

APPENDIX

A.1. Explanation of Technical Analyses for PPL 9 Projects

A.1.1 Designs and Cost Analysis. During the plan formulation process, each of the Task Force agencies assume responsibility for developing designs, and estimates of costs and benefits for a number of candidate projects. The cost estimates for the projects are to be itemized as follows:

1. Construction Cost
2. Contingencies Cost (25%)
3. Engineering and Design
4. Environmental Compliance
5. Supervision and Administration (Corps (\$500/yr administrative and \$30,000 minimum, up to 6% of construction per project for project management, and the Louisiana Department of Natural Resources (LADNR) Project Management (2% of construction))
6. Supervision and Inspection (Construction Contract)
7. Real Estate and Permitting
8. Operation and Maintenance
9. Monitoring

In addition, each lead agency is to provide a detailed itemized construction cost estimate for each project.

An Engineering Work Group has been established by the Planning and Evaluation Subcommittee, with each Federal agency and the State of Louisiana represented. The work group reviews each estimate for accuracy and consistency.

When reviewing the construction cost estimates, the work group verifies that each project feature had an associated cost and that the quantity and unit price for those items were reasonable. In addition, the work group reviews the design of the projects to determine whether the method of construction is appropriate and the design is feasible.

All of the projects are to be assigned a contingency cost of 25 percent because detailed information such as soil borings, surveys, and -- to a major extent -- hydrologic data are not available, in addition to allowing for variations in unit prices.

Engineering and design, environmental compliance, supervision and administration, and supervision and inspection costs are to be reviewed for consistency, but ordinarily are not changed from what was presented by the lead agency.

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A.1.2 Benefit Analysis (WVA). The Wetland Value Assessment, or WVA, is a quantitative, habitat-based assessment methodology developed for use in prioritizing project proposals submitted for funding under the Breaux-Johnston Act. The WVA quantifies changes in fish and wildlife habitat quality and quantity that are projected to emerge or develop as a result of a proposed wetland enhancement project. The results of the WVA, measured in Average Annual Habitat Units (AAHUs), can be combined with economic data to provide a measure of the effectiveness of a proposed project in terms of annualized cost per AAHU protected and/or gained.

The Environmental Work Group are to develop the WVA for each project. The Environmental Work Group is assembled under the Planning and Evaluation Subcommittee of the CWPPRA Technical Committee. The Environmental Work Group includes members from each agency represented on the CWPPRA Task Force. The WVA was designed to be applied, to the greatest extent possible, using only existing or readily obtainable data.

The WVA process has been developed strictly for use in ranking proposed CWPPRA projects; it is not intended to provide a detailed, comprehensive methodology for establishing baseline conditions within a project area. Some aspects of the WVA have been defined by policy and functional considerations of the CWPPRA; therefore, user-specific modifications may be necessary if the WVA is used for other purposes.

The WVA is a modification of the Habitat Evaluation Procedures (HEP) developed by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service, 1980). HEP is widely used by the Fish and Wildlife Service and other Federal and State agencies in evaluating the impacts of development projects on fish and wildlife resources. A notable difference exists between the two methodologies. The HEP generally uses a species-oriented approach, whereas the WVA uses a community approach.

The WVA process was developed for application to the following coastal Louisiana wetland types: fresh marsh (including intermediate marsh), brackish marsh, saline marsh, and cypress-tupelo swamp. Future reference in this document to "wetland" or "wetland type" refers to one or more of those four communities.

The WVA operates under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated or expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of the following components:

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1. a list of variables that are considered important in characterizing fish and wildlife habitat:
 - a. V₁--percent of wetland covered by emergent vegetation,
 - b. V₂--percent open water dominated by submerged aquatic vegetation,
 - c. V₃--marsh edge and interspersion,
 - d. V₄--percent open water less than or equal to 1.5 feet deep,
 - e. V₅--salinity, and
 - f. V₆--aquatic organism access.
2. a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and
3. a mathematical formula that combines the Suitability Index for each variable into a single value for wetland habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI.

The WVA models have been developed for determining the suitability of Louisiana coastal wetlands for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. Models have been designed to function at a community level and therefore attempt to define an optimum combination of habitat conditions for all fish and wildlife species utilizing a given marsh type over a year or longer.

The output of each model (the HSI) is assumed to have a linear relationship with the suitability of a coastal wetland system in providing fish and wildlife habitat.

