fax
www.angelicanurseries.com
(trees and shrubs)

Appalachian Nurseries, Inc.
1724 Clayhill Road
Chambersburg, PA 17201-9338
717-597-0066
877-743-4733
www.appnursery.com
(trees and shrubs)

Aquascapes Unlimited, Inc.
P.O. Box 364
Pipersville, PA 18947
215-766-8151
215-766-8986 fax
www.aquascapesunlimited.com
(herbaceous)

Clear Ridge Nursery, Inc.
217 Clear Ridge Road
Union Bridge, MD 21791
888-226-9226
410-848-5806 fax
www.gonative.us
(trees and shrubs)

Environmental Concern, Inc.
P.O. Box P
201 Boundary Lane
St. Michael's, MD 21663
410-745-9620
410-745-4066 fax
www.wetland.org/nursery_home.htm
(trees, shrubs, and herbaceous)

Ernst Conservation Seeds
9006 Mercer Pike
Meadville, PA 16335
814-336-2404
800-873-3321
814-336-5191 fax
www.ernstseed.com/
(seeds)

Habitat Solutions, Inc.
P.O. Box 14822
Pittsburgh, PA 15228
412-853-7883
412-344-7883 fax
www.habitatsolutions.net/
(trees, shrubs, and herbaceous)

Heartwood Nursery
P.O. Box 519
Stewartstown, PA 17363
717-993-5230
717-993-5239 fax
www.heartwoodnurseryinc.com
(trees and shrubs)

Herring Run Natives
6131 Hillen Road
Baltimore, MD 21239
410-254-1577
http://baywatersheds.org/learn/herring-run-nursery/
(trees and shrubs)

John S. Ayton State Tree Nursery
1-800-TREES-MD
www.dnr.state.md.us/forests/nursery
(Trees and shrubs)

Kollar Nursery
5200 West Heaps Road
Pylesville, MD 21132
410-836-0500
410-836-1931 fax
www.kollarnursery.com/
(trees, shrubs, and herbaceous)

Kurt Bluemel, Inc.
2740 Greene Lane
Baldwin, MD 21013
410-557-7229
800-498-1560
www.kurtbluemel.com
(herbaceous)

Lilypons Water Gardens
6800 Lily Pons Road
P.O. Box 10
Adamstown, MD 21710
800-999-5459
www.lilypons.com/
(herbaceous)

New Moon Nursery
975 Barretts Run Road
Bridgetown, NJ 08302
888-998-1951
888-998-1952 fax
http://newmoonnursery.com/
(herbaceous)

North Creek Nurseries, Inc.
388 North Creek Road
Landenberg, PA 19350
610-255-0100
877-326-7584
610-255-4762 fax
www.northcreeknurseries.com
(herbaceous)

Octoraro Native Plant Nursery
6126 Street Road
Kirkwood, PA 17536
717-529-3160
717-529-4099 fax
www.octoraro.com/
(trees and shrubs)

Pinelands Nursery
323 Island Road
Columbus, NJ 08022
609-291-9486
800-667-2729
609-298-8939 fax
www.pinelandsnursery.com
(trees, shrubs, and herbaceous)

Redbud Native Plant Nursery
1214 N. Middletown Road
Glen Mills, PA 19342
610-358-4300
610-358-3330 fax
www.redbudnativeplantnursery.com
(trees, shrubs, and herbaceous)

Ron's Nursery
7943 Dollyhyde Road
Mt. Airy, MD 21771
240-674-5891
301-829-1183 phone/fax
(tress and shrubs)

RPM ecosystems
2150 Dryden Road
P.O. Box 6
Dryden, New York 13053-9998
607-844-9590
888.776.9590
607-844-9591 fax
www.rpmecosystems.com
(trees and shrubs)

Ruppert Nurseries
7950 Hawkins Creamery Road
Laytonsville, Maryland 20882
301-482-2009
301-482-2099 fax
www.ruppertnurseries.com/
(trees and shrubs)

Signature Horticultural Services
19960 Gore Mill Road
Freeland, MD 21053
410-329-6466
410 329-2156 fax
www.signaturehort.com
(herbaceous)

Sylva Native Nursery and Seed Co.
3815 Roser Road
Glen Rock, PA 17327
717-277-0486
717-227-0484 fax
www.sylvanative.com/
(trees, shrubs, herbaceous, and seeds)

Tidewater Growers
31183 Keller Pond Rd
Keller, VA
757-787 4879 phone/fax
(trees and shrubs)

Wicklein's Water Gardens
1820 Cromwell Bridge Road
Baltimore, Maryland 21234
410-823-1335
800-382-6716
410-823-1427 fax
www.wickleinaquatics.com/
(herbaceous)