MITIGATION PLAN PROPOSAL, PERFORMANCE STANDARDS, AND MONITORING PROTOCOL FOR TIDAL WETLAND MITIGATION
EMERGENT VEGETATION
August 12, 2025

A. **Mitigation Plan:** A Mitigation Plan shall be submitted to MDE for review and approval prior to authorization of the license or permit. Requirements for the Mitigation Plan will be dependent on the scope of the project and whether the Army Corps of Engineers also requires mitigation. The Mitigation Plan should include the following information:

1. Objectives – A summary of the type and amount of resource impacts and the proposal to offset the impacts, including the proposed method of compensation (restoration, establishment, enhancement, or preservation) and how the mitigation will address the needs of the watershed.

2. Site protection instrument – An explanation of how the site will be protected in the future.

3. Baseline information and Plans – A description of the ecological characteristics of the site impacted, as well as the existing conditions of the proposed mitigation site(s). Plans submitted with the Mitigation Plan shall include:

   I. Pre-construction site conditions: These plans should be labeled "Existing Site Conditions" and be no smaller than 1 inch equals 50 feet and include the following: Shoreline orientation, bottom material, depth at toe of bank, width of waterway, depth of waterway, maximum fetch, and distance to nearest edge of channel from Mean High Water Line (MHWL). Detailed descriptions of each Site Condition can be found on the Living Shoreline Waiver Worksheet at: (https://mde.maryland.gov/programs/water/). The plans should also include a delineation of all existing and adjacent tidal and nontidal wetlands, submerged aquatic vegetation, shellfish resources, and show existing elevations referenced to mean low water at the site. Photographs of the affected site should be included showing the existing conditions including types of vegetation.

4. Mitigation work plan – A description of specifications of work, including geographical boundaries of the project, construction methods, timing, sequence of construction, plans to control invasive species, proposed grading plan, a planting plan showing locations and types of vegetation, and cross sections with elevations referenced to mean low water showing any proposed grading or filling. Plans should be no smaller than 1 inch equals 50 feet and include:

   I. Construction Design Plans labeled "Proposed Conditions": These plans show the proposed work including the resources impacted and the square footage of impacts and include any temporary or permanent access roads. They should include information on how the proposed changes impact hydrology, vegetation, and elevations or other wetland resources.

   II. Proposed Mitigation Plans: The Mitigation Plans show the proposed area and type of mitigation. If wetland resources are being converted as a result of the mitigation, a conversion chart should be included listing the types and areas of resources impacted and the type and area of resources proposed in its place.

   III. Landscape or Planting Plans: Plans shall be submitted that detail the planting plan, schedule, and species list, as well as the location of any existing invasive species seed banks (*Phragmites*) and existing native vegetation communities adjacent to the project site.

5. Maintenance plan – A schedule and description of maintenance activities to ensure the project is successful.

6. Performance standards – Ecologically-based standards to determine whether the mitigation project is achieving its objectives, these need to be objective and verifiable, and include clear quantitative and/or qualitative parameters.

7. Monitoring requirements – Include how monitoring will be done, length of time, parameters to be monitored, and schedule of report submittal.

8. Financial assurances – A description of financial assurances that will be provided and how they will ensure the successful completion of the project.

9. Site selection factors – A description of the factors considered in the site selection process.

10. Credit determination – Specify the square footage of impacts, identifying the specific tidal resource affected (e.g., submerged aquatic vegetation (SAV), open water, shallow water, etc.), along with the square footage of proposed mitigation. Provide a clear rationale for the proposed mitigation approach.

11. Long-term management plan – A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the project.

12. Adaptive management plan – A management strategy that addresses unforeseen changes associated with the project and actions that will be taken to address them.