A.1.3. Economic Analysis. The Breaux Act directed the Task Force to develop a prioritized list of wetland projects "based on the cost-effectiveness of such projects in creating, restoring, protecting, or enhancing coastal wetlands, taking into account the quality of such coastal wetlands." The Task Force satisfied this requirement through the integration of a traditional time-value analysis of life-cycle project costs and other economic impacts and an evaluation of wetlands benefits using a community-based version of the U.S. Fish and Wildlife Service's Habitat Evaluation Procedure. The product of these two analyses was an Average Annual Cost per Average Annual Habitat Unit figure for each project, which was used as the primary ranking criterion. The method permits incremental analysis of varying scales of investment and also accommodates the varying salinity types and habitat quality characteristics of project wetland outputs.

The major inputs to the cost effectiveness analysis are the products of the lead Task Force agencies and the Engineering and Environmental Work Groups. The cost estimates of each project are to be evaluated and refined into estimates of annual implementation costs and respective AAHUs.

Implementation costs are to be used to calculate the economic and financial costs of each wetland project. Financial costs chiefly consist of the resources needed to plan, design, construct, operate, monitor, and maintain the project. These are the costs, when adjusted for inflation, which the Task Force uses in budgeting decisions. The economic

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costs include, in addition to the financial cost, monetary indirect impacts of the plans not accounted for in the implementation costs. Examples would include impacts on dredging in nearby commercial navigation channels, effects on water supplies, and effects on nearby facilities and structures not reflected in right-of-way and acquisition costs.

The stream of economic costs for each project are to be brought to present value and annualized at the current discount rate, based on a 20-year project life. Beneficial environmental outputs are to be annualized at a zero discount rate and expressed as AAHUs. These data are then to be used to rank each plan based on cost per AAHU produced. Annual economic costs are also to be calculated on a per acre basis. Financial costs are to be adjusted to account for projected levels of inflation and used to monitor overall budgeting and any future cost escalations in accordance with rules established by the Task Force.

Following the review by the Engineering Work Group, costs are to be expressed as first costs, fully funded costs, present worth costs, and average annual costs. The Cost per Habitat Unit criterion is to be derived by dividing the average annual cost for each wetland project by the Average Annual Habitat Units (AAHU) for each wetland project. The average annual costs figures are to be based on price levels for the current year, the most current published discount rate, and a project life of 20 years. The fully funded cost estimates developed for each project are to be used to determine how many projects could be supported by the funds expected to be available in the current fiscal year. The fully funded cost estimates include operation and maintenance and other compensated financial costs.

A.2. Candidate Project Ranking Process.

In an attempt to make the selection process rigorous, use is to be made of a procedure developed by the Technical Committee. This procedure takes into account various criteria to produce an overall ranking of candidate projects. The criteria are evaluated such that each project would have a maximum value of 10 points. Each criterion is weighted in a manner deemed appropriate by the committee to reflect its relative importance, and the sum of the resulting values yields a score for each project. Candidate projects are to be ranked according to these scores to produce a recommended list for consideration by the Task Force. The Technical Committee requires a two-thirds majority vote for any deviation from the ranked list. Table 1 of the Appendix lists the criteria and their assigned weights.

Table 1
Candidate Project Ranking Criteria

| Criterion | Weight |
|--------------------------------------|--------|
| Cost-Effectiveness | 0.55 |
| Longevity/Sustainability | 0.15 |
| Support of Restoration Plan Strategy | 0.15 |
| Supporting Partnerships | 0.05 |
| Public Support | 0.05 |
| Risk/Uncertainty | 0.05 |
| Total | 1.00 |

A.2.1. Cost-Effectiveness. The committee agreed that cost-effectiveness is the single most important criterion in the ranking and selection of projects (it is, in fact, the only criterion mentioned in the Act). For this reason, the committee assigned a weight of 0.55 to the cost-effectiveness index, so that it would count for more than half of a project's total score. The index itself is based on a comparison of the relative values of projects' cost-effectiveness as measured by the ratio of average annual costs to average annual habitat units. A base 10 logarithm is used to prevent skewing of the results in the case of a project with a very high average annual fully funded cost/AAHU (very low cost-effectiveness). The equation for determining the cost-effectiveness index is given below.

$$\text{Cost-effectiveness index of project } n = 5 \log_{10}(100(E_n/E_1)),$$

where E_1 = average annual fully
funded cost/AAHU of
the most cost-
effective project
and E_n = average annual fully
funded cost/AAHU of
project "n"

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In the case of the most cost-effective project (the project with the lowest average annual fully funded cost/AAHU), the term E_n/E_1 has the value of unity, and the cost-effectiveness index is 10.

