ATTACHMENT 6A

RESPONSES TO 2000 DRAFT REPORT
NGO AND INDIVIDUALS

YAZOO BACKWATER AREA REFORMULATION
APPENDIX 5
COORDINATION

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INTRODUCTION

The following comments were taken from nongovernmental organizations and individual letters received after the Yazoo Backwater Reformulation draft report release. This attachment contains the U.S. Army Corps of Engineers, Vicksburg District, official response to the issues raised.

1. Letter, Ms. Julia Balter, 24 November 2000. (Exhibit 4A-1)

a. Comment. Intensifying agriculture would be accomplished by destroying 200,000 acres of wetlands.

Response. Independent estimates were made by the U.S. Army Corps of Engineers, Vicksburg District, and the Environmental Protection Agency (EPA) for the Final Report. Both place the total wetland resources in the project area at approximately 200,000 acres (Vicksburg District 189,000 and EPA 216,000). The Vicksburg District analysis determined that approximately 26,300 may no longer qualify as Federally-defined wetlands and 40,700 acres will remain wetlands, but have different backwater flood duration. The baseline wetland functional capacity is 885,300 functional capacity units (FCU), and the net functional loss is 14,200 FCUs. This loss represents 1.6 percent of the baseline functional capacity. The Vicksburg District estimate only includes wetlands sustained by backwater flooding, while the EPA estimate includes wetlands sustained by either precipitation or flooding. The nonstructural feature of the project will reforest up to 55,600 acres of cropland primarily within the 1-year flood plain. The guidelines under which the U.S. Army Corps of Engineers, Vicksburg District, analyzes agricultural flood control projects allow for two separate categories of benefits to agricultural crops--inundation reduction and intensification. Inundation reduction benefits are on cropland where there is no change in cropping patterns, and intensification benefits are on cropland where there is a project-induced change in cropping patterns. There are no intensification benefits to any of the alternatives evaluated in the final array of alternatives for the Yazoo Backwater Reformulation Study. Implementation of this project will reduce total acres in crop production. While the lessening of flooding would possibly increase production on existing agricultural lands, Federal agricultural policy remains in place, which would discourage the clearing and draining of any wetlands.

b. Comment. This project will increase pesticide contamination in the area.

Response. Reforestation of up to 55,600 acres of cropland will reduce erosion and nonpoint source runoff of sediment, pesticides (DDT and toxaphene), and fertilizers into study area streams. As these lands are converted to forest lands, applications of current use pesticides and fertilizers will also be reduced. In addition, the Hydrogeomorphic (HGM) wetland functional analysis shows that reforestation of agricultural land should increase the removal of these agricultural chemicals from floodwaters. The U.S. Department of Agriculture (USDA) and EPA report that fertilizer and pesticide use has not increased over the past 20 years, but has remained constant. The trend has been toward pesticides that are less toxic and less persistent in the environment than the organochlorine pesticides, DDT and toxaphene. The Vicksburg District does not believe the flood protection provided by the recommended plan will alter current land use such that additional acres of existing forest will be cleared. Postproject, forested acres will remain forested, and agricultural acres should remain in agriculture or be converted to forests. Existing agriculture land that is not reforested will continue to export sediment and other agricultural chemicals into study area water bodies at current rates. Overall, reforestation will reduce future pesticide and fertilizer use and will reduce the amount of these materials entering study area waters though erosion processes.

c. Comment. The project cannot assure that even a single family's home will be flood free.

Response. There are approximately 1,300 homes that are impacted under existing conditions by a 100-year frequency flood. With implementation of the proposed Yazoo Backwater Area Project, approximately 800 of these homes would be free from flooding by the 100-year event. The project would also reduce the damages and duration of flooding for the remaining structures.

Flooding impacts even those residents whose homes have not flooded in the past. Residents contend with significant flooding of roads and bridges and other appurtenances in the study area. Flooding of transportation facilities in the area disrupts educational activities, access by emergency vehicles, access to doctor and dental offices by area residents, purchasing food to maintain proper nutrition, as well as creating other problems for area residents in their daily lives. Health, safety, and welfare of area residents were primary factors in developing the recommended plan. This proposed project would help to alleviate much of the hardship of flooding in the study area.

d. Comment. Reforestation aspect of the project is unrealistic due to the 1999 Mississippi State tax issue.

Response. The 1999 Mississippi State tax law only allows easement lands for the Yazoo Backwater project to be assessed a fee equal to the loss of revenue resulting from the change of land use due to this project. This fee is a county option by each county Board of Supervisors in the study area and cannot exceed $4 per acre. Vicksburg District Real Estate appraisers determined that the amount of land tax is not a deciding factor with the purchase of easements.

2. Letter, Marion D. Adams, 3 October 2000. (Exhibit 4A-2)

a. Comment. This is a wasteful project that benefits only a handful of people, but at tremendous expense to taxpayers and the environment.

Response. There are over 1,300 homes in the area that are impacted by the 100-year frequency event. The majority of these homes are located in Sharkey and Issaquena Counties where approximately 31 percent of the population lives below the poverty level. In addition to local benefits, the project would also provide additional national benefits. Everyone who uses stores, schools, roads, medical facilities, or owns businesses and farms would benefit. Project benefits will return $1.4 in economic benefits to the country for every $1 invested. The project as proposed would replant up to 87 square miles of the alluvial flood plain, an area which accounts for approximately 20 percent of farmland that is now in use. This will provide a net increase in environmental resources in the project area (see next response).

b. Comment. The pumps would destroy some of the best remaining forest along the lower Mississippi River, which provide habitat for bald eagles, alligator, bobcat, deer, and the threatened Louisiana black bear.

Response. The YBWP is a balanced approach of structural and nonstructural features to solving the needs of the South Delta. The structural feature provides for the construction of a pump station that would result in the loss of a 38-acre tract of forested land and 5.6 acres of open water. No additional clearing would be required for implementation of the project, and the Vicksburg District expects no additional clearing for agriculture with project implementation. The nonstructural feature of the project provides for reforestation/conservation easements on up to 55,600 acres of agricultural lands that would provide a significant environmental benefit to the backwater area. This land-use conversion from agricultural to bottom-land hardwoods would result in a significant increase in environmental habitat for the Louisiana black bear and other wildlife species by connecting fragmented tracts of forested land. This reforested land would also create a significant buffer between agricultural activities and the aquatic environment, which would result in improved water quality in the lower Delta.

Separate analyses of habitat functions for waterfowl, wetland, terrestrial, and aquatic resources have documented both the positive and the negative impacts to the environment from the recommended plan. These studies showed that terrestrial resources would increase 11.2 percent, wetland resources would increase 19.5 percent, aquatic spawning resource would increase 30.3 percent, aquatic rearing resource would increase 8.0 percent, and waterfowl resources would increase 52.8 percent.

The U.S. Fish and Wildlife Service (FWS) concurred with the Vicksburg District determination that the project is not likely to adversely affect the threatened Louisiana black bear. The FWS has also determined that the project will not jeopardize the continued existence

of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

c. Comment. The project threatens highly productive freshwater lakes and swamps that support a burgeoning hunting, fishing and ecotourism industry.

Response. The project does not threaten highly productive freshwater lakes and swamps. Operation of the pump station would reduce water levels in 121 acres of backwater lakes in the 2-year frequency flood plain. This represents 1.4 percent of backwater lake acreage within the base 2-year frequency flood plain. This effect assumes that backwater flooding is the sole source of water to maintain these lakes, and that the 51 inches of annual precipitation has no role in maintaining lake levels. The pump station would be designed for a nominal pump-on elevation of 87.0 feet, NGVD (1-year frequency flood at the Steele Bayou structure). At this elevation, 216,000 acres would be flooded. The reforestation of up to 55,600 acres of agricultural lands will increase the available resources for hunting, fishing, and ecotourism while providing an additional source of nutrients to sustain the productivity within the lakes and swamps.

d. Comment. The pumps would establish a dangerous precedent for the nation's flood control policy.

Response. It is unclear as to what precedent for the Nation's flood control policy to which you refer since there are numerous other pump stations already in operation that evacuate water from behind levees and floodgates.

3. Letter, Timothy Klika, 21 November 2000. (Exhibit 4A-3)

a. Comment. This project is in direct conflict with the Nation's policies of the protection of wetland habitat areas.

Response. The project as proposed will result in a 19.5 percent increase in wetland functional value from reforesting up to 55,600 acres of agricultural land. This improves wetland functional value.

b. Comment. This project will drain and damage 200,000 acres of wetlands, twice the number of acres destroyed each year across the country by all public and private projects combined.

Response. See response 1a.

c. Comment. Promote increased pesticide and fertilizer use in a region already plagued by toxic contamination.

Response. See response 1b.

d. Comment. Waste millions of tax dollars to increase agricultural production when the Federal government is spending billions of farm subsidies and on taking excess and sensitive cropland out of production.

Response. If implemented, the project will reforest up to 55,600 acres of agricultural lands, removing these acres from production and helping to reduce the surplus of acres currently in crop production. Project implementation would reduce the amount of agricultural land in the Yazoo Backwater Study Area. The proposed project would not change the extent of the 1-year flood. The agricultural benefits associated with this project would be limited to adjusting to modern farming practices (planting earlier in the growing season), thereby increasing yields on the remaining cropland.

e. Comment. The $181 million earmarked for the Yazoo pump project could be better spent in the region for improving basic services, reducing pesticide pollution, flood protection and diversifying the region's economy.

Response. The economic analyses show that for each dollar expended, $1.4 would return to the National Economic Development (NED) account. This reflects a sound economic investment in the Yazoo Backwater Area Project. In addition, this project also improves the health, safety, and welfare of the residents of the project area, as well as improving the environmental situation of the lower Delta.

4. Letter, Mr. Jack A. Ziemke, 21 October 2000. (Exhibit 4A-4)

a. Comment. Corps is creating work for itself, establishing a precedent, and damaging the environment at a high cost with limited benefits.

Response. All USACE work is authorized and funded by Congress. The project as formulated will:

- Reforest nearly 87 square miles of the alluvial flood plain (20 percent of the farmland in the lower Delta). The wetland resources in the study area would increase by 19.5 percent under the proposed plan. With project, these lands will continue to flood every year. Currently, natural drainage takes water levels lower than this project proposes.

- There are 1,300 homes that would be impacted under existing conditions by a 100-year flood. With implementation of the proposed Yazoo Backwater Area Project, over 800 of these homes would be free from flooding by the 100-year event. The remaining homes face less damage less often, less severely, and for a shorter duration.

- Significantly increase in environmental habitat and increase water in the Delta during dry months. The pumps would operate on average 1 month per year to lower the peak elevation of higher floods. We would also be able to hold more water in the low-water months such as during the summer of 2000 when the whole lower Delta would have dried up without Vicksburg District water management structures.

- Provide up to 55,600 acres of potential habitat for the Louisiana black bear and the endangered plant pondberry.

- Reduce the need for pesticide and fertilizer by reforesting up to 55,600 acres of agricultural lands and reducing the potential for chemicals to be washed away by floods. With stable water levels, farmers could use their chemicals more effectively on less acreage.

- Return $1.4 in economic benefits for every $1 invested. Approximately 30 percent of the project cost is for nonstructural flood control and environmental features. The project returns money to the Federal Treasury, which makes a benefit for every American citizen, not just the residents of the lower Delta. All USACE projects must return a dollar for each dollar expended on investment.

5. Letter, Jay A. George, 25 October 2000. (Exhibit 4A-5)

a. Comment. Nothing new has flooded in the basin since farmers decided to plow it.

Response. Congress authorized this project in 1941 to address the increased flooding in the project area due to the elimination of the Eudora Floodway and the increased stages this created in the Yazoo Backwater Area. The 1973 flood event inundated 630,000 acres.

b. Comment. The project would be shut down due to increased energy costs.

Response. Economic team members evaluated energy costs in the economic analysis, and the resulting benefit-cost ratio (BCR) demonstrates that the project is feasible.

6. Letter, Mr. Jim Sweeney, 4 November 2000. (Exhibit 4A-6)

a. Comment. This is a “make work” project for the Corps that would not have passed a cost benefits analysis if it were not for specific legislative maneuvers by members of the US Congress that support wasteful and destructive pork projects.

Response. See response 4a.

b. Comment. The project destroys bottom-land forest.

Response. The nonstructural flood control feature of the proposed project would increase bottom-land hardwoods by reforesting up to 55,600 acres of agricultural lands. Project implementation would require only 38 acres of forested land to be cleared. The Vicksburg District expects no additional lands cleared for agricultural production.

c. Comment. The project threatens endangered species.

Response. The U.S. Fish and Wildlife Service (FWS) concurred with the Vicksburg District determination that the project is not likely to adversely affect the threatened Louisiana black bear. The FWS has also determined that the project will not jeopardize the continued existence of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

d. Comment. The Corps is able to work by a different set of rules, instead of abiding by the law of "avoid and minimize impacts on the environments."

Response. There is a detailed “avoid-and-minimize” analysis contained in Appendix 1. This analysis is consistent with the 1990 Memorandum of Agreement between the Vicksburg District and EPA. Separate habitat-based analyses for waterfowl, wetland, terrestrial, and aquatic resources have documented both the positive and negative impacts to the environment from the recommended plan. These studies showed that terrestrial resources would increase 11.2 percent, wetland resources would increase 19.5 percent, aquatic spawning resource would increase 30.3 percent, aquatic rearing resource would increase 8.0 percent, and waterfowl resources would increase 52.8 percent.

7. Letter, Mr. Robert Eiland, No Date. (Exhibit 4A-7)

Comment. Instead of dredging, clearing, and pumping, if we were to rebuild the locks and dams, put in some weirs maybe we could control floodwaters, while at the same time adding some recreational fishing, boating, etc., as was done on the Tombigbee.

Response. The Yazoo Backwater Reformulation Study is a flood control project with nonstructural and environmental features, which analyzes the interior area protected by the Yazoo Backwater Levee. The study team based project benefits only on flood damages prevented and environmental benefits realized from the recommended plan. The only dredging and clearing required for the recommended plan will be limited to the pump station site. The pump station inlet channel, outlet channel, and the cofferdam were constructed in 1986.

The Tombigbee Project that you refer to is a navigation project, much like the old navigation system that once existed on the Big Sunflower River that you reference. Recreational benefits such as boating, fishing, etc., are a benefit from these navigation projects, but the economic team did not use them. Navigation projects and weirs do provide a limited amount of recreational and flood control benefits. The Vicksburg District has already constructed 13 weirs throughout the study area which provide for enhanced environmental habitat and channel stability.

8. Letter, Mr. Hurst R. Hessey, 21 November 2000. (Exhibit 4A-8)

a. Comment. This project is hard to justify in light of the ecological damage caused by similar projects such as in the Everglades.

