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. Prior to considering a proposed compensatory mitigation plan, the corps must complete our evaluation of alternatives required by the 404(b)(1) Guidelines, and the permit applicant must avoid and minimize potential impacts to aquatic resources to the maximum extent practicable.

Mitigation Banks or In-Lieu Fee Programs

For permittees meeting their mitigation obligations by securing credits from an approved mitigation bank or in-lieu fee program, mitigation plans only need to include baseline information and determination of credits with the name of the mitigation bank or in-lieu fee program to be used. Prior to issuing the final proffered permit or the authorization to work under a general permit, the permittee must provide proof of mitigation from the approved mitigation bank or in-lieu fee program. This proof of mitigation must be given in the form of the Credit Sale Statement.

1. **Baseline information.** 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. The objective of compensatory mitigation is to offset adverse impacts to waters of the United States authorized by Department of the Army permits, every permit application must include information about the existing condition of aquatic resources located on the project site. This information is used to determine both the number and type of mitigation credits that will be required to offset adverse impacts associated with the proposed project.
2. **Determination of credits.** A description of the number of credits to be provided including a brief explanation of the rationale for this determination. The proposed restoration plan must generate sufficient lift to offset losses at the proposed project site.

* For applicants utilizing bank for compensatory mitigation requirements, information below is not applicable.

Permittee-Responsible Mitigation (PRM)

- The permittee must prepare a draft mitigation plan and submit it to the district engineer (DE) for review.
- 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 permit will be initially proffered.
- The real estate protection and/ or any financial assurances must be in place prior to the final permit issuance.

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 provide compensatory mitigation for adverse impacts to wetlands, streams and/ or other aquatic resources authorized by the proposed permit application. The goal of the anticipated restoration plan must be clearly identified and how the project will address the ecological needs of the watershed.

   Preservation will not account for greater than half of the mitigation effort. Any preservation must meet all of the following criteria, the plan must address all five criteria: a) The resources to be preserved provide important physical, chemical, or biological functions for the watershed; b) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available; c) Preservation is determined by the district engineer to be appropriate and practicable; d) The resources are under threat of destruction or adverse modifications; e) The preserved site will be permanently protected through an appropriate real estate or other legal instrument.

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. Identify the relationship of the site to other federal, tribal, state, and local programs. Permittee responsible mitigation will only be allowed within the same 8-digit HUC as project impacts.

   Information to provide:
   - Hydrological conditions, soil characteristics, other relevant physical and chemical characteristics;
   - Watershed-scale features, such as aquatic habitat diversity, habitat connectivity and other relevant landscape-scale features;
   - The size and location of compensatory mitigation site relative to hydrologic sources (including availability of water rights) and other ecological features;
   - Compatibility with adjacent land uses and watershed management plans;
   - Reasonably foreseeable effects the compensatory mitigation project will have on ecologically important aquatic or terrestrial resources;

- Other relevant factors, including but not limited to development trends, anticipated land use changes, habitat status and trends, the relative locations of the impact and mitigation sites in the stream network, local or regional goals for the restoration or protection of particular habitat types or functions, water quality goals, floodplain management goals and the relative potential for chemical contamination of the aquatic resources.

3. **Site protection instrument.** A description of the legal arrangements and instruments including site ownership that will be used to ensure the long-term protection of the mitigation project site. Indicate if an easement/ servitude or covenant will be used. Indicate what uses will be allowed in the mitigation area (ex. Hunting, structures, dumping, activities inconsistent with the establishment, maintenance and protection of streams and wetlands within the mitigation bank, etc.) and what uses will not be allowed (ex. non-consumptive uses, monitoring, timber harvest according to an approved timber management plan, etc.).

4. **Baseline information.** Impact site: Because the objective of compensatory mitigation is to offset adverse impacts to waters of the United States authorized by Department of the Army permits, every permit application must include information about the existing condition of aquatic resources located on the project site. This information is used to determine both the number and type of mitigation credits that will be required to offset adverse impacts associated with the proposed project.

   Mitigation Site: A description of the ecological characteristics of the proposed mitigation project site. This will include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the location of the mitigation site(s) and 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. The baseline information must be sufficient to support the development of the mitigation work plan.

5. **Determination of credits.** A description of the number of credits to be provided including a brief explanation of the rationale for this determination. The proposed restoration plan must generate sufficient lift to offset losses at the proposed project site. (Credits required from the proposed project site must not exceed credits generated at the proposed mitigation site)
   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.

6. **Mitigation work plan.** Detailed written specifications and design drawings descriptions for the restoration activities at the proposed mitigation site, including: the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water; methods for site preparation; establishing the desired plant community, list species to be planted; plans to control invasive plant species; proposed grading plan; locations for proposed hydrology enhancement; 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. For projects including in-stream work a reference site must be identified. Monitoring plots must be identified on the proposed mitigation work plan. If reference conditions are used to determine the type, scale and success of work, identify reference site.

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 success criteria that will be used to determine whether the mitigation project is achieving its objectives. The goal of the mitigation effort is to be designed in such a way as the site is self-sustaining once performance standards have been achieved. These should be measured success criteria to demonstrate the mitigation site is meeting restoration goals.