A.2.2. Longevity/Sustainability. This criterion measures a project's estimated ability to continue to produce wetlands benefits over time. Projects that achieve long-term maintenance or restoration of natural processes (such as sediment transport via a crevasse) and can be sustained without extensive replacement actions will be favored over projects that will produce only short-term benefits or require extensive maintenance or replacement of project features to sustain long-term wetland benefits. The determination of longevity/sustainability is to be made by the Environmental and Engineering Work Groups, considering the following factors.

1. The ability of a project (including planned operation, maintenance, and replacement actions) to provide wetland benefits through the end of the 20-year project life.
2. The project's ability to provide wetland benefits beyond target year 20 without any further operation, maintenance, or replacement of project features. This evaluation would consider effects of anticipated site-specific conditions, such as hydrology, wave energy, saltwater intrusion, subsidence, and landscape conditions.
3. The extent that a project provides sediment, or facilitates or maintains peat build-up, sufficient to withstand or offset relative sea level rise and storm events.
4. Predictions of longevity/sustainability made through use of reliable simulation models, especially in the case of projects where there is substantial uncertainty and such models can be employed at a reasonable cost and in a timely manner.

Each work group representative and the assigned member of the Academic Assistance Group is to score each project based on the one condition from among those listed below which they determined to be most applicable. An average score will then be taken.

1. Project expected to continue providing substantial wetland benefits more than 40 years after construction: 10 points.
2. Project expected to provide substantial wetland benefits 30 to 40 years after construction: 7 points.
3. Project expected to cease providing substantial wetland benefits 20 to 30 years after construction: 3 points.
4. Project expected to cease providing substantial wetland benefits less than 20 years after construction: 0 points.

A.2.3. Support for Restoration Plan. Candidate projects that are identified in the November 1993 *Louisiana Coastal Wetlands Restoration Plan* or subsequent revisions as "critical" projects are to be given a score of 10 in this category. Candidate projects that are listed as supporting or altogether new received a score of 3.

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A.2.4. Supporting Partnerships. The State’s required cost share for CWPPRA projects is derived from the State’s Wetlands Conservation and Restoration Fund (Trust Fund). The degree to which non-Federal partnering entities agree, in writing, to contribute all or part of the State’s cost-share with non-Trust Fund sources will weigh favorably in project selection; contributions could consist of cash or in-kind services, including those covering maintenance, operation, or replacement expenses. Donation of land rights would not be considered as a financial contribution. The following formula is to be used to calculate the partnership index, which cannot exceed 10 points:

$$\text{Partnership Index} = 10(\text{PS}/\text{SS}),$$

Where: SS = dollar amount of the required percent non-Federal cost share¹
and PS = dollar amount of the non-Federal partner contribution (other than that provided via the Trust Fund).

A.2.5. Public Support. The degree of public support (evidenced by written endorsement or testimony at a CWPPRA-related public meeting) is an indicator of a project’s acceptability and implementability.

Traditionally in past lists, values were assigned according to which of the following conditions applied to each project.

1. Project is supported by local and State elected officials and Congressional representatives: 10 points.
2. Project is supported by 2 of above entities: 7 points.
3. Project is supported by 1 of above entities: 3 points.
4. Project without support by any of the above entities: 0 points.

A.2.6. Risk/Uncertainty. Projects with a greater probability of long-term success are ranked higher than those for which there is a greater level of uncertainty regarding success. Uncertainty may stem from a project’s location in a rapidly changing or subsiding area, vulnerability to hurricane damage, or the use of untested or otherwise questionable methods. Risk may arise when contaminated sediments, water quality issues, or other problems are involved.

Each Task Force agency’s Environmental Work Group member and a representative from the Academic Assistance Group will score each project between 0 and 10. The higher the score the greater the degree of confidence that the project will meet its objectives. Points are to be averaged for each project to determine the final raw scores.

¹ The cost share is set at 85% Federal – 15% Non-Federal for PPL 9 and beyond.