Response. The Yazoo Backwater Area Project is not similar to the old Everglades projects. Separate analyses of habitat functions for waterfowl, wetland, terrestrial, and aquatic resources have documented both the positive and the negative impacts to the environment from the recommended plan. These studies showed that terrestrial resources would increase 11.2 percent, wetland resources would increase 19.5 percent, aquatic spawning resource would increase 30.3 percent, aquatic rearing resource would increase 8.0 percent, and waterfowl resources would increase 52.8 percent.

b. Comment. I suspect that if the pumps project is undertaken, in 50 years we will be trying to fix the Yazoo backwater. We should simply solve the problem now and not undertake the pumps project.

Response. This project was authorized by Congress in 1941 and was reformulated by the Vicksburg District to meet current conditions and needs. The reformulation process included an extensive 3-year consensus process with participants from Federal and state agencies, environmental groups, levee boards, and local residents to address the flooding and environmental problems within the Yazoo Backwater Study Area.

9. Letter, Robin Mann, 4 December 2000. (Exhibit 4A-9)

a. Comment. Project is wholly inconsistent with federal agricultural and floodplain management policies.

Response. See responses 1a, 3d, and 4a.

b. Comment. The project would cause massive and unjustified environmental damage.

Response. See responses 2b, 2c, 6b, and 6d.

c. Comment. The project benefits a small number of agribusiness interests at the expense of the federal taxpayer.

Response. See responses 1b, 2a, and 3d.

d. Comment. The project would not solve the main flooding problems.

Response. See responses 1c and 4a.

e. Comment. Two-thirds of the economic benefits would accrue to intensified row cropping marginal land, which is diametrically opposite to the direction the nation direction on reducing cropping in environmentally sensitive areas.

Response. The Final Report has revised the economic benefits. Intensification, for the purposes of this project, was defined as a change in the cropping pattern or an increase in total production. There was no change in cropping patterns, or land clearing, projected in the future with the implementation of this project. The nonstructural component of this project will remove up to 55,600 acres of agricultural land from production. The two counties that make up 87 percent of the study area have already achieved their WRP enrollment caps. Without the nonstructural component of the recommended plan, it is unlikely that additional agricultural lands would be taken out of production.

f. Comment. The project will intensify production in areas that will greatly add to the already serious problems associated with pesticide and fertilizer contamination.

Response. See responses 1a and 1b.

g. Comment. The Corps did not give equal consideration to nonstructural alternatives for flood control and floodplain management, through reforestation, in direct contravention of Administration policy.

Response. The Vicksburg District gave equal consideration to all structural and nonstructural plans. The final array included four nonstructural, one structural, four combination alternatives, and a no-action alternative. All of the plans, except for the structural and no-action alternatives, included a reforestation component. These alternatives included nonstructural plans proposed by EPA and FWS. The Vicksburg District used the same procedures to evaluate all the alternatives. Several additional nonstructural alternatives were evaluated in earlier arrays. See the Final Report for descriptions of these alternatives.

h. Comment. This project would directly cause the loss and degradation of somewhere near 200,000 acres of wetlands in the backwater area.

Response. See response 1a.

i. Comment. The Corps has apparently vastly understated the acreage of impact, and the EPA has only been able to come up with a rough estimate.

Response. The Vicksburg District has revised Appendix 10 to include a new estimate of wetland extent. The wetland extent was verified by an extensive field study designed by EPA, utilizing their EMAP program. The field verification was carried out by personnel from EPA, NRCS, FWS, and the Vicksburg District. The 2000 Draft Report estimated there were 48,500 acres of wetlands within the study area. The revised study estimates there are 189,600 acres of wetlands in the study area. The EPA independently estimated there were 216,000 acres of wetlands within the study area. The Vicksburg District estimate is restricted to wetlands sustained by backwater flooding, while the EPA estimates wetlands sustained by precipitation, headwater flooding, and backwater flooding. The nonstructural component of the recommended plan will increase wetland functional value by 19.5 percent.

j. Comment. The EPA's plan addresses the real needs for flood protection, of those residences and businesses that are impacted by flooding.

Response. The Vicksburg District carefully considered all of EPA's comments and carried forward a variation of the Shabman Plan, despite the fact that it was not economically justified. The EPA's Shabman Plan does address relocation of residents and businesses subject to frequent flood damage. This feature does not fully address the flood damage reduction needs of the study. In addition, it only addresses agricultural flood damage reduction by the reforestation of 88,000 acres within the 2-year flood plain. The Vicksburg District's recommended plan addresses impacts to residences, structures, and agricultural land within the 100-year flood plain. The EPA's plan does not meet the study's objectives.

k. Comment. I do not want my taxes going towards destroying what is left of the bottomland hardwood forest in the Mississippi Delta by the very agency charged with administering federal wetlands protections.

Response. The Vicksburg District acknowledges the view presented by the comment.

10. Letter, signed by several individuals, 27 October 2000. (Exhibit 4A-10)

a. Comment. Request that the comment period for this project is extended at least a year and that an independent consultant make a study of this project.

Response. The comment period was extended an additional 30 days for the Draft Report. The Vicksburg District took all substantive comments on the DSEIS, appendixes, and Draft Report into account in the analyses performed in the preparation of the final document. The Vicksburg District received technical assistance from Mississippi State University, Louisiana State University, EPA, ERDC, FWS, NRCS, MDEQ, MDWFP, and other USACE Districts in preparation of the Final Report.

b. Comment. What is the dollar cost of the pump per acre, per farm and per person in actual harm's way, within each reach and the 2-year return frequency flood of 121,000 acres compared to protection without the pump?

Response. The Vicksburg District's economic analysis and BCR were conducted in accordance with USACE's Principles and Guidelines (ER 1105-2-100). No calculations were performed on cost per acre, per farm, or per person in the study area.

c. Comment. The project cost is $181,595,000 based on February 2000 prices and the next stated cost of the project is $207,178,000. Adding the yearly maintenance costs of $995,000 for 50 years brings the total cost over time to $256,928,000.

Response. The revised project cost in the Final Report is $220 million. Gross investment is $231.6 million. Gross investment is defined as the total project first cost plus interest during construction. The fully funded cost estimate for the recommended plan is $251.9 million. This represents the first cost of the project plus contingencies and escalation (inflation) over the life of the project (50 years). Maintenance costs are in the form of annual costs, whereas project costs relate to total project implementation costs. The annualized project costs are needed before it can be compared with all annual costs to make a valid cost comparison. The operation and maintenance costs are $1.2 million annually. The annual cost is $15.1 million with a BCR of 1.4:1.

d. Comment. The land involved is marginal land so why not buy the property rather than build the very expensive pump.

Response. The recommended plan provides flood protection to 316,000 acres of agricultural land. Using a conservative estimate of $1,200 per acre, the cost of purchasing the area would be $379 million. The price of the recommended plan is 42 percent less. The purchase of the land does not include the price to reforest, improve, or provide annual management. Purchasing agricultural property does not fully address the objectives of the study because it does not provide flood damage reduction to residences or other structures. It is not supported by the project sponsor and residents of the area.

e. Comment. Why do we want the continued expense of a pump to protect a few farmers on marginal land?

Response. See responses 2a and 3d.

f. Comment. There is no rational way this project can be justified.

Response. Based upon The Economic and Environmental Principles for Water and Related Land Resources Implementation Studies and The Economic and Environmental Guidelines for Water and Related Land Resources Implementation Studies, ER 1105-2-100, dated 22 April 2000, regulations that authorize the U.S. Army Corps of Engineers to complete Civil Works water resources projects, including flood damage reduction and ecosystem restoration, the recommended alternative is justified economically with a BCR of 1.4:1. In addition, this balanced project meets the needs of the region and provides significant environmental benefits.

g. Comment. How can the Corps predict costs of 50 years?

Response. During the study process, estimated total first costs are developed to determine average annual costs, which are compared to average annual benefits, in establishing potential feasibility of each proposed alternative plan of improvement. To achieve a common time basis

for comparing project costs and benefits, they are converted to an equivalent basis (i.e., annualized) in compliance with Federal regulations set forth in USACE Principles and Guidelines.

Total project first costs are computed utilizing cost estimates for construction; real estate (i.e., lands and damages); relocations; planning, engineering, and design; and construction management (including contingencies) for each alternative. In accordance with ER 1105-2-100 and prescribed procedures for cost estimating or cost accounting requirements, interest during construction is calculated on expenditures incurred during the construction period for each alternative. The summation of project first costs and interest during construction results in total (or gross) project investment costs, which are amortized over the life of the project to develop average annual costs utilizing the current Federal discount rate. Other annual costs, which accrue yearly for each alternative, are also included to achieve total annual costs. Examples of these are operation and maintenance costs (O&M), rehabilitation costs, mitigation costs, etc. Based on USACE guidelines, these costs are not projected into the future.

In compliance with USACE procedures for conducting the standard economic analysis, total annual costs are then compared to total annual benefits to determine project feasibility. If project benefits are projected to increase into the future over the project life (e.g., agricultural benefits in the Yazoo Backwater study), they are also discounted back to an annual basis. Results of the standard economic analysis are presented in terms of benefit-cost ratios and excess benefits over costs, the latter being the primary determinant in identifying the NED Plan (i.e., the plan that maximizes the greatest excess benefits as compared to the costs). For the Yazoo Backwater Reformulation Study, in accordance with ER 1165-2-28, environmental considerations were also addressed in detail, and various environmental features were included in the proposed alternatives. Thus, the selection of a recommended plan was based on the best balance between economic and environmental benefits to the area.

After selection of a recommended plan, detailed costs are generated based on cost estimating guidelines outlined in EC 1110-2-538. These detailed costs, which are fully-funded, represent total project first costs with escalation (i.e., inflation) over the life of the project.

For the Yazoo Backwater Reformulation Study, benefits and costs were annualized utilizing the current Federal interest rate of 5-1/8 percent and a project economic life of 50 years.

h. Comment. Is the Corps trying to protect agricultural land from a 100-year flood by building the pump?

Response. Operation of the pump station provides flood damage reduction benefits to lands between the 1- and 100-year frequency flood event. The project will reduce the frequency and duration of floods, but residual flood damages still occur, even with the pump station in place. The recommended plan's implementation would reduce the 100-year flood elevation approximately 4 to 4.5 feet.

i. Comment. The Mississippi River needs somewhere to go.

Response. The Yazoo Backwater project will not impact the Mississippi River since the existing backwater levee and Steele Bayou and Little Sunflower structures already prevent backwater from the Mississippi River from entering the study area.

j. Comment. What is the cost per farm for this project?

Response. See response 10b.

k. Comment. Volume 3, Table 4-27, page 79 in Shabman's extended report says total damage is $38,607,000 for a 100-year flood on only 1,544 structures using Corps figures. How does it make sense to build a pump for $200,000,000 plus dollars?

Response. The costs in Table 4-27 do not reflect the value of the land and infrastructure, which would far exceed the cost of the project. The recommended plan evaluated the flood protection needs of the entire study area, not just the structures residing within the 100-year flood plain. The project provides additional benefits to agricultural crop, noncrop, automobiles, roads, bridges, flood insurance, etc.

11. Letter, Mississippi Wildlife Federation, 7 December 2000. (Exhibit 4A-11)

a. Comment. The FCA of 1941 dedicated the lands below elevation 90 to flood control storage.

Response. The Flood Control Act, Public Law 228-77th Congress, approved Plan C for the control of flooding in the lower Mississippi Delta. That plan, found in House Document 359, provided for the construction of three pumping plants with a combined capacity of 14,000 cubic feet per second (cfs). The pump station would be operated in such a way that the impounded drainage would not rise above the 90 foot mean Gulf level contour more frequently than once in 5 years on average. The recommended plan achieves this goal.

b. Comment. There are less expensive and less invasive means to help the people of the Delta.

Response. In selecting a balanced alternative with structural and nonstructural flood damage reduction features, approximately one-third of the cost is land acquisition, reforestation, and conservation. The Vicksburg District participated in 3 years of meetings with stakeholders and environmental groups in a consensus building process. The meetings helped develop an array of alternatives that included both structural and nonstructural features. The recommended plan meets the needs of the environment and of the Delta's residents. This is a balanced plan that meets the environmental and economic needs in this region.

c. Comment. The DEIS is deficient since the baseline environmental ecology of the system is not adequately defined nor documented and the potential impact upon the baseline ecology thus is not accurately nor adequately considered and elucidated.

Response. The final Supplemental Environmental Impact Statement (FSEIS) and technical appendixes define the baseline environmental conditions of the study area. Environmental impacts for each alternative in the final array are measured against the baseline environmental conditions for each evaluated resource.

d. Comment. Benefits of the potential and real benefits of the area must be factored into an analysis of the proposed project.

Response. The functional evaluations of natural resources addressed in the FSEIS focused on the changes in hydraulic regime projected for the project (i.e., the Vicksburg District looked carefully at how the environment would respond to the flood damage reduction of pump station operation). With respect to economic evaluations, the USACE policy is to evaluate alternatives using NED benefit categories and to select the alternative that has the greatest excess economic benefits when compared to costs. In the case of the recommended plan for the Yazoo Backwater project, the Vicksburg District considered additional environmental benefits and selected an alternative that balanced economic and environmental needs of the study area. The selected alternative in this case did not have the greatest excess economic benefits when compared to costs. Based upon The Economic and Environmental Principles for Water and Related Land Resources Implementation Studies and The Economic and Environmental Guidelines for Water and Related Land Resources Implementation Studies, Engineer Regulation 1105-2-100, dated 22 April 2000, regulations that authorize the U.S. Army Corps of Engineers to complete Civil Works water resources projects, the recommended plan is justified economically with a BCR of 1.4:1 and is environmentally sustainable.

e. Comment. A thorough analysis of the changes in reforestation and landowner participation is needed.

Response. The Final Report includes a revised land-use analysis which was based on 2005 land-use conditions, including the latest available spatial coverages of Wetlands Reserve Program (WRP) and Conservation Reserve Program (CRP) provided by USDA. Also included in the Final Report is an analysis that takes into account the changes and trends that have occurred in land-use patterns in the lower Mississippi Delta over the past few years. According to the USDA Farm Service Agency, the WRP acreage caps for Sharkey and Issaquena Counties have been reached. By law, only 25 percent of the agricultural lands within a county can be enrolled in these conservation programs, with no more than 10 percent of the county in the WRP.

f. Comment. There is not 62,500 acres of land available below the 87 ft. elevation.

Response. The 87-foot, NGVD, elevation is the reference elevation at the Steele Bayou structure that equates to the 1-year frequency flood. Based on 2005 land-use data, there are 42,800 cleared acres available in the 1-year frequency flood plain. However, based upon sound real estate practices and guidance as found in USACE real estate regulations, blocking out will be utilized to address such items as access, the extent of severance damages, and avoidance of an uneconomic remainder. The 30 percent blocking factor will result in the acquisition of some lands outside the 1-year flood plain. Therefore, up to 55,600 acres will be acquired for reforestation. Prior to pump station operation, the Vicksburg District will acquire 15,029 acres of easement lands in order to achieve no net loss of environmental resources. Acquisition of the remaining easements will continue for 10 years after construction of pump station is completed.

g. Comment. The Corps is behind 28,000 acres in mitigation.