   Vegetation Survival:

   Tree Seedling Survival

   - Interim monitoring reports should document planted species meeting 50% survival.
   - At Year 5, there should be 50% or greater survival of planted species. Volunteer species typical of natural forest stands may also be included in trees per acre success criteria. (i.e. if 302 trees per acre planted, 151 trees per acre by year 5)

   Tree Composition and Growth

   - Tree species will be planted to achieve an overall composition, on average, of seven (7) to ten (10) target species or greater per acre from the species planted, with no single species comprising more than 25% of the stocking and hard mast species comprising between 50 to 60% of the total species planted.
   - Demonstration of positive growth in planted trees: lateral canopy diameter, stem diameter, and/or height.
   - Exotic and nuisance species (e.g. Chinese tallow and Chinese privet) shall not comprise more than 5% cover and noxious species (e.g., honey locust, black willow, cotton wood, baccharis) shall not comprise more than 20% of the total stem density during any monitoring event.

Wetland Hydrology:
Wetland hydrology (as defined by current USACE Wetland Delineation Method, 1987 Manual or appropriate Regional Supplement) will be attained and/ or maintained. Assessments will be made using primary and secondary indicators of wetland hydrology.

Shallow groundwater monitoring wells (GPS referenced) with automatic data loggers will be installed within the area for hydrologic manipulations. The data will be used to determine if the site hydrology is sufficient to sustain wetland hydrology-by being within 20% of reference conditions.

Stream Criteria:
Sample stream criteria are below. Use metrics which will best describe success of mitigation activities.

a. *Dimension:* The analysis of representative riffle cross-section shall indicate that it has neither aggraded, degraded, widened, nor narrowed to the point where it has become unstable or will cause instability. The following measurements will be used to aid in making this determination each monitoring year:
    - The Width/Depth Ratio Stability Rating (measured Width/Depth Ratio divided by the baseline Width/Depth Ratio) shall not be greater than 1.3 as appropriate to the associated stream type.
    - The Bank Height Ratio shall not increase or decrease by an amount greater than 0.4 of the baseline Bank Height Ratio.
    - Other measurements to consider include cross-sectional (bankfull) area of the channel, flood prone elevation, bankfull elevation, flood prone width, entrenchment ratio, mean depth, bankfull width, and hydraulic radius to demonstrate the project meets stated restoration goals.
b. *Pattern:* The analysis of the plan-view survey or field measurements shall indicate that the stream is not migrating significantly to the point where it will cause significant bank erosion and cause instability. The following standards will be used to aid in making this determination each monitoring year:
    - Within any given year, the sinuosity of the stream shall not increase or decrease by an amount greater than 0.2 of the approved channel design and associated stream-type or evolutionary phase.
    - The centerline of each channel cross-section will not move by more than 20% of the width of the approved as-built channel width in any given year.
    - The Radius of Curvature/Width Ratio shall remain within the range of variability present in the design criteria.
c. *Profile:* The analysis of the longitudinal profile shall indicate that the bed elevation has neither aggraded nor degraded to the point where it will cause instability. The following performance standards will be used to aid in making this determination each monitoring year:

- The analysis of the Longitudinal Profile shall not indicate significant alterations in the target locations, depths, and slopes of stream features (riffle, run, pool, and glide).
- Bankfull Shear Stress, and Mean Depth and Slope (calculated using Critical Dimensionless Shear Stress) shall be appropriate for transporting the D50 of either the bar sample or the sub-pavement sample.
- The slope of the longitudinal profile shall not increase or decrease by an amount greater than 0.2% of the appropriate stream type.

d. *Stream Reach Stability:* The analysis of the streambank from the top of the bank to the ordinary high water mark shall indicate a significant amount of natural protection to prevent streambank erosion that could jeopardize the stability of the streambank or the stream reach.

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. Yearly monitoring reports must be submitted to the DE. The monitoring locations must be identified in the proposed plan. Monitoring plots must cover at least 10% of the mitigation site and be at least 1/10 acre randomized circular plots established using an evenly distributed grid approach. Photographs must be submitted from the center of each monitoring plot. Monitoring must be done according to the Vicksburg District's current monitoring plan specifications and by a qualified professional.

   At the end of the monitoring period, as indicated on the approved mitigation plan, indicate how the success criteria were met and how the mitigation site met the goals of the approved mitigation plan.

10. **Long-term management plan**. A description of how the mitigation project will be managed after performance standards has been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management. If long term management is transferred to a third party, land stewardship entity, such as a public agency, non-governmental organization, or private land manager, this steward must be identified and approved prior to transferring responsibility.

11. **Adaptive management plan**. A management strategy to address unforeseen changes in site conditions or other components of the mitigation project. For Permittee Responsible Mitigation, the permittee is responsible for addressing unforeseen circumstances preventing the site from meeting success criteria.

12. **Financial assurances.** Financial assurances will be established for all mitigation efforts. 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. A cost estimate sheet should be provided to determine financial assurances are sufficient for the site. Any long-term financing mechanisms must be approved in advance of the activity causing the authorized impacts.

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