B. **Performance Standards:** Tidal wetland mitigation shall conform to the following performance standards by the end of the monitoring period, unless otherwise determined by the Maryland Department of the Environment Tidal Wetlands Division ('MDE'). All required documentation, including monitoring reports and as-built surveys, shall be submitted to MDE. MDE will use best professional judgment, visual observation, and monitoring reports to evaluate the attainment of performance standards and to determine whether part of or the entire mitigation area is successful or whether corrective actions are warranted. Success will be determined on a transect, plot, field, or cell basis. Presenting averages or means of plot data across a site is not satisfactory to demonstrate success. All of the following standards will be used to assess project success each monitoring year:

1. Vegetated Wetland Area(s):

I. Wetland Vegetation Dominance: Wetland vegetation dominance, defined as a vegetation community where 100% of all dominant plant species across all strata are rated obligate ("OBL"), facultative wet ("FACW"), or facultative ("FAC"), using the vegetation sampling procedures as described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), must be achieved. Vegetation should be native tidal vegetation suitable for the landscape position (high marsh, low marsh).

II. Aerial and Relative Cover Vegetative Standards for Low Marsh Areas:
   a. By the end of monitoring year two, achieve a minimum of 85% coverage by native tidal wetland OBL plant species.

b. The area should maintain 85% or greater native vegetation coverage for at least three consecutive years before the monitoring period ends. If this coverage is not obtained, the monitoring period may be extended for an additional three years.
c. MDE may consider native volunteer species in the aerial coverage estimates (a-b above) when they support functions consistent with the project design goals, including being appropriate for the planned community type.

III. Aerial and Relative Cover Vegetative Standards for High Marsh Areas:
a. By the end of monitoring year two, achieve a minimum of 85% coverage by native tidal wetland (FAC or wetter) plant species. No more than 15% of the native plant species should be FAC plant species.
b. The area should maintain 85% or greater native vegetation coverage for at least three consecutive years before the monitoring period ends. If this coverage is not obtained, the monitoring period may be extended for an additional three years.
c. MDE may consider native volunteer species in the aerial coverage estimates (a-b above) when they support functions consistent with the project design goals, including being appropriate for the planned community type.

IV. Invasive Species: The goal of any mitigation site is to have no invasive species. However, if invasive species are present, no more than 10% of relative plant cover[1] over the entire mitigation site shall be made up by non-native or invasive species, with no individual colony or species greater than or equal to 5% of relative plant cover. No more than 5% of relative plant cover over the entire site shall be made up of *Phragmites australis*[2]. Native status will be based on the Natural Resources Conservation Service Plants Database. Invasive species are identified on the National Park Service/U.S. Fish and Wildlife Service document Plant Invaders of Mid-Atlantic Natural Areas (https://www.invasive.org/alien/pubs/midatlantic/midatlantic.pdf) and the Maryland Invasive Species Council Invasive Species of Concern in Maryland (https://mdinvasives.org/species-of-concern/).

2. Wetland Hydrology:

I. Establish and verify proper tidal hydrology and substrate elevations relative to the closest tidal datum and ensure tidal inundation appropriate to the planned community type is present throughout the site.
II. For areas planned as low marsh, tides must alternately flood and expose the land surface at least once daily. The surface elevations of this wetland type must be between the mean high and mean low tide elevations.
III. For areas planned as high marsh, tides should flood the land surface less often than once daily. The surface elevations of this wetland type must be between the mean high tide and the mean higher high tide elevations.

3. Wetland Soils:
I. The substrate must be of a suitable depth and composition to ensure the survival and growth of wetland plants. The substrate must be stabilized to prevent erosion.

[1] "Relative plant cover" is defined as the cover of a particular species as a percentage of total plant cover. Thus, relative cover will always total 100%, even when total absolute cover is quite low.

[2] American Common Reed, *Phragmites australis* subsp. *americanus*, while uncommon, is not considered to be an invasive plant.