Response. Several projects under construction by the Vicksburg District do require compensatory mitigation; however, the Vicksburg District's mitigation acquisition is concurrent with construction. The Vicksburg District is committed to fulfilling all of its authorized mitigation requirements. Lands acquired for mitigation by the Vicksburg District are from willing sellers and must meet certain environmental criteria such as use as a moist soil area or frequency of flooding prior to purchase. A table is included in Appendix 1 showing the status of acquisition of mitigation land by the Vicksburg District.

h. Comment. FCA of 1941 authorizes flood control protection down to elevation 90 not below and there is not significant damage to structures below elevation 91 feet.

Response. The Flood Control Act, Public Law 228-77th Congress, approved Plan C for the control of flooding in the lower Mississippi Delta. That plan, found in House Document 359, provided for the construction of three pumping plants with a combined capacity of 14,000 cfs. The pumps would be operated in such a way that the impounded drainage would not rise above the 90-foot, mean Gulf, level contour more frequently than once in 5 years on average. The recommended plan achieves this goal. There is flood damage to structures below elevation 91.0 feet, NGVD.

i. Comment. We disagree with the Corps statement that there will be little impact on the Pondberry. Instead we believe the Corps should enter into formal consultation with the U.S. Fish and Wildlife Service regarding the potential threat to the Pondberry if pumps are erected and function.

Response. The Vicksburg District completed formal consultation with FWS regarding the endangered plant pondberry. The FWS did not concur that the project was not likely to adversely affect pondberry. However, FWS determined that the project will not jeopardize the continued existence of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

j. Comment. The flaws in methodology that were identified by an independent review of the Upper Mississippi Navigation Project would dictate the need for a similar third party review of the Yazoo Backwater methodology.

Response. USACE policy requires an Independent Technical Review (ITR) for feasibility studies. This review must be conducted by another USACE District. The ITR for this project was completed by personnel from multiple USACE Districts during 2006. The environmental appendixes were updated based on comments to the 2000 Draft Report. These revised environmental appendixes were reviewed and commented on by EPA; FWS; Mississippi Department of Environmental Quality; and the Mississippi Department of Wildlife, Fisheries and Parks (MDWFP).

k. Comment. Science based peer agencies USFWS and EPA have taken exception to the Corps analysis of the Backwater Area and were ignored as well as the public's desire to use nonstructural measures instead.

Response. The Vicksburg District considered all public comments, as well as comments from FWS and EPA. The FSEIS carries through and addresses proposals for a no action alternative, four nonstructural alternatives, one structural alternative, and four combined structural and nonstructural alternatives. These alternatives were based on interagency and public coordination and comments, even though many of these alternatives do not meet applicable economic standards for positive BCR.

12. Letter, Ducks Unlimited Inc., 26 October 2000. (Exhibit 4A-12)

a. Comment. The plan does not have the appropriate balance of structural and nonstructural flood control features.

Response. The Final Report includes a no-action alternative, four nonstructural alternatives, one structural alternative, and four combination alternatives to address the needs of the Yazoo Backwater Study Area. The recommended plan (Alternative 5) is a combined structural and nonstructural alternative selected for its balance of environmental benefits (reforestation and conservation) with flood damage reduction (pump station and reforestation). The Vicksburg District selected Alternative 5, even though Alternative 4 qualified as the NED Plan. Deviation from the NED was justified by the environmental benefits and cost of the environmental benefits provided by Alternative 5.

b. Comment. The recommended plan does not adequately measure or duly consider the potential positive environmental benefits that could accrue from other options in the report that called for reforestation of open lands and initiation of pumping at higher elevations.

Response. The final array of alternatives includes a no action, four nonstructural, one structural, and four combination alternatives to address the needs of the Yazoo Backwater Area. The environmental impacts and benefits for each of the alternatives are displayed in the Final Report and FSEIS. Included in this analysis are alternatives that evaluate reforestation of agricultural lands and initiation of pumping at higher elevations.

c. Comment. The Corps analysis falls short by failing to develop and/or apply techniques to assess and include (1) the ecosystem benefits of carbon sequestration; (2) ecosystem benefits to water quality improvements; and (3) economic value of carbon credits. We believe that with reasonable assessment of these values, Plans 9 or 21 in the Second Array of Alternatives, or Plans 14 or 26 from the Third Array, or Plans 2 or 7 from the Final Array could be justified and provide far more significant environmental and economic outputs than the recommended option.

Response. Currently, the emerging markets in carbon credit, including carbon sequestration in forestry, are not developed to a point that they can be considered as commodities with proven markets. While EPA has water quality trading policies, these have not evolved to a maturity to allow water quality to be considered as a commodity with a proven market. Current USACE policy does not allow for inclusion of these benefit categories in economic justification of proposed projects. The guidance (USACE HQ memorandum dated 26 June 2001) states that proven markets for carbon sequestration and nitrogen reduction must exist before benefits can be used for justification. Research efforts designed to identify other methods of sequestering carbon

and reducing sediment runoff, such as no-till farming and filter strips, must be evaluated before they can be used to quantify improvements in water quality. While the revised Water Quality Analysis used the Hydrogeomorphic (HGM) wetland assessment to evaluate wetland capacity to remove nutrients for each of the alternative plans, without proven markets, water quality benefits cannot be used in the economic justification of any alternative.

d. Comment (Page 3, No. 1). We believe the Corps analysis falls short by failing to include benefits based upon a reasonable or even conservative projection of future WRP or CRP enrollment during the life of this project.

Response. See comment 11e.

e. Comment (Page 3, No. 2). The Corps does not have sufficient time to acquire the total proposed easements prior to the deadline of one year after construction is completed.

Response. Based on comments received on the Draft Report, the Vicksburg District extended the acquisition period for easements from 1 year in the Draft Report to 10 years in the Final Report after construction is physically complete (4 years of pump station construction). Acquisition of easements would last 14 years. At the end of this 14-year period, the Vicksburg District will decide if additional time for easement acquisition is warranted.

f. Comment (Page 4, No. 3). The Corps has written "in order to achieve the level of protection projected by the recommended plan, it is anticipated that some of the pumps would have to be turned on prior to stages reaching 87.0 feet, NGVD."

Response. The pump station consists of 12 individual pumps. In order to get the full pump station capacity, engineers bring the pumps online in increments. Full pump station capacity is not immediate as simulated in the mathematical models. The target start pump elevation is 87.0 feet, NGVD, for normal inflow conditions or whenever the Steele Bayou structure has to be closed at some higher elevation. However, in some extreme cases where very large rainfall events occur, flood forecasts, which show inflows exceeding 14,000 cfs, will be used to determine if pumps need to be brought on line at stages slightly less than elevation 87.0 feet, NGVD, to ensure full station capacity as soon as possible. All large pump stations are staged in order to get full capacity when it is needed. Pumping would cease incrementally as well, when interior ponding levels recede to near elevation 87.0 feet, NGVD, or when the Steele Bayou structure floodgates can be operated with gravity flow. The pump station is designed to operate efficiently and without damage to the pumps and engines down to elevation 86.0 feet, NGVD. Operating the pump station below this elevation is outside the design requirements for the pumping units and would damage the diesel engines and/or pumps.

g. Comment. The Corps needs to revisit its economic analysis and include Carbon sequestration, water quality improvements and other important aspects to help justify real tangible measures.

Response. See response 12c.

h. Comment (Page 4). The Corps is remiss in their evaluation of cumulative impacts.

Response. An evaluation of cumulative effects is contained in the FSEIS. The evaluation is broad enough for reviewers to determine the significance of various past, present, and future actions in the project region. A quantitative cumulative impact assessment between the Big Sunflower River Maintenance Project and the Yazoo Backwater Project has been added to the Terrestrial, Waterfowl, Wetland, Aquatic, and Water Quality Appendixes.

13. Letter, Barry Kohl, 2 December 2000. (Exhibit 4A-13)

(General Response to comments: Appendix 16 has been revised since the 2000 draft to address these and other comments.)

a. Comment. According to Sec. 16, p. 21 of the Draft EIS for the Yazoo Pumps: "An additional 25 segmented core samples were collected from the Little Sunflower Basin in 1998 and 1999. A statistical analysis of pesticide concentration with depth found no significant differences with depth." This statement is false and misleading. The raw data presented in the USACE, Feb. 2000 report show that TDDT increases with depth in the majority of cores. The mean values presented by the Corps in the Report also show an increase in TDDT at depth.

Response. The statement was neither false nor misleading. The Vicksburg District utilized accepted statistical procedures to determine significance. In the revised Water Quality Analysis (Appendix 16), the discussion of YBWP sediments was limited to the discussion of surface sediments since the YBWP does not involve dredging other than possible infrequent maintenance of areas near the inlet and outlet of the pump station.

b. Comment. Who was the preparer of the Water Quality Appendix?

Response. A list of preparers is provided in the FSEIS.

c. Comment. Why weren't raw data tables included?

Response. To meet the goals of size and readable documents, the Vicksburg District does not include in the FSEIS the vast amount of data on which it relies. The Vicksburg District makes the raw data available to anyone upon written request.

d. Comment. Why weren't detection limits for analyses included?

Response. The data summary tables were revised to include maximum detection limits for those parameters having no samples with detectable results.

e. Comment. Paragraphs are numbered twice – p.16-47 repeats the numbering system.

Response. Comment acknowledged. Numbering will be corrected in the final SEIS.

f. Comment, Para. 21. This is a discussion of surface sediments. "Surface" should be added for clarity.

Response. Comment acknowledged.

g. Comment, Para. 22. What are the detection limits for metals and pesticides? Those numbers need to be added.

Response. See the response to comment 13d.

h. Comment, Para. 23. How were the sites selected in the Steele Bayou basin? Why weren't cores taken further downstream? Four cores are not enough to determine the contaminant trend in Steele Bayou. There should be more. Raw data for the cores should be included in a table. Data from several core layers are excluded in the figures. Two core layers are omitted for SL-5 in Fig. 16-5 and 4 core layers omitted from Fig. 16-4. Were the levels of DDE and TDDT below detection? If so, what is the detection limit?

Response. The sediment data from the Steele Bayou Basin were collected as part of the Upper Steele Bayou Reformulation study. The cores were from the Steele Bayou project area. The number of cores was adequate to characterize the sediments, as there was no discussion of pesticide concentrations with sediment depth at that time. During revision of Appendix 16 , it was determined that a discussion of sediment core data was inappropriate for the sediment analysis since the YBWP does not involve dredging other than infrequent maintenance of areas near the inlet and outlet of the pump station. The revised sediment discussion addresses surface sediments only.

i. Comment, Para. 24. There should be detection limits listed for all the priority pollutant pesticides included in Table 16-3.

Response. See comment 13d.

j. Comment, P. 24. I agree that it is difficult to draw conclusions from only 4 cores. Why weren't more cores taken to establish a trend? Why not include the TDDT, DDE data from the sediment cores taken in the Little Sunflower River and add those to the graphs.

Response. Sediment core data were not evaluated in the revised Appendix 16 because the YBWP does not involve dredging other than infrequent maintenance of areas near the inlet and outlet of the pump station. The analysis includes all available data (surface sediment and water quality) from Steele Bayou, Deer Creek, the Big Sunflower River Basin, and the Backwater Lakes inside Delta National Forest.

k. Comment, P. 24. A statement cannot be made rationally that TDDT decreases in the deeper layers. The cores from the Little Sunflower, analyzed by the USACE, show a definite increase in TDDT with depth (see attached figures). The statement that a "statistical analysis of pesticide concentration with depth found no significant differences with depth." is flawed. TDDT increased in the cores with depth, based on the Corps' own data. The statement about the Little Sunflower cores is misleading and false and does not represent the facts based on evaluation of the raw data presented by the Corps in the Big Sunflower Water Quality Monitoring Plan (USACE Feb., 2000). The raw 1998 & 1999 core data should be included as a table in the EIS for comparison.

Response. As mentioned in previous responses, Appendix 16 no longer includes a discussion of sediment core data since the project does not involve dredging other than infrequent maintenance of areas near the inlet and outlet of the pump station. However, the significance of the apparent differences observed in the 2000 document was tested with an analysis of variance (ANOVA) procedure. The results of the ANOVA found no significant differences between the mean of samples collected from different depths. The results were significant to the 99.99 percent level. Any single core is just a representative of the whole and is an estimate of the TDDT levels for that discrete sample. Only with statistics can you make meaningful statements about the nature of the sediments as a whole. The statements in the report are neither false nor misleading. The core data collected for the Big Sunflower O&M Project are reported in the document for that study and do not belong in this project's FSEIS. Sediment core data will be thoroughly discussed in the Big Sunflower O&M Project water quality analysis where inclusion is applicable to that project.

l. Comment, Para. 25. The Bowen (1966) concentrations of metals occurring in the earth's crust have been replaced by newer data. See Wedenpohl (1991). Also include the reference for the USGS citation in the reference section.

Response. The revised Appendix 16 references concentrations of metals in the eastern United States (Shacklette, H. T., and Boerngen, J. G., 1984) and the MDEQ/USGS geochemical values for stream sediment and soil samples in Mississippi (Thompson, D. E., Grosz, A. E., Schruben, P. G., and Grossman, J. N., 2002).

m. Comment, Para. 26. Include the reference for the USGS citation.

Response. References are included in Appendix 16.

n. Comment, Para. 27. Raw data should be added as a table for comparison of data. Detection limits should be included. Are the values in dry or wet weights? How long were the sediment samples stored before analysis?

Response. The comments regarding the raw data and the detection limits have been answered previously. The concentration values for the sediment samples are in dry weight. The EPA holding time for sediment metals analysis is 6 months. Sediment analysis met recommended EPA holding times.

o. Comment, Para. 37. The background level for mercury in the earth's crust is 0.02 ppm average according to Wedenpohl (1991). The DEIS author speculates that: "it is unlikely that aquatic organisms will be susceptible to trace metals in the range of concentrations that they occur naturally." This is a stupid statement, which is not supported by any scientific data. First, neither the Corps nor the USGS has determined what the normal background level of trace metals are in the Yazoo basin. You can't use an average for the earth's crust as a benchmark for judging the impact on organisms in one single watershed! The ER-L and ER-M are based on scientific observations under laboratory conditions and not on speculation.

Response. In the revised Appendix 16, sediment metals data were compared to the 2002 EPA freshwater sediment quality guidelines. These consensus-based guidelines were used to compare probable toxic effects from metals in sediment based on their interaction with the water column and aquatic biota. The threshold effect concentration (TEC) represents concentrations of a compound in sediment below which adverse biological effects are unlikely to occur. The probable effect concentration (PEC) represents concentrations of a compound in sediment above which harmful effects are more likely to be observed. The range between the TEC and the PEC represents a range of concentrations of compounds in which the link between concentration and adverse biological effects is less certain.

p. Comment, Para. 38. The statements are speculative. What scientific resources does the author have to support his/her statements? The benchmarks ER-L, ER-M cannot be compared to averages in the earth's crust. The trace elements change in concentration based on the types of rocks/strata occurring in the area. It is true that trace elements can act synergistically. The effect of several contaminants may be more toxic in the sediment than each one individually. The effects range, determined by NOAA, used spiked concentrations of single trace elements to determine toxicity to test organisms.

Response. The 2000 Draft Appendix 16 cites several articles that evaluate the accuracy and effectiveness of the NOAA benchmarks. Appendix 16 was revised and now uses EPA sediment quality guidelines (TEC and PEC) in its analysis of sediment data.

q. Comment, Para. 39. There should be (a) table with the raw fish-tissue data available for comparison. It is important to know the values of contaminants by fish size, species and location. The locations (stations) should be included on the base map for the project to compare fish stations with sediment sampling stations.

Response. See response to comment 13c. Fish size, species, and location are provided in Table 16-15 of the revised Appendix 16.

r. Comment, Para. 41. Raw data for pesticides in fish should be included in the EIS.

Response. See response to comment 13c.

s. Comment, Para. 42. Raw data for trace metals in fish should be included in the EIS. Certain individual fish samples are discussed but there is no mention which sample or which species the author is discussing. Table 16-8 should be supplemented by a raw data table so that the reader knows the level of metal concentration in each species by size and location.

Response. The raw data are available upon written request.

t. Comment, Para. 43. The screening level (level of concern) for mercury in fish for Mississippi is 0.75 ppm according to MDEQ personnel. Any fish over the 1.0 ppm FDA maximum would be excluded from interstate commerce.

Response. The most recent Mississippi Water Quality Assessment (2006) lists the level of concern for mercury as 1.0 ppm, and the state has not informed the Vicksburg District of any changes in its screening level.

u. Comment, Para. 20a. If DDT is "indeed this toxic there should be some clinical evidence of that in the medical records." Unfortunately there probably has not been blood sampling for TDDT or mercury in the Yazoo Basin. Usually doctors are unaware of the clinical symptoms resulting from metal or pesticide toxicity.

Response. Comment noted. This discussion has been removed from Appendix 16. The Vicksburg District has no information concerning clinical evidence of DDT from medical records.

v. Comment, P. 21a. Another of the project impacts is the dredging of the Big Sunflower and tributaries, which is an integral part of the Yazoo Backwater Area Project. The dredging will cause resuspension and redistribution of toxic sediments which have been documented as part of the Big Sunflower EIS and the USACE report (Feb. 2000). The 220 acres in the immediate vicinity of the pump plant is only a small fraction of the acreage to be impacted by this project.

All the feeder streams will be dredged or snagged increasing the erosion in the rivers and banks as well as the direct resuspension of contaminated sediments and exposure of more contaminated sediments at depth in the river bed. Ninety-seven miles of streams (FEIS Big Sunflower) will be dredged by dragline or hydraulic dredge resuspending sediments contaminated by TDDT. This will cause additional downstream contamination by TDDT and probable bioaccumulation in the fish.

The project has also included the clear cutting of trees along the Bogue Phalia and Holly Bluff cutoff, which will increase erosion, and introduction of contaminated soils into the river system.

Response. The Big Sunflower River Maintenance Project is a separate project with a separate evaluation, but was considered under the cumulative impacts analysis for the Yazoo Backwater project.

w. Comment, P. 23a. A study of mercury on the Ouachita River in Louisiana (Arkansas) is alluded to, but there are no data produced or a reference to the work. Based on the lack of information included in the EIS, we can only discount the information as being anecdotal. Where are the sampling stations? What is the frequency of sediment collection and analysis?

Response. Four years of methyl mercury water analysis from Felsenthal NWR (Figure 16-20) are presented in the revised Water Quality Analysis in a comparison of methyl mercury concentrations in the Ouachita River to concentrations in Delta National Forest in the YBWP Area. Data from the YBWP Area are presented in Appendix 16 (Table 16-30).

x. Comment, Para. 23a. For the hypothesis to be proven, one must compare the chemical parameters in both basins and see if there is a close correspondence. A similar mercury study in the Yazoo Basin should be undertaken to directly compare the results with the Ouachita River. There will always be some differences in the biologic systems and levels or differences in mercury compounds, pH, sulfate availability etc. Studies have shown that the pH of water from Steele Bayou, Big Sunflower, and Backwater Lakes (Table 16-2) show a mean pH of about 7.0 for these water bodies. This is much higher than the acidic waters needed to initiate methylation.

Response. Appendix 16 has a section on methyl mercury discussing available data and possible impacts to water quality within the project area.

y. Comment, Para. 23a. The public health effects of TDDT in fish in the Sunflower Basin is more a concern. Why isn't the Corps considering the proposed dredging of the contaminated river sediment a direct impact to bioaccumulation of TDDT in fish?

Response. The YBWP does not involve dredging other than infrequent maintenance of areas near the inlet and outlet of the pump station. Maintenance dredging may be necessary once or twice during the 50-year life of the project, depending upon deposition rates in these channels.

z. Comment, Para. 24a. The Corp's presentation is speculative and unsupported by data. One could also weave a story that the TDDT in sediments could increase the bioaccumulation in fish by reforestation/or deforestation.

Response. The discussion of project impacts in Appendix 16 has undergone revision since the 2000 draft EIS. The revised document relies on extensive scientific studies to support the analyses and conclusions. Discussions of fate and transport of contaminants, including TDDT, are based upon best available science. A major component of Appendix 16 is the discussion on possible project impacts on the impaired waters of the state. Reforestation will reduce TDDT through erosion control and through increased wetland filtration.

aa. Comment, Para. 26a. Heavy metals and pesticides are hydrophobic and one would expect a higher level in the sediments than the water column. The hydrophobic chemicals settle out of the water column and collect on the river bottom sorbed to fine grained sediments and colloids.

Response. The Vicksburg District agrees these compounds are typically associated with sediments and organic matter rather than dissolved in water. Because of this characteristic, the revised Appendix 16 carefully evaluated the potential impact of the project in terms of the duration of floodwater in relation to duration needed for settling of sorbed hydrophobic chemicals.

bb. Comment, Para. 26a. The levels of TDDT in sediment cores are presently high in the Little Sunflower River (see USACE 2/00 report). Twenty-five years ago, there was not an extensive database of cores in the rivers giving us a baseline in which to compare. This is a speculative statement unsupported by facts.

Response. Appendix 16 cites several reports on pesticide levels in water, sediment, and fish tissue. These reports were published 25 to 30 years ago.

cc. Comment, Para. 26a. There are no data to support the contention that levels of TDDT in cores now are significantly lower than they were 25 years ago. In fact the high levels of TDDT from 30 years ago may still be buried at depth in the project area. The Little Sunflower cores support a down core increase in TDDT.

Response. While the cited paragraph makes no mention of pesticide concentration with core depth, this comment no longer applies to the content of Appendix 16 since all discussion of sediment cores was removed. This was done because the YBWP does not include dredging other than infrequent maintenance of areas near the inlet and outlet of the pump station.

dd. Comment, Para. 27a. The statement "Conversion of cropland to forestland will likely increase the amount of methyl-mercury produced and could lead to increase mercury in fish-tissue." This statement is speculative and not supported by facts.

Response. The concept that conversion of cropland to forest land will likely increase the amount of methyl mercury produced and could lead to increases in mercury in fish tissue is not speculative, but is a remote possibility. However, it is a possibility that the Vicksburg District was obligated to explore since data collected in the Ouachita River at Felsenthal NWR show a distinct trend of increased methyl mercury concentration with pool elevation each year. The revised Water Quality Analysis has a section on methyl mercury that explores this possible impact of reforestation of frequently flooded land and includes methyl mercury data collected in the Delta National Forest. The section also presents research findings published in peer reviewed journals.

14. Letter, Delta Land Trust, 8 December 2000. (Exhibit 4A-14)

a. Comment. The DEIS does not adequately consider impact of pumps on downstream water quality. Since contaminant-laden silt will be pumped through pumps instead of allowing the silt to settle and somewhat cleanse, said water quality will be detrimentally affected.

Response. The Yazoo Backwater project will not increase sediment, pesticide, or nutrient loading within the study area. The same water will be discharged into the Yazoo and Mississippi Rivers--only the timing of the discharge will change. The Vicksburg District carefully evaluated the settling capacity of backwater areas and found that the flood duration reduction benefits of the project would not interfere with the duration needed to assure adequate settling of sediments from the water column. The nonstructural reforestation/conservation features will reduce erosion and the nonpoint source runoff of sediment and the agricultural chemicals attached to those sediments (i.e., pesticides and nutrients). In addition, reforestation of agricultural lands will improve the wetland functions associated with sediment, pesticide, and nutrient removal on those lands. Overall, the project should reduce the amount of agricultural chemicals and sediment entering the Yazoo and Mississippi Rivers. The maximum discharge of 14,000 cfs from the pump station is approximately 1 percent of the total flow (1.1 million cfs) in the Mississippi River at the pump start elevation of 87.0 feet, NGVD.

b. Comment. DEIS does not adequately consider impact of pumps on global warming. Pumps use electricity created by burning of fossil fuels, which leads to increased CO2 emissions and greenhouse effects, which cause global warming. Agricultural intensification is a stated goal of the Pumps, yet the global warming effect of ag intensification is not addresses in the DEIS.

Response. Reduction of agricultural intensification is a stated goal of the YBWP. The carbon sequestered and the reduction of agricultural operations on the lands associated with the nonstructural feature will more than offset any C02 emissions from the pump station.

c. Comment. DEIS does not adequately consider non-structural alternative of buying flowage easements and planting trees throughout the study area. The Corps treatment of this subject in the DEIS is a joke.

Response. The Vicksburg District equally considered all structural and nonstructural alternatives. The final array included a no action, four nonstructural, one structural, and four combination alternatives. All of the alternatives, except for the structural alternative, included a reforestation component. These alternatives included nonstructural alternatives proposed by EPA and FWS. The Vicksburg District used the same procedures to evaluate all the alternatives. Several of the previous arrays of alternatives evaluated flowage easements and reforestation.

d. Comment. DEIS does not adequately consider Big Sunflower River Maintenance Project as a feature of the Yazoo Pumps Project.

Response. The Big Sunflower River Maintenance Project is a separate project and will be separately evaluated. Since the study areas for both projects overlap, cumulative impacts of both projects have been addressed in the Yazoo Backwater project's FSEIS.

e. Comments. DEIS does not acknowledge that it was Corps, not Congress, whom modified the original 3 small pump plan specified in the Flood Control Act of 1941 in favor of channeling the combined flow of the Big Sunflower River, the Little Sunflower River and Deer Creek to Steele Bayou via the Corps Constructed Sunflower-Steele Bayou Connecting Channel and subsequently proposing to build one mammoth pumping plant at Steele Bayou Control Structure and DEIS does not adequately recognize the Sump areas that were features of earlier versions of the Pumps Project.

Response. The 1941 Flood Control Act, Public Law 228, 77th Congress, approved Plan C for the control of flooding in the lower Mississippi Delta. That plan, found in House Document 359, provided for the construction of three pumping plants with a combined capacity of 14,000 cfs. The pumps would be operated in such a way that the impounded drainage would not rise above the 90 foot, mean Gulf level contour, more frequently than once in 5 years on the average. The Act contained a grant of discretion to the Chief of Engineers to make certain modifications to the project plan. The recommended plan achieves this goal.

The Committee on Public Works of the U.S. Senate on 12 June 1954 adopted a resolution calling on the Chief of Engineers to "examine and review the project for flood control of the Mississippi River in its alluvial valley as authorized by the Flood Control Act approved 15 May 1928, as amended by subsequent Acts of Congress, as one comprehensive whole and in its entirety, and to submit at the earliest practicable date recommendations for any modifications that are advisable with respect to the project or any feature of the project." In response, and in accordance with instructions from the Chief of Engineers, the Vicksburg District created a document that became Annex L to the Comprehensive Review. The Annex puts forward a plan to connect the Sunflower and Steele Bayou sumps by a channel. The Vicksburg plan assumed a minimum sump elevation of 82.5 feet, NGVD, to provide recreational benefits.

The Comprehensive Review of the Mississippi River and Tributaries Project Report (published as HD 308, 88th Congress, 2d Session) adopted most of the recommendations for the Vicksburg District, concurring that the project would best function if the Steele Bayou and Sunflower River sumps were connected by a channel. The Flood Control Act of 1965 further modified and expanded the project for flood control and improvement of the lower Mississippi River to include the projects and plans substantially as recommended by the Chief of Engineers in House Documents 308 and 319.

f. Comment. DEIS does not adequately recognize that the dominant trend in land use is the YBWA is away from agricultural intensification in favor of reforestation.

Response. The FSEIS has been revised to reflect the conversion of agricultural land to forest.

g. Comment. DEIS does not adequately consider effects of Pumps effluent on downstream landowners, including on lands owned by the Trust in fee and via conservation easement that lie just to the south and east of the proposed Pumping Plant.

Response. The FEIS and Appendixes 6 (Engineering) and 16 (Water Quality) evaluate potential impacts downstream (Yazoo and Mississippi Rivers) of the pump station.

h. Comment. DEIS does not adequately recognize the implicit and explicit subsidy payments in the commodity prices used in its benefits and costs analysis.

Response. Guideline II Current Normalized Commodity Prices for use by Federal agencies in water and related land resources planning, as required by rules implementing the Water Resources Planning Act of 1965, include government subsidy payments.

i. Comment. DEIS does not adequately consider the effects of Pumps on endangered pondberry, threatened wood stork, endangered Florida panther, threatened Louisiana black bear or threatened red wolf amongst many species of flora and fauna resident in the area.

Response. Both the Vicksburg District and FWS identified only the endangered plant pondberry and the threatened Louisiana black bear as species that may occur in the study area. Pursuant to Section 7 of the Endangered Species Act, a Biological Assessment (BA) was prepared. (See Appendix 14.) The BA concluded that the recommended plan was not likely to adversely affect either species. The FWS concurred with the Vicksburg District determination that the project is not likely to adversely affect the Louisiana black bear. While FWS did not concur with the Vicksburg District determination that the project will not likely adversely affect pondberry, they did conclude that the project would not jeopardize the continued existence of pondberry. The nonstructural feature of the project will provide up to 55,600 acres of forested habitat for these species. Additionally, the Vicksburg District, in conjunction with the U.S. Forest Service and FWS, is conducting research on the requirements of the endangered plant species pondberry. The research would support the recovery plan for the species. In 2007, the Vicksburg District and FWS signed a Memorandum of Agreement to establish two new pondberry populations in the project area and conduct additional field experiments evaluating the effects on flooding, stand thinning, competition, and pathogens on pondberry.

j. Comment. DEIS does not adequately consider the massive amount of channelization, ditching and other flood control infrastructure work that will be necessary in order for the Pumps to work as projected.