C. Monitoring Protocol:

1. Timeframe: The Licensee/Permittee will be responsible for submitting annual monitoring reports to MDE for five years from the completion of the construction and planting of the mitigation site. Monitoring reports should be concise and effectively provide the information necessary to assess the status of the compensatory mitigation project. Reports should provide the required information, including supporting data such as plans, maps, and photographs, to illustrate site conditions and whether the compensatory mitigation project is meeting its objectives and performance standards. An electronic copy of the 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. Monitoring must be conducted between May 1 and October 30, a minimum of once per year during the monitoring years following the construction of any phase of the mitigation site. These site visits should preferably be during a period with normal hydrologic conditions. Monitoring may be terminated or the extent of monitoring may be reduced over part or the entire site at the discretion of MDE. Conversely, MDE may extend the original monitoring period upon a determination that performance standards have not been met or the mitigation site is not on track to meet them.

2. Monitoring Reports: The following information must be included with the monitoring report:

   I. Overview / Background Data:

      a. Title page indicating the project name (if applicable), site name (if applicable), license number of authorization for associated impacts, monitoring year, Licensee/Permittee and project manager identification (name, address, phone number, and email address), monitoring report preparer identification (name, address, phone number, and email address).

      b. Written description of the location, any identifiable landmarks of the mitigation site, including information to locate the site perimeter(s), and coordinates of the mitigation site (expressed as latitude and longitude).

      c. Date(s) of site inspection(s) for report.

      d. A brief paragraph describing the purpose of the mitigation, including the proposed mitigation acreage and type of aquatic resources approved as part of the mitigation plan. Include the dates the mitigation construction was started, and the planting was completed.

      e. A brief narrative description of the mitigation site addressing its position in the landscape, adjacent waterbodies, and adjacent land use.

      f. A short statement on whether the performance standards are being met.

      g. A narrative description of existing site conditions and how the mitigation site has or has not achieved the goals, objectives, and performance standards established for the project.

      h. Dates of any recent corrective or maintenance activities conducted since the

previous report submission.

i. Specific recommendations for any additional corrective or remedial actions.

j. Estimate the amount of the mitigation site that has been established into each type of wetland system (e.g., tidal low-marsh, tidal high-marsh, beach, open water, etc.). If this differs from what was planned, show the boundaries of the actual wetland area/types on the plans or maps.

II. Requirements: List the monitoring requirements and performance standards, as specified in the approved mitigation plan, and/or special conditions of the authorization, and evaluate whether the compensatory mitigation project site is successfully achieving the approved performance standards or trending towards success. A table is a recommended option for comparing the performance standards to the conditions and status of the developing mitigation site.

III. Summary data: Summary data should be provided to substantiate the success and/or potential challenges associated with the compensatory mitigation project. Take one set of photographs on the same day from established photographic points any time between May 1 and October 30 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. Submitted photos should be formatted to print on a standard 8.5 by 11-inch piece of paper, dated, and clearly labeled with the direction from which the photo was taken. GPS coordinates should be shown on the plans for each photographic reference point and sample plot.

IV. Maps and Plans:

a. Overview: Each map or diagram should be formatted to print on a standard 8.5 by 11-inch piece of paper and include a legend and the location of any photos submitted for review. Maps should be provided to show the location of the compensatory mitigation site relative to other landscape features, habitat types, locations of photographic reference points, transects, sampling data points, and/or other features pertinent to the mitigation plan. In addition, the submitted maps and plans should clearly delineate the mitigation site perimeter(s), which will assist the project managers in locating the mitigation area(s) during subsequent site inspections.

b. As-built plans detailing the boundary of the mitigation project, any modifications to the proposed Design Plans, and providing year one information on hydrology, vegetation, and elevation transects.

V. Conclusions: A general statement shall be included that describes the conditions of the compensatory mitigation project. If performance standards are not being met, a brief explanation of the difficulties and potential remedial actions proposed by the Licensee/Permittee, including a timetable, must be provided. MDE will ultimately determine if the mitigation site is successful for a given monitoring period.