Response. All anticipated impacts due to the construction of the pump structure have been presented in this report. The infrastructure work necessary will be limited to the original site that was acquired and cleared in 1986. Thirty-eight acres of additional bottom-land hardwoods and 0.9 acre of open water will be impacted by the construction of new Highway 465 bridge/culverts over the outlet channel. This work will provide 30.8 acres of permanent water in the pump station inlet channel.

k. Comment. Approximately 3 million acres of the 16 million acres of row cropland in the ARK-LA-MISS Delta are economically marginal (i.e., these acres of land cannot be farmed profitably). Rather than catering to the special interests whom would continue to represent that this 3 million acres of land should have been cleared and should be farmed, the Corps should adopt a leadership position in reforesting this land.

Response. The Vicksburg District does not agree that all of the agricultural land in the YBWP Area is marginal. Based upon the current analysis of the Yazoo Backwater Area Reformulation Study, the recommended plan provides a balanced alternative of flood reduction,

when considering that the majority of activities currently in progress will continue in the area; that the residents of the area can continue to reside in the area; and that up to 55,600 acres agricultural lands will be removed from agricultural production and reforested.

As a part of the revised Appendix 7, Mississippi State University updated the crop budgets and yields for the study area. The Mississippi State University report, attached to Appendix 7, concludes that the planting of crops in a timely manner will result in profitability.

15. Letter, Wildlife Management Institute, 11 December 2000. (Exhibit 4A-15).

a. Comment. WMI's entire opinion of this proposal can be summed up with the observation that the Corps' proposal brings a 1941 solution to a 21st-century challenge. The recommended plan merely continues the same obsolete incremental-flood-control-for-agricultural measures that have failed the Delta and its people for a century.

Response. The recommended plan balances the economic and environmental needs of the area by providing benefits to all resources in the area. The recommended plan will reduce the 100-year flood event by approximately 4 to 4.5 feet, and the 5- to 10-year event by approximately 5 feet. The acquisition of easements for reforestation/conservation features on up to 55,600 acres of agricultural land will produce significant environmental benefits for terrestrial, aquatic, and wetland resources and water quality.

b. Comment. The reformulation does not clearly state the Corps' objectives for the project.

Response. The Final Report contains a section on the objectives of the study.

c. Comment. The Yazoo Backwater Area reformulation demonstrates little more than vintage 1941 vision and technology.

Response. See response 15a.

d. Comment. The proposed reformulation sets the stage for even greater damages from future severe flood events.

Response. The information in the Final Report and FSEIS does not support the assertion that there will be greater damages from future severe flood events.

e. Comment. The Corps did not seriously consider any viable nonstructural alternative.

Response. See response 9g.

f. Comment, Page 4. The Corps used expensive, unnecessary actions to quickly eliminate as economically infeasible virtually all-nonstructural options, such as the Corps would charge $1,439 per acre for easements while the NRCS pays only $1000 per acre for easements.

Response. The Vicksburg District gave equal consideration to both structural and nonstructural alternatives. Four nonstructural alternatives were evaluated and carried into the final array; however, none of these alternatives was economically justified and thus, cannot be recommended for construction. Costs and benefits for all of the alternatives in the final array were evaluated at the same level of detail. Costs for easements were estimated by Vicksburg District Real Estate Division and are based on current pricing in the study area. The assertion that the cost of easements plus reforestation eliminated the nonstructural alternatives is false. The same cost was used to evaluate all alternatives and therefore, it could not skew the relative cost of the nonstructural alternatives.

g. Comment. The Corps' proposal apparently would eliminate or reduce wetland hydrology on as many as 269,525 acres of jurisdictional wetlands.

Response. See response 1a.

h. Comment. The project places YBA farmers at potential risk of losing farm program benefits.

Response. The project sponsor asked for clarification of third party exemptions from NRCS. The letter stated in part that "activities of a water resource district, drainage district, or similar entity will be attributed to all persons within the jurisdiction of the district or other entity. Accordingly, where a person's wetland is converted due to the actions of the district or entity, the person shall be considered to have caused or permitted the drainage.

Clearly, a third-party exemption does not apply to community-wide drainage projects. It is limited to actions of predecessors in interest and individuals, not drainage districts, the Corps, NRCS projects, or similar entities." Therefore, the project does not jeopardize a landowner's ability to receive government subsides.

i. Comment. This proposed reformulation is certain to promote agricultural intensification.

Response. There are no agricultural intensification benefits associated with the project.

j. Comment. This proposal constitutes a "green light" for renewed landowner efforts to clear remaining tracts of bottomland hardwoods above the 87-foot contour.

Response. The Vicksburg District believes there is a low probability of additional land clearing as a result of the project. Lands above the 87-foot contour would still be subject to Section 404 Regulatory Program and Swampbuster Provision. Section 404 of the Clean Water Act requires permits for the discharges of dredged or fill material into waters of the United States. The Food Security Act of 1985 (referred to as "Swampbuster") removed some incentives for wetland development by eliminating agricultural subsidies to parties that produce commodities on wetlands converted after enactment. The NRCS has indicated that clearing in the entire Mississippi Delta area over the last 20 years has totaled only 1,105 acres, and the provisions of Swampbuster are triggered by the removal of woody vegetation and not changes in drainage (reference Appendix 1, Attachment 2). There are 70,000 forested acres above the 5 percent duration elevation within the study area. Although these are nonwetlands, they have remained forested for the past 40 years. Appendix 1 includes a discussion of the risk and uncertainty of clearing forested lands above the 87-foot contour.

k. Comment. Much of the supposed economic gain from this project's agricultural intensification actually will come out of the pockets of U.S. taxpayers.

Response. In the 2000 DSEIS, there were agricultural intensification benefits; however, there are no agricultural intensification benefits in the FSEIS. By definition, intensification benefits are benefits to land where crop distribution changes under with-project conditions. The FSEIS does not project any change in cropping patterns under the with-project scenarios.

l. Comment. The Corps' reforestation proposal appears to be fundamentally flawed and infeasible.

Response. See response 9g.

m. Comment. The Corps' reformulation would impede rather than achieve ecosystem restoration in the YBA basin.

Response. See response 2b.

n. Comment. This proposal is fundamentally oriented at cross-purposes with current U. S. agricultural cropland retirement policy.

Response. See responses 3d and 9e.

o. Comment. The myriad occurrences of inconsistent numbers, as well as confusing or misleading claims, throughout the Reformulation undermine its overall credibility.

Response. The study team has worked diligently to correct inconsistencies and better explain Vicksburg District procedures in the Final Report and FSEIS.

p. Comment. There is a better way. A clear acknowledgement that the land below a certain level of flood frequency is unsuited for agriculture, urban development or industry, and should be dedicated to floodwater storage, ecosystem restoration and/or land uses that are not vulnerable to flooding. WMI suggest at least the two-year floodplain, up to possibly the five-year floodplain be so designated.

Response. The recommended plan reforests all agricultural lands primarily below the 1-year flood frequency. The study team did evaluate a nonstructural alternative to reforest the 2-year flood plain and determined it was not economically justified.

q. Comment. There is a better way. The precise areas of the designated flood-storage zone should be explicitly depicted geographically, for all to see and comprehend.

Response. There is no designated flood storage zone. Flood frequency zones were mapped in Appendix 6 (Engineering).

r. Comment. There is a better way. The government should help people who live, work or own land within the designated flood-storage zone to voluntarily evacuate or transition to flood-tolerant land uses. Anyone who knowingly refuses the government's offer of assistance would do so entirely at their own risk, and should be denied further government payments or subsidies.

Response. There is no designated flood storage zone. Based on the evaluation done by the Vicksburg District, a totally nonstructural approach would be much more expensive than the recommended plan.

s. Comment. There is a better way. The Corps' proposed up-front costs could be used to provide structural and nonstructural flood-proofing protection for isolated individual structures, in combination with structural protection for precisely targeted, geographically limited areas that have been the most built up.

Response. The Vicksburg District evaluated providing protection to the portions of the project area that contain concentrations of populations. Three of the four nonstructural alternatives in the Final Report evaluated flood proofing, raising the structures, or ring levees to provide protection to homes in the area. None of these alternatives were economically justified.

t. Comment. The Corps' proposed $15 million annual maintenance fee could instead be provided as an annual grant to help local communities make long-term adjustments to the fundamentally new economic challenges and opportunities.

Response. The annual operation and maintenance costs for the recommended plan are expected to be approximately $1.6 million per year, not $15 million. The Vicksburg District has no authority to make the payments that you propose.

u. Comment. The Corps' proposal is poor public, fiscal, agricultural and natural resource policy.

Response. See responses 2a, 2b, 2d, 3a, 3d, 3e, and 4a.

16. Letter, National Wildlife Federation (NWF), 8 December 2000. (Exhibit 4A-16)

a. Comment. There is a lack of congressional authorization for the recommended plan.

Response. See response 14e.

b. Comment. There is National Environmental Policy Act (NEPA) noncompliance due to the numerous omissions and discrepancies. The report is deficient in the amount, type, and quality of information provided, particularly environmental and hydrologic impacts. In many cases, notably in the hydrologic analyses, missing information prevents the reader from being able to evaluate the Corps statements regarding the effects of pump operation. The information presented also contains numerous discrepancies.

Response. The Vicksburg District has revised the FSEIS to address specific discrepancies identified by commenters. The FSEIS and appendixes provide information sufficient to describe the issues addressed. The Vicksburg District will provide additional data upon a written request.

c. Comment. The hydrological models used by the Corps in the Report are critical to the calculation of the project's economic benefits and environmental impacts. NWF has identified numerous potential fatal flaws and deficiencies in these models. For instance, flaws in the hydrological methods used by the Corps have resulted in a severe undercounting of wetland impacts. In addition, a fundamental error is the apparent confusion of the 87-foot elevation with the 1-year floodplain. The level at which the pump will be operated and at which water will be maintained is the basis for the calculation of economic and environmental impacts and benefits; therefore, it is critical that this target level is clearly defined, or a miscalculation of benefits and impacts results.

Response. This comment is noted. The Vicksburg District has separately responded to the Norman D. Johns evaluation attached to the comments, as well as to the November 2000 EPA "Technical Review" noted in the comment. The Vicksburg District does not agree that there were numerous flaws and deficiencies.

d. Comment. The Corps has stated that the pump trigger elevation for the recommended plan is 87 feet, but that some pumps may be turned on before stages reach elevation 87 feet, and that "refinements" to the pump trigger levels will be developed as part of the water control plan for the project. The pump operation and its effects on the areas hydrology are the basis for calculating the project benefits and environmental impacts; therefore, a definitive pumping schedule must be developed before these analyses can be accurately performed.

Response. The real-time pump station operation would use a forecast of Mississippi River stages, forecast of inflows from Steele Bayou and Big Sunflower River, and consideration of interior runoff conditions to determine requirements for pump station operation. Since the diesel-driven pumps cannot be simultaneously started, a pump station operation plan will be developed as part of the final plans and specifications. Specific refinements to the pump operation sequence will be developed as part of the water control plan for the project. The recommended plan pumping units and pump station layout are designed for a nominal pump-on/off elevation 87.0 feet, NGVD.

e. Comment. The absence of a Fish and Wildlife Coordination Act report is extremely troubling, and renders the report incomplete.

Response. The Final Report does include the final Fish and Wildlife Coordination Act report.

f. Comment. Failure to adequately evaluate environmental impacts is evidence by comments from the USFWS and EPA. The reformulation study does not adequately examine alternatives such as the Shabman/Zepp non-structural approach.

Response. The Final Report and SEIS adequately evaluate environmental impacts for all alternatives, including the Shabman/Zepp nonstructural approach. Also see response 9g.

g. Comment. The report does not adequately assess projects impacts to wetlands and other waters of the U. S. under Section 404 of the Clean Water Act.

Response. The Final Report and SEIS include a state-of-the-art GIS based wetlands impact analysis, and the functional analysis was performed with the HGM, which was jointly developed by ERDC and EPA. The revised Appendix 2 discusses Section 404(b)(1) issues, including potential impacts to the aquatic ecosystem from dredge and fill activities at the pump station site. Unavoidable impacts to environmental resources are addressed in the appropriate resource analysis.

The short- and long-term project impacts associated with the discharge of dredged and/or fill materials into waters of the United States were evaluated as required by Section 404(b)(1) of the Clean Water Act. The evaluation concluded that while there may be short term impacts from construction at the pump site, the reestablishment of bottom-land hardwoods up to 55,600 acres would offset many times any project-induced adverse impacts to wetlands. This evaluation is found at Appendix 2.

h. Comment, Para. 3, Page 5. The Corps has failed by a large margin to perform an adequate analysis of the cumulative environmental impacts of this project.

Response. See response 12h.

i. Comment, Para. 4, Page 5. By failing to consider a nonstructural solution to flooding problems in the lower Delta, the Corps has violated the NEPA.

Response. In accordance with NEPA, the final array of alternatives includes a wide range of structural and nonstructural solutions that were developed to address the problems and needs of the area. See response 9g.

j. Comment, Para. 5, Page 6. Perhaps one of the most distressing aspects of this project is the overwhelming evidence that the public participation process required by NEPA has not been taken seriously by the Corps. Statements made by Col. Crear at the 9 Nov. 2000 public meeting and responses via Internet evidence a disregard for public participation.

Response. In accordance with NEPA, the Final Report, along with Appendix 5, documents extensive public participation, including public comments and Vicksburg District responses. The Vicksburg District incorporated many of the suggestions into the Final Report and FSEIS. For example, three additional nonstructural alternatives were added to the final array of alternatives, and the wetland analysis was revised utilizing GIS and HGM functional analysis.

k. Comment, Para. C1, Page 7. The Corps should initiate formal consultation with the FWS to insure that the project will not likely jeopardize the continued existence of pondberry.

Response. The Vicksburg District has completed Section 7 formal consultation on the pondberry. The FWS determined that the project will not jeopardize the continued existence of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

l. Comment, Para C2, Page 7. The Corps has failed to comply with FWCA's procedural requirements or meet the FWCA standard of equal consideration for wildlife conservation in development of the Yazoo Backwater Pumps Project and preparation of the Report.

Response. By fully evaluating a range of structural, nonstructural, and combined alternatives, including approaches recommended by FWS, the Vicksburg District has met its duties under the FWCA.

m. Comment, Para. D, Page 8. The Corps' failure to identify specific lands for mitigation for even its much smaller claimed impacts in the project area, combined with the current backlog of unmet mitigation for other Corps projects in the Lower Mississippi River Basin, virtually ensure that the mitigation plan for the project will fail.

Response. Mitigation to offset adverse impacts is approximately 15,000 of the 55,600 acres of reforestation/conservation measures. The nonstructural feature of the recommended plan reforests agricultural lands primarily at or below the 1-year flood elevation. Appendix 1 provides a detailed listing of compensatory mitigation required by the Vicksburg District and substantiates that there are no unmet requirements. Mitigation for projects is accomplished concurrently with construction.

n. Comment, Para. II, A, Page 10. The recommended plan fails to meet the objectives of current federal policy by leaving residents subject to significant flooding risk, and by further failing to place a much greater emphasis on nonstructural hazard mitigation and environmental protection.

Response. See response 4a.

o. Comment, Para. II, B, Page 10. The recommended plan constitutes one of the most damaging water resource development proposals in the nation regarding direct adverse impacts to wetlands.

Response. As a combined structural and nonstructural alternative, over one-third of the expense will go toward easements for reforestation/conservation features. Under the recommended plan, wetland acres and functional values would be increased.

p. Comment, Para. II, C, Page 11. It is baffling that a federal agency plans to invest millions of taxpayers funds in a project designed to intensify production on agricultural lands.

Response. See responses 2a, 3d, and 4a.

q. Comment, Para. II, D, Page 11. WRDA of 1996 gave a special exemption for this project from cost sharing.

Response. In March 1986, the contract for the first item of work for the Yazoo Backwater Pump Station was awarded. Actual construction began on 5 May 1986. The first item included the inlet channel and outlet channel for the pump station and cofferdam construction around the site. Language drafted in the Water Resource Act of 1986 passed in October 1986 stated that any project started after April 30, 1986, would be subject to cost sharing. The Water Resources Development Act of 1996 added language that redefined the start of construction as when the contract is awarded thereby restoring 100 percent Federal responsibility for the completion of the YBWP.

r. Comment, Para. II, E, Page 11. In 1989 a governors advisory committee on the Yazoo Basin Project concluded that these projects were aimed to achieve purposes no longer completely relevant to the present needs of the people they were designed to benefit.

Response. In response to the request for review and redesign of the Yazoo Basin projects by Governor Ray Mabus of Mississippi, OMB directed a reformulation of these projects. Under this OMB directive four areas were identified for reformulation: Upper Steele Bayou, Upper Yazoo projects, Yazoo Backwater Project, and the Yazoo Tributaries Project. The Upper Steele Bayou Project and the Upper Yazoo Project have been reformulated and the projects were found to still be needed and are under construction today. The Yazoo Backwater Area Project is currently under reformulation. The Yazoo Tributaries project has been delayed until work on the Upper Yazoo River has sufficiently progressed.

s. Comment, Para II, F, Page 12. Contrary to a directive from OMB to provide greater emphasis to urban and environmental protection the proposed plan is weighted (84%) to agricultural interest.

Response. The Vicksburg District was directed to find solutions to flooding problems in the lower Mississippi Delta. This area is populated with about 1,300 structures impacted by the 100-year frequency flood. Any plan considered for implementation in this area must consider the agricultural activities that make up the bulk of the area economy. The plan proposed for implementation for this area will provide significant benefits to area residents. All of the 1,300 structures located in this area will receive some reduction from flooding. Eight hundred of the structures will be made free from flooding from the 100-year frequency flood, and the other structures will benefit from an improved level of flood protection. The nonstructural flood damage reduction feature of reforesting up to 55,600 acres of agricultural lands in the area will also provide significant environmental benefits to the area in addition to flood damage reduction. In all, the recommended plan is consistent with the OMB directive.

t. Comment, Para III, A1, Page 12. The Yazoo Backwater Area is complex hydrologically, for both natural and man-made reasons, and the modeling procedures used to simulate this watershed must be tailored to reasonably reflect this complexity. First, there are multiple sub watersheds, which drain into the area: those of the Little and Big Sunflower Rivers, Deer Creek, and Steele Bayou. The problematic interior ponding behind the Mississippi and Yazoo levees which the pumps are proposed to address can be caused by water originating in one or more of these source streams. This has been amplified by the inter-connecting channels that the Corps has previously completed between all these streams in the lower portions of their respective drainages near the levees. Also, the mild slopes of the landscape in the study area lead to broad overland flow with a gently sloped floodwater surface.

Response. The Vicksburg District agrees with your assessment that the Yazoo Backwater Area is hydrologically complex. The Period of Record (POR) routing model used in the hydrologically complex analysis of the Yazoo Backwater Area was tailored to reflect the Base Conditions and Alternative Conditions presented in the Final Report and FSEIS.

u. Comment. The benefits that the Corps claims the Yazoo Backwater Pump would provide to the Lower Mississippi Delta area are highly doubtful because of serious problems in the hydrologic analyses the Corps has performed for this project. The hydrologic analyses are beset with a host of conceptual errors, undocumented procedures, and internal inconsistencies. The importance of these problems cannot be overstated since the results of these analyses are used to forecast water levels and flooded acreage in the study area with and without the proposed pumps. Therefore, all project benefits derive from these hydrologic analyses. Included as part of NWF comments on the report is an itemized listing and discussion of the many conceptual and procedural errors in the Corps hydrologic modeling and analyses.

Response. The Engineering and Environmental Appendixes adequately address the environmental and hydrologic impacts to the Yazoo Backwater Study Area. The report provides all of the hydraulic and hydrologic data required by USACE regulations and is sufficient to assess the project effects.

v. Comment, Para III, A2, Page 13. Simply put, the justification for the project presented in the report is not credible based on the economic analysis provided by the Shabman Study.

Response. See response 9j. With respect to this particular comment, the Vicksburg District data support the conclusion that delayed planting has significant economic impacts. The Vicksburg District does not agree with the findings of the Shabman study. The findings by all land grant universities in the three state areas of Arkansas, Mississippi, and Louisiana indicate that delaying planting of the primary crops grown in the backwater area can decrease yields significantly, which decreases net returns. Many recent reports indicate that early planting of these primary crops can result in significantly improved yields and quality and reduced costs. This is a key point of disagreement in the two analyses.

w. Comment, Para. III, A3, Page 13. Despite the public investment, the project will not protect structures from flooding in the Standard Project Flood (SPF).

Response. The Backwater Area project, as developed, does provide for this area to be inundated to save the mainline Mississippi River levee from failure should a SPF occur. The statement that this project will not protect structures from flooding in SPF is a true statement. The SPF level of protection is not a standard for USACE projects. The cost of providing complete structure protection from the SPF would be prohibitive to protect against such a rare event. The SPF is such a rare event that specific frequency estimates are not feasible as stated in EM 1110-2-1411. The recommended plan will provide up to the 100-year frequency level of flood protection from backwater flood events to many homes and businesses in the Yazoo Backwater Study Area, which will significantly increase the quality of life for the area residents.

x. Comment, Para. III, A4, B Page 14. The recommended plan will cause significant environmental impacts based on EPA's review of the reformulation report.

Response. Since release of the Draft Report, The Vicksburg District has worked extensively with EPA to address their concerns. Our analysis in the Final Report and FSEIS indicates there will be net environmental benefits with the recommended plan.

y. Comment, Para. B1, Page 15. The Corps has vastly under calculated the compensatory mitigation required for this project.

Response. Mitigation to offset adverse impacts is approximately 15,029 acres and is incorporated into the nonstructural feature (Appendix 1). The Vicksburg District has committed to obtaining this acreage before pump station operation.

z. Comment, Para. B2, Page 15. The Corps advocates that sufficient laws and policies are available to prevent any substantial conversion of bottom-land hardwoods but states that changes in hydrology contribute to BLH clearing.

Response. During the years that land clearing was occurring in the Mississippi Delta, there were essentially no laws or regulations that restricted this activity. During this time, changes in agricultural prices had the largest impacts on land clearing activities. The latest large-scale clearing in the lower delta occurred as a result of a surge in the price of soybeans. During this time, soybean prices reached as high as $12 per bushel. The land clearing took place in the lower Delta even though the levee system for this area was not completed. The price of clearing lands has increased significantly since this time, while the price received by farmers for soybeans has decreased. Also during the time when this clearing was taking place, prices for timber, particularly hardwood, were very low and hunting did not generate any income. These conditions changed with the Swampbuster Act, which regulates clearing of existing forested wetlands for agricultural purposes. Currently, there are 70,000 forested acres above the 5 percent duration elevation within the study area. Although these are non-wetlands, they have remained forested for the past 40 years. Appendix 1 includes a discussion of the risk and uncertainty of clearing forested lands above the 87-foot contour.

aa. Comment, Para. B3, Page 16. The Corps has failed to adequately address a number of water quality concerns.

Response. Appendix 16 addresses potential impacts to water quality from each of the proposed alternatives. Emphasis is given to potential impacts on the impaired waters of the state within the project area. Where possible, the document uses scientific studies to support the analysis and conclusions.

bb. Comment, Para. B4, Page 16. The Corps has failed to adequately address how changes in hydrology in the basin affect the pondberry plant.

Response. The Final Report addresses the impact of project-induced changes to hydrology on the endangered plant pondberry. The Vicksburg District has completed Section 7 formal consultation on the pondberry. The FWS determined that the project will not jeopardize the continued existence of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

cc. Comment, Para. B4, Page 16. There is not sufficient lands below elevation 87 feet to meet the easements outlined in the report. The Corps is behind 25,000 acres in past mitigation.

Response. See responses 11f and 11g.

dd. Comment. The Corps should abandon its efforts to justify this outdated and ill-advised project, which would benefit only a few large landowners at great expense to the federal taxpayers and the environmental resources of the Delta.

Response. See response 4a.

17. Response to Norman Johns letter of 8 December 2000.

General Introduction from Norman Johns Report:

Dr. Johns contends that the Corps hydrologic analysis is beset with a host of conceptual errors, undocumented procedures, and internal consistencies. He takes exception to the identification of various alternative plans analyzed through the project scoping and plan formulation process. This is not a weakness in the hydrologic analysis process as he has alleged, but is instead a factual history of the alternatives that were considered in the Plan Formulation Process.

Responses to Comments from Norman Johns Report:

a. Comment 1. The implication of utilizing synthetic stream flows rather than actual measured values is that the resulting determination of flooded areas from the routing model and therefore project benefits are not adequately substantiated.

Response. The HEC-IFH model was utilized in this study to develop POR inflows and was used to supplement the partial record of stage data available. The hydrologic model was calibrated with observed data.

b. Comment 2. The Corps has not adequately followed their own recommended procedures for model verification.

Response. The HEC-IFH model used in developing the synthetic stream flow record for input to the period of record routing model was based on the best data available. The model was calibrated and verified according to USACE regulations.

c. Comment 3. The resulting determination of flooded areas is not accurate enough to substantiate the project benefits.

Response 3. Project benefits were determined from the difference between base and with-project conditions. To provide consistency, the data from the same model was used to generate the base and with-project daily stages.

d. Comment 4. The implication of utilizing unverified hydrographs is that the resulting determination of flooded areas is not accurate enough to substantiate the project benefits.

Response 4. In accordance with USACE regulations, the output of the routing model was verified with observed data.

e. Comment 5. Unit hydrographs that reflect current conditions in the watershed need to be revised based on changes in the basin.

Response 5. The unit hydrographs reflect current conditions in the watershed.

f. Comment 6. The implication of utilizing generalized "runoff factors" values is that the resulting determination of synthetic streamflows and flooded areas is not accurate, and project benefits are not substantiated.

Response 6. Runoff factors vary from approximately 5 percent of the rainfall in the summer and fall to approximately 75 percent during the winter and spring depending on antecedent conditions, rainfall distribution, and rainfall intensity. Observed data show that annual runoffs vary from approximately 6 to 41 inches and average approximately 25 inches over the drainage area. Approximately 80 percent of the runoff occurs during the 6-month period December–May. The runoff coefficients are average monthly values that reflect conditions in the basin.

g. Comment 7. The adequacy of the runoff coefficients utilized for the HEC-IFH model should be verified.

Response 7. Runoff coefficients were average monthly values. The POR model used in this analysis adequately verified observed flood stages which indicate that monthly runoff coefficients used were appropriate.

h. Comment 8. The expected elevation and recurrence interval for the Mississippi PDF should be provided.

Response 8. The proposed Yazoo Backwater Reformulation Project will have no impact on conditions which might occur on the Mississippi River or its Backwater areas in a Project Design Flood (PDF); therefore, these impacts were not addressed in this report. The operation of the MR&T during the PDF has been discussed in previous reports.

i. Comment 9. The use of an inappropriate routing model is that the resulting determination of flooded areas is not accurate enough to substantiate the project benefits.

Response 9. The appropriateness of any model for a particular application is determined by whether or not it can be calibrated to observed data. Appendix 6 explains the model calibration and verification.

j. Comment 10. The routing model used by the Corps would appear to be fundamentally inappropriate.

Response 10. As previously stated in response 9, the routing model utilized was appropriate for the analysis and resolution of flooding problems which the Backwater area experiences. Elevation area and volume curves were developed utilizing satellite imagery of observed flood events. The flood scenes inherently incorporate the water surface slope from the observed flood events. Therefore, they accurately reflect the nature of flooding in the basin.

k. Comment 11. The flooded area curves are inappropriate.

Response 11. The data points used to develop the stage area curve are in the Final Report. Project benefits are determined from the difference between the base and with project flooding. The same stage-area curve was used to determine the flooding for all conditions. This minimizes any bias in the stage-area curves because it is equally applied to all conditions.

l. Comment 12. The approach used to develop the elevation-area curves appears to be only approximate.

Response 12. The stage-area curves were developed by subdividing the study area into hydrologic reaches. A stage-area curve was developed for each reach. The stage-area relationships were then converted into frequency-area curves. A cumulative stage-area curve was developed from the individual curves. The use of subbasins in the analysis reduces the approximate nature of the curves. We agree that the curves present an approximate estimate of the area flooded and that there can be some variability due to the coincidence of headwater floods with the backwater stages. However, the curves present information well within acceptable levels for use in the alternative formulation and environmental impact analysis. The same curves are used in both the existing without-project analysis of flooding and for the condition with the project in place, which ensures that both conditions are treated equally.

m. Comments 13-15, Page 7. Area-Elevation Curves, lack of uniqueness 2, 3, & 4.

Response 13–15. These comments continue to expound on perceived problems in the Vicksburg District development of the area-elevation data. The fact remains that the delineation of flooded areas using all the satellite imagery available at the time of development was the most reliable, state-of-the-art means to develop a stage-area relationship in a large complex area. The dates for all of the satellite scenes utilized in development of the stage-area curves are provided in the Final Report. The use of daily stages to calculate flooding captures the change in flood extent as the flood waters move from the upper sump to the lower sump.

n. Comments 16-17, Pages 8-9. Storage-elevation, not consistent with storage-area curves and routing method.

Response. The stage volume curves were developed from numerical integration of the stage-area curves. The stage area and volume curves were verified using the Flood Event Simulation Model (FESM). The FESM model is a GIS based flood extent model developed by the Vicksburg District. The FESM model provides both area and volume of flood events. The area and volume of the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year flood events were compared and found to be within an acceptable range of engineering accuracy. This comparison is discussed in the Engineering Appendix.

o. Comment 18, Pages 9-10. Levee seepage flow.