VI. Monitoring Report Measurements for Wetland Area(s):

a. Vegetation:

i. During each monitoring year, to assess the overall site, estimate:

- The percent cover by each plant species (including volunteer plants).
- In the area planned as low marsh, the percent cover of native plants

with a wetland indicator status of OBL.
- In the area planned as high marsh, the percent cover of native plants with a wetland indicator status of FAC (maximum of 15%) or wetter.
- Percent survival of planted species.
- The relative cover of any invasive or non-native plant species.
- Please note that projects where the vegetation is inconsistent throughout the site may not meet the performance standards (e.g. a site where some portions have high densities of FAC or wetter plants but other portions have low densities).

ii. Measurements of vegetation based upon performance standards and methods used to evaluate the vegetative success of the mitigation site.

iii. For each monitoring year, summarize the results from the vegetation plot study, including the percent cover of planted species and percent cover of each wetland species (planted and volunteer) present in order of dominance and for each vegetative stratum. Data should be summarized for each transect, plot and also by field or cell. Do not include the raw plot data in your monitoring report.

b. Hydrology:

i. Establishment of elevation transects coinciding with vegetation monitoring transects. Elevation profiles shall depict all wetland zones, vegetation plots, and transition areas. Elevations should be referenced in feet to Mean Low Water (MLW) = 0.

ii. Establishment of the location of the Mean Higher High Water Line (MHHWL), Mean High Water Line (MHWL), and Mean Low Water Line (MLWL), using onsite monitoring by the applicant and approved by MDE.

iii. Discuss any relevant hydrologic events (e.g., storms) that may have affected the site.

c. Stability

i. Discuss any potential substrate issues affecting plant growth. Estimate the percentage of the site that has erosion problems or slope failure and explain the reasons for these problems.

ii. Discuss how the long-term stability of the site will be maintained.

d. Remediation:

i. Describe any problems observed within the mitigation site, such as: soil stability concerns (e.g., bank or marsh erosion, slope failures, etc.), inappropriate hydrologic regime for the planned wetland community, storm events, invasion by undesirable species of plants or wildlife, poor plant establishment, adverse water quality impacts (i.e., excessive sediment loading, water pollution, etc.), and human encroachment.

ii. Describe the proposed remedial measures and associated schedule to address the problems noted above.

iii. Remedial measures proposed by the Licensee/Permittee are subject to review and approval by MDE prior to implementation. If remedial measures are implemented, the monitoring period may be extended on a case-by-case basis. The chemical treatment of non-native invasive plant species does not

need the approval of the MDE Tidal Wetlands Division, but should be completed at the correct time of year by someone with a current pesticide applicator certification and the required MDE General Permit for Discharges from the Application of Pesticides.

e. Other:
    i. Make note of any wildlife observed during site monitoring.

VII. Recommended Wetland Vegetation Density Measurement Technique: Below are the recommended techniques for monitoring mitigation sites. Alternate techniques may be considered but must be approved in writing by MDE, prior to the commencement of the monitoring period.

a. The following method for measuring the success of the vegetative colonization should be conducted between May 1 and October 30 of each monitoring year, 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 to sample all areas of restored/constructed wetlands at locations adjacent to each photo location marker. Plots should be located within each elevation gradient and spread throughout the site.
c. The following minimum number of samples will be required:
    i. If the site is < 1 acre, then a minimum of 5 plots are required.
    ii. If the site is > 1 acre but less than 3 acres, then a minimum of 4 plots/acre is required.
    iii. If the site is > 3 acres, then a minimum of 3 plots/acre is required.
d. 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. Record GPS coordinates for plot locations. Plot locations should be fixed throughout the monitoring period.
e. Each plot shall be of a size no less than 3'x3' (or circular with approximately the same surface area). The vegetation data shall be collected during the growing season and shall include:
    i. Percent absolute cover of each plant species
    ii. Percent ground cover assessment
    iii. Percent survival by planted species