Response. The Yazoo Backwater Area is bounded by the Mainline Mississippi River Levees on the west, the Yazoo Backwater Levees on the south, and the Yazoo River and Will M. Whittington Levees on the east. These levees total approximately 260 miles in length. They generally are not completely impervious, and seepage may pass through or beneath the levees. In fact, a large number of relief wells have been built along the Mississippi River levees to control seepage and sand boils, which occur when river stages exceed the stages on the landside

in major floods. The Yazoo Backwater POR Routing model used in this study uses the same criteria and seepage curve data as interior routing models such as the HEC-IFH model, which also assumes that seepage can occur as inflow from the exterior to the interior only. Seepage can occur along an extensive reach of the Mississippi River even when stages at Steele Bayou outlet may be higher than the river. Often, the landside of the levee is not inundated in some upper reaches. Therefore, seepage curves were developed based strictly on the Mississippi River level and assumes average flood conditions in the Yazoo Backwater Area and Tributary streams. The 313 days to which Dr. Johns refers probably did have extensive seepage along over 200 plus miles of Mississippi River levee even though stages on the landside were higher than on the river at the Steele Bayou outlet. The methodology used in this analysis is the accepted hydraulic method for analyzing seepage inflows. The verification of the model indicated a reasonably accurate calibration of the rainfall runoff and including seepage; therefore, the forecast reductions are accurate.

p. Comment 19, Page10, Model Calibration.

Response. As discussed in responses to comments 3, 4, 16, and 17, the Vicksburg District developed a complex state-of-the-art model to analyze hydrologic aspects of the Yazoo Backwater Area. The model was calibrated and verified by comparing computed versus observed data for several years. This calibration and verification of the model is discussed in the revised Engineering Appendix.

q. Comment 20, Page 11, Model Verification.

Response. Model verification – see response to 19 above.

r. Comment 21, Page 11, Model Sensitivity.

Response. During the model calibration and verification analysis, a variety of input data such as runoff coefficients, developed rainfall hyetographs, seepage data, and tailwater conditions were used to check the sensitivity of the model.

s. Comment 22, Page 11, Model Results, Stage-Frequency Curves.

Response. The Engineering Appendix provides a discussion of the process by which stage-frequency data were determined. Appropriate procedures were utilized which met with approval of the USACE Independent Technical Reviewers.

t. Comment 23, Page 12, Inconsistency in Area-Elevation Curves.

Response. There is a discrepancy between the two tables. These tables have been corrected in the Final Report. With regard to the excluded pond area, the maximum difference will be noted at the 20-year frequency flood. The elevation of the outside levees of the ponds was determined and some ponds start to be inundated at the 25-year event. Almost all of the ponds are inundated or isolated by the 100-year event, so the excluded acres drop after the 20-year event.

u. Comment 24, Page 12, Determination of Average Annual Acres Flooded.

Response. Appropriate data curves were prepared for each reach of the study area to establish flood damages. These curves depict the relationships between stage, and area inundated, stage and frequency of occurrence, area inundated and frequency of occurrence, stage and damages, and damage and frequency of occurrences.

Our reference that explains the average annual value determination (annualization process) is the Expected Annual Flood Damage Computation Users Manual, dated March 1989, from the Hydrologic Engineering Center, U.S. Army Corps of Engineers. The P&G stipulates that benefits and costs are to be developed such that a direct comparison can be made. In order to make this comparison, benefits and costs must be annualized. Developing and stylizing the average annual acre process allow for this direct comparison of annual benefits to annual costs.

A stage-area curve reflects the acres of land inundated by floods of various stages referenced to the index gage. Using historic data, a stage-frequency curve is developed that reflects the expected percent chance of occurrence in one year of any particular stage at the index station. The area-frequency curve, when integrated, determines the average area that could be expected to be inundated on an average annual basis. The area-frequency curve is a combination of the stage-area and the stage-frequency curve; i.e., the area expected to be inundated by flood reaching a given stage plotted against the frequency for that stage expressed as average number of occurrences per year. Analyzing the total array of points included in the area under the area-frequency curve produces average annual acres. Acres flooded by all potential flood events, weighted by each flood level's probability of occurrence, contribute to the average annual flood acres. In many years, the same acres flood more than once and these flooded acres are tabulated for each flood event.

v. Comment 25, Page 12, Average Annual Acres Flooded are Highly "Synthetic."

Response. HEC hydrologic and hydraulic numerical models are internationally recognized and have been utilized by the Vicksburg District for many years. Extensive calibration has been conducted on these models to assure that output from these models is reliable.

w. Comment 26, Page 13, Inconsistent Evaluation of Local Flood Protection.

Response. In the final array, each of the alternatives were evaluated utilizing the same methodology in determining flood damages and flood reduction benefits. The final array of alternatives included a no-action, four nonstructural, one structural, and four combination alternatives. Based on this analysis, the recommended plan, Alternative 5, includes both structural and nonstructural features to reduce flooding in the study area. An indepth description of the analytical process utilized to reach this conclusion is included in the Final Report.

x. Comment 27, Page 13, Flood Damages in Reach 1, Role of Corps Hydrologic Interconnections.

Response. The connecting channel is considered part of the overall YBWP that was analyzed in this reformulation study as base conditions. Flowage easements on 19,490 acres were purchased up to elevation 85 feet, NGVD, in Reach 1 to compensate landowners for induced flooding. These analyses were performed during the planning stages of the connecting channel. This report analyzes the hydrologic impacts of the pump station. The Yazoo Backwater Reformulation Study documents that the Big Sunflower levee alternative was not economically justified and caused more environmental damage compared to the pump alternative.

y. Comment 28, Page 13, Flood Damages Determination in Appendix 7, Inconsistent with Hydrologic Modeling.

Response. The economic analyses were based on the hydrologic analyses as described in Appendix 6. In the Final Report, additional descriptions are provided in Appendix 7 to further identify these analyses.

z. Comment 29, Page 13, Flood Damages Determination in Appendix 7, Undocumented Values.

Response. The Final Report was revised to include more detailed information on how flood damages and benefits were derived. The multipliers in Table 7-8 are documented in the Final Report.

aa. Comment 30, Page 14, Appendix 7, Inconsistent Determination of Flood Depths.

Response. The structure damage data derived by the URBAN and the HEC/FDA programs are based on stage-frequency data developed in the hydraulics and hydrology analysis as described in Appendix 6. The first-floor elevations for each structure were tied to a stage-frequency curve for with- and without-project conditions. These stage-frequency curves were developed for each economic reach and used appropriately in determining the damages for each structure located within the Yazoo Backwater Study Area. The hydraulics and hydrology analysis as described in Appendix 6 also derived a series of stage-frequency data for the 1-year through the 100-year frequency flood event for both with- and without-project conditions for each economic reach. These stage-frequency data were utilized in conjunction with the computed stage-frequency data from the POR model to accurately tie the with- and without-project stage-frequency data to the structures located in the Yazoo Backwater study area.

bb. Comment 31, Page 14, Appendix 7, Flood Depths as Inputs to URBAN.

Response. The hydraulics and hydrology analysis as described in Appendix 6 also derived a series of water surface profiles for a range of flooding events from the 1- to 100-year events. These water surface profiles were derived for both existing and a wide array of potential with-project conditions. These water surface profiles were derived for each hydrologic reach. Refer to the previous response.

cc. Comment 32, Page 14, Appendix 7, Flood Areas as Inputs to Agricultural Crop Damage Program (CACFDAS).

Response. The daily stage (elevation) data were not directly derived from HEC-IFH. The data were derived from the POR routing model for the period 1943 to 1997. The HEC-IFH model was used only to develop the hydrologic inflow data used in the POR routing model.

dd. Comment 33, Page 14, Appendixes 7 and 7A, Risk and Uncertainty in Structure Flood Damage Calculations.

Response. The procedures and key variables utilized in the risk analysis are described in more detail in the Final Report.

ee. Comment 34, Page 15, Appendixes 7 and 7B, Risk and Uncertainty in Agricultural Flood Damage.

Response. Additional description and discussion of the risk analysis of agricultural crops are provided in the Final Report.

18. Letter, Earthjustice Legal Defense Fund, 8 December 2000. (Exhibit 4A-17)

a. Comment, Page 4, No. 1. The Yazoo Pumps will cause environmental devastation on a scale that is inconceivable and unacceptable.

Response. The comment summarizes statements and positions of others which are noted and to which the Vicksburg District has separately responded.

b. Comment, Page 5, Para. 1a. The Yazoo Pumps will cause Ecosystem-Wide Destruction. EPA has determined that the Yazoo Pumps will alter the hydrology of the entire project area, and will drain and damage over 200,000 acres of wetlands.

Response. The estimate that the Yazoo Backwater project would alter 200,000 acres of wetlands was based on an estimate of wetland extent using the 1989 Wetland Delineation Manual (89-WDM). In 1991, Congress instructed EPA and the Vicksburg District to use the 1987 Wetland Delineation Manual (87-WDM). The Final Report and FSEIS contain a revised Appendix 10 (Wetlands), which includes two new estimates of wetland extent based on the 87-WDM. The EPA and Vicksburg District independently estimated that the study area contained approximately 200,000 acres of wetlands (EPA, 216,000; Vicksburg District, 189,600). These two estimates are based on the assumption that backwater flooding is the sole source of water to sustain wetlands, and that the 51 inches of annual precipitation would not sustain these wetlands. The EPA's estimate includes wetlands sustained by precipitation, headwater flooding and backwater flooding, while the Vicksburg District's estimate is restricted to those wetlands sustained by backwater flooding. The Vicksburg District estimated that 26,300 acres of wetlands may no longer meet the Federal definition of wetlands. An additional 40,900 acres would experience shorter duration of flooding, but would retain their wetland status. The baseline wetland functional capacity is 885,300 FCUs, and the net functional loss is 14,200 FCUs. This loss represents 1.6 percent of the baseline functional capacity.

The Vicksburg District has completed Section 7 formal consultation on the pondberry. The FWS determined that the project will not jeopardize the continued existence of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

All environmental impacts were assessed for both public and private property. Although the project will affect environmental value on these properties, the net effect of the project will be an increase of environmental value in the study area.

The Yazoo Backwater project will not increase sediment, pesticide, or nutrient loading within the study area. The same water will be discharged into the Yazoo and Mississippi Rivers, only the timing of the discharge will change. The Vicksburg District carefully evaluated the settling capacity of backwater areas and found that the flood duration reduction benefits of the project would not interfere with the duration needed to assure adequate settling of sediments from the water column. The nonstructural reforestation/conservation feature will reduce erosion, the nonpoint source runoff of sediment and the agricultural chemicals attached to those sediments (i.e., pesticide and nutrients). In addition, reforestation of agricultural lands will improve the wetland functions associated with sediment, pesticide, and nutrient removal on those lands. Overall, the project should reduce the amount of agricultural chemicals and sediment entering the Yazoo and Mississippi Rivers.

c. Comment, Page 7, Para. 1b. The Yazoo Pumps will not improve the environment, and the Corps' claims to the contrary are an overt breach of trust.

Response. Separate analyses of habitat functions for waterfowl, wetland, terrestrial, and aquatic resources have documented both the positive and the negative impacts to the environment from the recommended plan. These studies showed that terrestrial resources would increase 11.2 percent, wetland resources would increase 19.5 percent, aquatic spawning resource would increase 30.3 percent, aquatic rearing resource would increase 8.0 percent, and waterfowl resources would increase 52.8 percent. Mitigation (15,029 acres) for the adverse effects associated with the construction and operation of the pump station is included in the nonstructural reforestation/conservation feature (up to 55,600 acres). Although normal silvicultural practices will be allowed on the reforestation/conservation lands, timber harvest for economic return normally does not occur during the first 50 years (the project life) of a bottom-land hardwood stand.

Based on 2005 land use data, there are 42,800 cleared acres available in the 1-year frequency flood plain. There are 56,428 acres in the with-project 2-year frequency flood plain. Prior to pump station operation, the Vicksburg District will acquire 15,029 acres of easement lands in order to achieve no net loss of environmental resources. Acquisition of the remaining easements will continue for 10 years after construction of pump station is complete.

Mitigation monitoring is included in the Final Report and FSEIS. The District will monitor the land use of these tracts. Should this monitoring indicate a violation in the terms of the easement, the Vicksburg District will take the necessary action to regain voluntary compliance with the terms of the agreement or use legal actions, if necessary.

As a project feature, the Vicksburg District will acquire easements from willing sellers on up to 55,600 acres. These lands will either be reforested or other conservation measures will be implemented. Once an easement is secured, a reforestation plan will be developed that will evaluate the species of trees most suitable for this tract. The evaluation will include a review of the flooding regime for the area, soil types, tree species common to the area, planting dates, and other factors which may affect the seedling survival.

Since 2000, ERDC has been monitoring wetland functional values in the Yazoo Basin for the Vicksburg District. Annual monitoring reports are included as attachments to Appendix 1. Long-term land use monitoring will be conducted utilizing remote-sensing techniques. On-the-ground inspections will be conducted to verify the remote-sensing results.

d. Comment, Page 9, No. 2. The Yazoo Pumps are an unwarranted agricultural drainage project designed to benefit large landowners and will not provide real flood protection to people in need.

Response. There are over 1,300 homes in the area that are impacted by the 100-year frequency event. With implementation of the proposed Yazoo Backwater Area Project, approximately 800 of these homes would be free from flooding by the 100-year event. The project would also reduce the damages and duration of flooding for the remaining structures. The majority of these homes are located in Sharkey and Issaquena Counties where approximately 31 percent of the population lives below the poverty level. In addition to local benefits, the project would also provide additional national benefits. Everyone who uses stores, schools, roads, medical facilities, or owns businesses and farms would benefit. Project benefits will return $1.4 in economic benefits to the country for every $1 invested. The project, as proposed, would replant up to 87 square miles (up to 55,600 acres) of the alluvial flood plain, an area which accounts for approximately 20 percent of farmland that is now in use. This will provide a net increase in environmental resources in the project area.

While it is true that the majority of the benefits are agricultural, they accrue over the range of flood frequencies (i.e., 1 to 100 year). The agricultural flood damage/benefit evaluation was conducted using 2005 Current Normalized Prices, which are dictated for use in Water Resource Evaluations by ER 1100-2-100. This guidance does not allow for deviation from the normalized prices and can differ greatly from actual market prices. Current demand for corn for use in ethanol production in 2007 has caused market prices to double those specified in the 2005 normalized prices. Using current market prices would cause net returns to increase from those shown in the Final Report and FSEIS. Agricultural benefits accrue to those lands in agricultural

production in the study area. These are benefits to the nation because they reduce the loss for all taxpayers, not just those directly impacted within the study area. Agricultural subsidies are acknowledged to play a role in the decisions that are made by farmers.

e. Comment, Page 10, No. 2. The Corps does not have the necessary hydrologic data and has not done the necessary level of analysis to make any assurances that the pumps will prevent homes from flooding.

Response. The hydrology and hydraulic analysis was conducted in accordance with USACE guidance and regulations (EM 1110-2-1413). The analysis was independently technically reviewed by other USACE Districts.

The Vicksburg District has spent approximately $1.4 billion historic dollars on flood control projects in the Yazoo Basin. These projects provide flood damage protection to more than 6,800 square miles (4.4 million acres) and approximately 323,000 residents.

The quote from the 1965 report to Congress was taken out of context. The report goes on to recommend that the pump station not be eliminated from the project. The report's observation was based on an analysis of hydrologic conditions at that time. Since 1965, the Mississippi River bed at Vicksburg has aggraded, and most of the flood damage reduction benefits gained from the Mississippi River bendway cutoffs have been lost. These changes in hydrology are documented in the 1976 FEIS, Mississippi River and Tributaries, Mississippi River Levees and Channel Improvements. Further data documenting the changes in Mississippi River stages at Vicksburg are included in the revised Appendix 6 (Engineering).

The statement that the 1941 FCA does not authorize pumping below elevation 90.0 feet, NGVD, is incorrect. The 1941 FCA instructs the Vicksburg District to lower the 5-year frequency flood elevation to less than 90.0 feet, NGVD. The recommended plan achieves this goal.

f. Comment, Page 11, No. 2. It is clear that the Corps is recommending that lands below 90 feet be drained of water only to allow increases agricultural use of those lands.

Response. Increasing agricultural production by additional land clearing is not a purpose of the recommended plan. Rather, reforestation will convert land currently in agricultural production into forest. Those lands above 87.0 feet, NGVD, will be able to produce crops in a more efficient and effective manner. These lands will not experience the same level of damaging floods that exist currently. This will reduce the costs of production. Research has shown that the

primary crops grown in the lower delta can produce higher yields when they are able to take advantage of earlier planting dates. This will allow area farmers to lower cost per unit of production. No significant changes in cropping patterns are projected to occur in the study area as a result in the change in flooding.

While very few structures are located below elevation 91.0 feet, NGVD, numerous roads, emergency services, and utilities are impacted by the frequent flooding experienced in the study area. Flood damages and benefits for structures are based on elevation, value, and flood frequency. Flood damages and benefits are computed without regard to the number of structures that have flood insurance. The Vicksburg District investigated the number of structures that have flood insurance and found that 223 residential structures in Sharkey and Issaquena Counties had flood insurance policies. Of these 223 policies, 111 policy holders incurred flood damages multiple times during the period 1978 to 2004. These same 111 policy holders incurred 817 flood losses, with property damages of $4.6 million during this period.

The recommended plan addresses the OMB directive (1991) by providing greater levels of flood protection for urban areas, reducing levels of agricultural intensification, and reducing adverse impacts to the environment.

g. Comment, Page 12, Para. 3a. The Yazoo Pumps violate the clean water act.

Response. The Vicksburg District evaluated the regulations, Executive Orders, and authorities identified in this comment and does not agree that the recommended plan violates any Clean Water Act standards.

h. Comment, Page 14, Para. 3b. The Yazoo Pumps violate the nation's wetlands protection laws and policies.

Response. The Vicksburg District evaluated the regulations, Executive Orders, and authorities identified in this comment and does not agree that the recommended plan violates any of the Nation's wetland protection laws and policies.

i. Comment, Page 16, Para. 3c. The Yazoo Pumps violate the nation's agricultural policies.

Response. The Vicksburg District does not agree that this project violates national agricultural polices. If implemented, the project will reforest up to 55,600 acres of agricultural lands, removing these acres from production and helping to reduce the surplus of acres currently in crop production. Project implementation would reduce the amount of agricultural cropland in the Yazoo Backwater study area. The proposed project would not change the extent of the 1-year flood plain. The agricultural benefits associated with this project would be limited to

adjusting to modern farming practices (planting earlier in the growing season) for those lands located above the existing 2-year frequency flood plain, thereby increasing yields on the remaining cropland.

The NRCS has indicated that clearing of bottom-land hardwoods in the entire Mississippi Delta in the last 20 years has totaled 1,105 acres. They also stated that provisions of "Swampbuster" are triggered by the removal of woody vegetation and not changes in drainage. Currently, there are 70,000 forested acres above the 5 percent duration elevation within the study area. Although these are nonwetlands, they have remained forested for the past 40 years. Appendix 1 includes a discussion of the risk and uncertainty of clearing forested lands above the 87.0-foot contour.

j. Comment, Page 17, Para. 3d. The Yazoo Pumps violate the nation's floodplain policies.

Response. Plan formulation for the proposed project fully meets the intent of EO 11988 on Floodplain Management. The Vicksburg District has considered a range of alternatives to avoid adverse impacts in the flood plain. The extent of the 1-year flood plain will not be affected. By raising the pump-on elevation from 80 to 87 feet, NGVD, the recommended plan avoids adverse effects to terrestrial, wetland, waterfowl, and aquatic resources on approximately 216,000 acres.

k. Comment, Page 18, Para. 4. As a matter of law, the Corps may not construct or operate the Yazoo Pumps because they are not authorized by congress.

Response. The project is authorized by the FCA 1941. In order to meet this directive utilizing a 14,000-cfs pump station, pumping must be initiated at an elevation less than 90 feet, NGVD. To initiate pumping at elevation 90 feet, NGVD, a larger pump station capacity would be required. The recommended plan reduces the 5-year frequency flood elevation to less than 90.0 feet, NGVD, at the Steele Bayou structure. The recommended plan achieves this goal as authorized.

l. Comment, Page 20, No. 5. The Yazoo Pumps are not economically justified.

Response. Based upon The Economic and Environmental Principles for Water and Related Land resources Implementation Studies and The Economic and Environmental Guidelines for Water and Related Land Resources Implementation Studies, ER 1105-2-100, dated 22 April 2000, regulations that authorize the USACE to complete Civil Works water resources projects, including flood damage reduction and ecosystem restoration, the recommended plan is justified economically with a benefit-cost ratio of 1.4:1.

Dr. Shabman utilized a land property-based analysis as the basis of his economic analysis; this method does not comply with the regulations noted above. Congress dictated the crop prices which are used in the economic evaluation of water resource projects (i.e., current normalized). These "current normalized prices" are computed by USDA. Flood damages are based on the current land use and not on the value of the land protected/impacted. The FSEIS was updated to 2005 land use including USDA's WRP and CRP enrollment. The acreage cap for WRP enrollment in Sharkey and Issaquena Counties has been reached, and no further lands are expected to be enrolled in these counties.

The Vicksburg District carefully considered all of EPA's comments and carried forward a variation of the Shabman Plan, despite the fact that it was not economically justified. The EPA's Shabman Plan does address relocation of residents and businesses subject to frequent flood damage; this feature does not fully address the flood damage reduction needs of the study. In addition, it only addresses agricultural flood damage reduction by the reforestation of 88,000 acres within the 2-year flood plain. The Vicksburg District's recommended plan addresses impacts to residences, structures, and agricultural land within the 100-year flood plain. The EPA's plan does not meet the study's objectives.

Flood damage reduction benefits were computed on the lands reforested for all of the alternatives evaluated. These benefits are presented under the nonstructural category of flood reduction benefits found in the 2007 Final Report and Appendix 7. Removing lands from crop production by reforestation reduces flood damages and thus, is a legitimate flood damage category. In absence of the project, these lands would continue to incur flood damages and thus, these flood damage reductions benefits to these lands are realized with project implementation.

First costs in the 1982 report were $149.9 million with a BCR of 1.3:1.

m. Comment, Page 24, No. 6a. The Corps has based its entire analysis on a fundamentally flawed and scientifically inappropriate hydrologic analysis.

Response. The hydrologic and hydraulic (H&H) analyses used in the study are not fundamentally flawed. The H&H analyses were conducted in accordance with USACE guidance and regulations (EM 1110-2-1413).

The interior routing model utilized in the study is a complex model which was developed specifically for the complex hydrologic conditions in the study area. Channel cross sections were utilized in a HEC-RAS model to determine the with-project conditions at the gages located within the study area. This model was provided to the EPA's hydrology expert for his review.

The development of the elevation-area and stage-frequency curves utilized in this study were presented to EPA in meetings subsequent to the 2000 Draft Report. The EPA agreed that this methodology was appropriate to use on a planning study. Data points supporting the curves were also provided to EPA for their review.

The H&H analyses were independently technically reviewed by other USACE Districts.

n. Comment, Page 26, No. 6b. The Corps wetlands impacts analysis is fundamentally flawed.

Response. The wetland analysis has been revised and can be found in Appendix 10 (Wetlands), the Final Report, and FSEIS. The revised wetland analysis was first presented to the EPA in February 2003. Between 2003 and 2006, the Vicksburg District and EPA met several times to discuss the Vicksburg District's offsite delineation and functional analyses. The revised analysis is based on a state-of-the-art GIS method. Included in Appendix 10 is a revised estimate of wetland extent. The wetland extent was verified by an extensive field study designed by the EPA, utilizing their EMAP program. The field verification was carried out by personnel from EPA, NRCS, FWS, and the Vicksburg District. The EPA's field verification study report is included as Supplement A to Appendix 10. The 2000 Draft Report estimated that there were 48,500 acres of wetlands within the study area. The revised study estimates there are 189,600 acres of wetlands in the study area. The EPA independently estimated there were 216,000 acres of wetlands within the study area. The Vicksburg District estimate is restricted to wetlands sustained by backwater flooding, while the EPA estimates wetlands sustained by all sources. The nonstructural component of the recommended plan will increase wetland functional value by 19.5 percent.

o. Comment, Page 27, No. 6c. The Corps mitigation analysis is wholly inadequate.

Response. The Final Report and FSEIS have been revised and clearly state that compensatory mitigation of 15,029 acres is included in the 55,600 acres of the nonstructural reforestation/conservation measures. The Vicksburg District will acquire 15,029 acres of compensatory mitigation prior to operation of the pump station.

The estimate that the Yazoo Backwater project would alter 200,000 acres of wetlands was based on an estimate of wetland extent using the 1989 Wetland Delineation Manual (89-WDM). In 1991, Congress instructed EPA and the Vicksburg District to use the 1987 Wetland Delineation Manual (87-WDM). The Final Report and FSEIS contain a revised Appendix 10 (Wetlands), which includes two new estimates of wetland extent based on the 87-WDM. The EPA and Vicksburg District independently estimated that the study area contained approximately 200,000 acres of wetlands (EPA, 216,000; Vicksburg District, 189,600). These two estimates are based on the assumption that backwater flooding is the sole source of water to sustain

wetlands, and that the 51 inches of annual precipitation would not sustain these wetlands. The EPA and ERDC jointly developed the HGM method that was used to determine impacts and mitigation requirements for wetlands. The EPA's estimate includes wetlands sustained by precipitation, headwater flooding and backwater flooding, while the Vicksburg District's estimate is restricted to those wetlands sustained by backwater flooding. The Vicksburg District estimated that 26,300 acres of wetlands would no longer be wetlands. An additional 40,900 acres would experience shorter duration of flooding, but would retain their wetland status. The baseline wetland functional capacity is 885,300 Functional Capacity Units (FCUs), and the net functional loss is 14,200 FCUs. This loss represents 1.6 percent of the baseline functional capacity.

The Vicksburg District has successfully reforested more than 27,000 acres of bottom-land hardwoods in the Mississippi Delta. The success of these reforestation efforts has been monitored and documented. In addition, ERDC is monitoring the restoration of wetland functions on these lands for the Vicksburg District. Initial results from the monitoring studies show that wetland functional value is recovering at the projected rate. The lands reforested under the nonstructural feature will be included in this monitoring program. The District will also monitor the land use of these mitigation tracts. Should this monitoring indicate a violation in the terms of the easement, the Vicksburg District will take the necessary action to regain voluntary compliance with the terms of the agreement or use legal actions, if necessary.

The Vicksburg District is committed to fulfilling all of its authorized mitigation requirements. The Vicksburg District has been criticized about mitigation timing in relation to mitigation requirements. The issue is not whether the Vicksburg District has completed mitigation requirements, but rather, is mitigation concurrent with project construction. The Vicksburg District's mitigation is concurrent with project construction (Appendix 1).

The mitigation plan contained in the Final Report and FSEIS is consistent with Regulatory Guidance Letter No. 02-2. Sections 2a, 2c, and 2d address a watershed-based approach; mitigation to replace functional losses to aquatic resources (including wetlands); and functional assessment, replacement, and accounting.

p. Comment, Page 32, No. 6d. The Corps' threatened and endangered species analysis is inadequate and the corps must formally consult with fish and wildlife on the pondberry before it may proceed and further with this project.

Response. The Vicksburg District has completed Section 7 formal consultation on the pondberry. The FWS determined that the project will not jeopardize the continued existence of the endangered plant pondberry. The Vicksburg District, in consultation with FWS, will also implement conservation and recovery measures, which include establishing two new pondberry populations and additional research in support of the pondberry recovery plan.

q. Comment, Page 33, No. 6e. The Corps has abjectly ignored the cumulative losses of wetlands and the cumulative impacts of significant hydrologic alternations in the project area.

Response. The Final Report and FSEIS, including several appendixes, address cumulative impacts.

r. Comment, Page 34, No. 6f. The Corps has not evaluated the human health, economic, and social impacts of increased pesticide use on minority and low-income communities in the project area as required by the Executive Order on environmental justice.

Response. The Final Report and FSEIS include discussions on environmental justice. The revised Appendix 16 (Water Quality) addresses concerns expressed about pesticide concentrations in the project area by citizens during a public meeting held on 9 November 2000.

s. Comment, Page 35, No. 6g. The Corps has not adequately evaluated the impacts on aquatic species and has failed entirely to evaluate the impacts on two entire classes of animals, amphibians, and reptiles.

Response. The extensive scoping and coordination with Federal and state agencies, various groups having an interest in the project, and the general public determined the resource categories to be evaluated in detail. Scientists at ERDC conducted the aquatic evaluation, utilizing FWS HEP. Guidance for their study efforts was provided by an HEP team, which included representatives from the Vicksburg District, FWS, and MDWFP. The HEP team determined which classes represented the study area.

t. Comment, Page 35, No. 6h. The Corps has not adequately evaluated the impacts on water quality.

Response. Revised water quality analysis fully evaluated potential impacts to impaired waters, including those with TMDLs. The analysis addressed potential impacts from construction and changes in hydrology and from benefits from reforestation of agricultural land. The Vicksburg District does not agree that the project will increase the use of pesticides. Both EPA and USDA agree that total pesticide usage in the United States over the last 20 years has remained relatively constant. This project will reduce the total acres of land in row crops and therefore, reduce pesticide usage in the study area. Overall, the project will reduce erosion and nonpoint source runoff and will improve wetland functions associated with sediment, pesticide, and nutrient removal on reforested land.

u. Comment, Page 35, No. 6i. The Corps analyses of air and noise impacts are inadequate.

Response. Air and noise impacts are addressed in Appendix 6 and the FSEIS.

v. Comment, Page 36, No. 6j. The draft SEIS fails to adequately consider a wholly nonstructural alternative.

Response. The final array considered four nonstructural alternatives.

w. Comment, Page 36, No. 6k. The draft SEIS fails to contain critical supporting documentation and data and is rife with inconsistencies and errors.

Response. The draft SEIS contained both minor inconsistencies in data and errors. The FSEIS has been revised as appropriate. Critical supporting documentation is presented in the FSEIS appendixes.

x. Comment, Page 36, No. 6l. The Corps is not considering public comment in a manner consistent with the requirements of NEPA.

Response. All public comments were considered. The Vicksburg District's responses to the comments are in Appendix 5.